

**REPUBLIC OF YEMEN**  
**Ministry of Higher Education and**  
**Scientific Research**  
**International Malaysian University**  
**Faculty of Medical Sciences**



الجمهورية اليمنية  
وزارة التعليم العالي والبحث العلمي  
الجامعة الماليزية الدولية  
كلية العلوم الطبية





## Pharmacy Bachelor program specification

1. Basic information on the program	
<b>Program name &amp; scientific degree awarded</b>	Pharmacy Bachelor
<b>The entity awarding the degree</b>	Medical sciences college
<b>The academic department responsible for the program</b>	Pharmacy department
<b>Other departments participating in the program</b>	Medical sciences College (Medical laboratory dept., applied medical sciences dept.), Computer sciences & IT College ( Computer sciences dept.,)
<b>Language of the study</b>	English
<b>The year of beginning the program (For new programs)</b>	-----
<b>Study order</b>	Obligatory attendance (minimum 75 %)
<b>Facility of program execution</b>	The university
<b>Study system</b>	Semester type - Credit hours
<b>Study duration</b>	5 academic years consisting of 10 academic semesters
<b>The profession for which the program prepares the students</b>	Pharmacy
<b>The levels intended for qualifications</b>	High school students
<b>Qualification required for admission</b>	High school certificate
<b>Required Qualification Score %</b>	70 %
<b>Other conditions</b>	Date of High school degree does not exceed 5 years.
<b>Program Coordinator</b>	

2. College mission and aims	
<b>MISSION</b>	
The college mission is to offer to its students a remarkable high education service in medical sciences that concerns with students` acquiring of scientific knowledge and skills that potentiate their capabilities to compete in work markets and make them a qualified medical staff able to lead and develop in medical work fields and creative and effective elements in their societies. The college also intends to contribute in progress of the medical scientific researches and to fulfill the community need to medical services.	
<b>AIMS</b>	
1. Raising & development of the medical high education and improvement of its outcomes	



2. Achieving superiority in academic , instructional and learning aspects of its Bachelor & postgraduate programs
3. Enhancing of the effectiveness of its teaching staff to augment the students` learning.
4. Potentiating the students` personal, social and academic development and their technological innovation to provide the community with capable medical staff able to offer high medical services.
5. Providing a safe, health and stable educational environment that encourages learning and creation in the college`s students and teaching staff.
6. Participation in accomplishing newer scientific additions for humanity knowledge in medical fields by supporting the scientific researches for the favor of the local, regional and international communities.
7. Augmenting of the relationship with the local, Arabic and international scientific institutions to improve the health states and solving the communities problems by supporting researches and providing consultation services.
8. Supporting the loyalty of the college`s graduates and also its academic and administrative staff.
9. Encouraging the graduates compliance to professional ethics and their commitment to their communities.
10. Best utilizing of its material and human resources for the favor of the learning and instructional processes in order to achieve its mission and objectives

### 3. Mission & aims of the academic department

<b>MISSION</b>
Pharmacy department intends to offer to its students a remarkable high education service in pharmaceutical sciences that concerns with students` acquiring of scientific knowledge and skills that potentiate their capabilities to compete in work markets and make them a qualified medical staff able to lead and develop in pharmacy-related work fields and creative and effective elements in their societies. The college also intends to contribute in progress of the pharmaceutical researches and to fulfill the community need to pharmaceutical services.
<b>AIMS</b>
Raising & developing of pharmacy high education and improvement of its outcomes .
2. Achieving superiority in academic , instructional and learning aspects of its

Bachelor & postgraduate pharmacy programs
3. Enhancement of the effectiveness of its teaching staff to augment the students` learning.
4. Potentiating of the students` personal, social and academic development and their technological innovation to provide the community with capable pharmacists able to offer high pharmaceutical services.
5. Providing a safe, health and stable educational environment that encourages learning and creation in the college`s students and teaching staff.
6. Participation in accomplishing newer scientific additions for humanity knowledge in pharmacy by supporting the scientific researches for the favor of the local, regional and international communities.
7. Augmentation of the relationship with the local, Arabic and international pharmaceutical institutions to improve medications and solving the communities problems by supporting researches and providing consultation services.
8. Supporting the loyalty of the graduates and also its academic and staff.
9. Encouragement of the graduates compliance to pharmacy professional ethics and their commitment to their communities.

<b>4. Program References</b>
<ul style="list-style-type: none"> <li>• Regulations provided by the Council for Accreditation &amp; Quality Assurance– Ministry of High education &amp; scientific research, Yemen.</li> <li>• Criteria of the Canadian Council for Accreditation of Pharmacy programs "CCAPP" , 2013</li> <li>• Similar Pharmacy BC programs awarded by regional and international universities and have been accredited by CCAPP, including :             <ul style="list-style-type: none"> <li>○ King Saud university, Saudi Arabia</li> <li>○ Qatar University, Qatar</li> <li>○ Beirut University, Lebanon</li> <li>○ Pharma Alberta university , USA</li> </ul> </li> </ul>



## 5. Program mission

### MISSION

The program intends to offer remarkable curriculum in pharmacy characterized with modernity and comprehension and focusing on development of both the knowledge and skill aspects of students in order to ensure graduation of highly qualified pharmacists who are able to provide high pharmaceutical services to their communities.

## 6. Program AIMS

1. Providing the students with scientific knowledge in basic sciences and pharmaceutical sciences including the modern ones that are essential to realize their duties and activities as pharmacists .

2. Developing the intellectual, professional and practical skills of the students to make them able to perform all types of pharmacy-related works.

Enhancing the transferable skills of the students to perform pharmacy profession with respect to their colleagues, patients and community and in compliance to the profession ethics and laws

## 7. Basic Intended learning outcomes of the program

**At the end of this program, the graduates shall have been able to :**

ILOs of knowledge & understanding	Recognize the scientific principles and technologies needed for practicing of pharmacy profession.
ILOs of intellectual skills	Analyze, apply, synthesize and evaluate information and concepts in various pharmacy –related works.
ILOs of practical & professional skills	Practice pharmacy-related works safely and effectively.
ILOs of transferable skills	Influence positively in team work and consider ethics & laws during practicing of his/her profession& commit to serve patients & community

<b>8. Curriculum map</b> <b>( Subsidiary Program Intended learning outcomes (PILOs) )</b>
<b>PILOs of knowledge &amp; understanding</b>
<b>A1.</b> Recognizethe structural and functional units as well as the biological processes in human body and the factors influencing human health.
<b>A2.</b> Explain the physicochemical properties & biological influences of matters (including chemicals, biochemical, drugs, dosage forms, products, etc.) he /she will deal during practicing of pharmacy profession .
<b>A3.</b> Discuss the basic, modern and advanced concepts, principles and technologies applied in various works related to pharmacy profession.
<b>A4.</b> Realize the missions , duties, carriers, organization, laws and opportunities related to his/her profession.
<b>PILOs of intellectual skills</b>
<b>B1.</b> Employ ideas & concepts to interpret phenomena and express information related to pharmacy works
<b>B2.</b> Analyze various pharmacy- related information.
<b>B3.</b> Integrate information to compose ideas and concepts applied in pharmacy practice.
<b>B4.</b> Evaluate different data and information encountered during his/her practicing of pharmacy in order to conclude a fact and take the appropriate decision .
<b>PILOs of practical &amp; professional skills</b>
<b>C1.</b> Proficiently handle, operate & run different tools, instruments, equipments and machine involved in pharmacy works.
<b>C2.</b> Perform effectively, the missions related to his/her profession using standard procedures at different pharmacy-work fields including laboratories, drug plants, research & development centers, quality control departments and hospital, clinical and community pharmacies.
<b>C3.</b> Take the required safety criteria during performing different types of pharmacy works.
<b>C4.</b> Use, capably, language, media, data and information sources to present his/her thoughts/ideas and to search for the scientific facts associated with pharmacy profession.
<b>PILOs of Transferable skills</b>
<b>D1.</b> Share successfully in team-work.
<b>D2.</b> Show respect to life and commit to community and patients serving.



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**D3.** Communicate effectively with his/her colleagues, members of health care team, patients and community.

**D4.** Comply to pharmacy laws and ethics and behave in discipline during practicing pharmacy works.

**D5.** Demonstrate time management during practicing of different works related to his/her profession

No.	Courses (as ordered in the study plan)	Subsidiary PILOs																
		A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4	D5
1.	Arabic language											√				√		
2.	English language			√			√					√				√		
3.	Computer skills	√				√						√						√
4.	Islamic culture	√			√	√									√			
5.	Introduction to pharmacy profession				√		√	√				√		√			√	
6.	General biology	√	√	√			√	√		√	√	√		√	√	√	√	√
7.	General chemistry		√	√		√	√	√		√	√	√		√		√	√	√
8.	Communication skills		√	√	√	√	√	√				√	√					√
9.	Physics		√	√		√	√	√	√	√	√	√		√		√	√	√
10.	Mathematics			√		√	√	√	√	√	√			√				√
11.	English for Medical Purposes			√		√						√						
12.	Organic Chemistry		√	√		√	√	√		√	√	√		√		√	√	√
13.	Anatomy and histology		√			√				√								
14.	Drug discovery & development		√	√	√	√	√	√				√	√				√	√
15.	Physical pharmacy		√	√	√	√	√	√	√	√	√	√	√	√		√	√	√
16.	Psychology	√		√	√		√		√			√	√	√	√			
17.	Physiology I	√	√			√	√		√			√	√	√				
18.	Pharmaceutical Organic Chemistry		√	√	√	√	√	√	√	√	√	√	√	√		√	√	√
19.	Medical Biochemistry	√	√	√		√	√	√		√	√	√	√	√	√	√	√	√
20.	Botany	√	√				√			√	√	√	√	√	√	√	√	√
21.	Pharmaceutical calculations skills				√	√	√		√		√			√	√		√	√
22.	Physiology II	√	√			√	√		√			√	√	√				
23.	Pharmaceutics I		√	√	√	√	√	√	√	√	√	√	√	√		√	√	√
24.	Pharmaceutical Analytical Chemistry			√	√		√		√	√	√	√	√	√		√	√	√
25.	Pharmacognosy I	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
26.	Pharmaceutical Microbiology	√	√		√	√	√		√	√	√	√	√	√	√	√	√	√

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27.	Pathology	√				√	√		√				√	√	√	√		√
28.	Medicinal chemistry I		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
29.	Pharmacology I		√		√		√	√	√	√	√			√	√			√
30.	Medicinal Chemistry II		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
31.	Pharmaceutics II		√	√	√	√	√	√	√	√	√	√	√		√	√	√	√
32.	Medical parasitology	√	√			√	√			√	√	√	√	√	√	√	√	
33.	Pharmacology II		√		√		√	√	√	√	√			√	√			√
34.	Pharmacognosy II	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
35.	Pathophysiology	√				√	√		√				√	√	√	√		√
36.	Pharmaceutical instrumental analysis I		√	√	√	√	√		√	√	√	√	√		√	√		√

No.	Courses (As ordered in the study plan)	Subsidiary ILOs																
		A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4	D5
37	Phytochemistry I	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
38	Pharmacology III		√		√		√	√	√	√	√			√	√			√
39	Pharmaceutics III		√	√	√	√	√	√	√	√	√	√	√	√		√	√	√
40	Pharmacotherapy I	√	√	√	√		√	√	√		√		√	√	√	√	√	√
41	Pharmaceutical Instrumental analysis II		√	√	√	√	√		√	√	√	√	√		√	√		√
42	Medicinal Chemistry III		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
43	Clinical pharmacy I			√	√	√		√			√		√	√	√	√	√	√
44	Integrated- case based learning I				√	√	√	√	√		√		√	√	√	√		√
45	Pharmaceutical instrumental analysis III		√	√	√	√	√		√	√	√	√	√		√	√		√
46	Cosmetic Preparations		√	√	√	√	√	√	√	√	√	√	√	√		√	√	√
47	Phytochemistry II	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
48	Clinical pharmacy II			√	√	√		√	√		√		√	√	√	√		√
49	Pharmacotherapy II	√	√	√	√		√	√	√		√		√	√	√	√	√	√
50	Integrated- case based learning II				√	√	√	√	√		√		√	√	√	√		√
51	Experimental Pharmacology	√	√	√	√	√	√		√	√	√	√	√	√	√	√	√	√
52	Advanced drug delivery systems	√	√	√	√		√		√				√	√	√	√	√	√
53	Industrial pharmacy		√	√	√	√	√	√	√				√	√			√	√
54	Complementary and alternative medicine	√	√	√	√		√	√	√		√		√	√	√		√	√
55	Pharmacy Training I (250 Training Hours)									√	√	√	√	√	√	√	√	√
56	Pharmaceutical Quality Control		√	√	√	√	√		√	√	√	√	√	√		√	√	√
57	Biopharmaceutics		√	√	√	√	√		√		√		√	√	√	√	√	√
58	Hospital pharmacy		√	√	√	√	√	√	√		√		√	√	√	√	√	√
59	Toxicology	√	√		√		√	√	√		√		√	√	√	√		√
60	Pharmaceutical Biotechnology	√	√	√	√	√	√		√				√	√	√	√		√
61	Biostatistics			√		√	√	√	√	√	√			√				√
62	Research methodology and presentation		√	√			√				√	√	√	√	√	√	√	√



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		A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4	D5
	skills																	
63	Pharmacy Practice skills		√	√	√	√			√		√		√	√	√	√	√	√
64	Pharmacogenomics and gene therapy	√	√	√	√	√	√		√				√	√	√	√	√	
65	Pharmacy Training II (250 Training Hours)										√		√	√	√	√	√	√
66	Pharmacokinetics			√	√	√	√		√	√	√		√	√				√
67	Radiopharmacy	√	√	√	√	√	√		√				√	√	√	√	√	
68	Pharmacoeconomics			√		√	√	√	√	√	√			√				√
69	Public health and First aid	√		√	√		√	√					√	√	√	√	√	√
70	Professional ethics and regulations	√		√	√		√	√					√	√	√	√	√	√
71	Pharmaceutical Marketing			√	√		√					√	√	√	√	√		√
72	Graduation research Project					√	√	√	√		√		√	√	√	√		√

9. Teaching strategies		
Teaching strategy	When to be used ?	Total Courses\ Credit hours
<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>	Used in most courses	66 courses(168 credit hours)
<p><b>lecture – Discussion / Tutorial</b>: a short lecture/ address followed by discussion</p>	Used in most courses whenever necessary in particular courses of " <b>Mathematics , Physics , pharmacokinetics, pharmaceutical calculation skills, biostatistics</b> ", "English" , "English for medical purposes" .	66 courses( 168 credit hours)
<p><b>Seminars</b>: these are mainly used with small groups of students (20-30) students in which they find better chances for discussing and participating in the teaching process.</p>	Used in courses " <b>integrated-case based learning I</b> " &" <b>integrated-case based learning II</b> , " <b>research methodology and presentation skills</b> "	3 courses of total of 72 courses ( 5 credit hours )
<p><b>IT laboratory sessions</b>: average number of students in session(20-30)students</p>	Used in " computer skills" course	1 course of total of 72 courses (3 credit hour )
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small</p>	Used in courses including practical parts e.g. <b>pharmaceutics, pharmacognosy</b> etc.	32 courses , 32 credit hours (62 actual hours)

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groups		
<b>Feed-back learning:</b> students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation	Used in most courses whenever necessary in particular when assignment and practical works are employed in the courses.	<b>66</b> courses( <b>168</b> credit hours)
<b>Group projects:</b> students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills	Used in " <b>integrated-case based learning I</b> " &" <b>integrated-case based learning I I</b> "courses, " <b>Graduation research project</b> " courses.	<b>3</b> courses ( <b>8</b> credit hours)
<b>Field training:</b> each 2-3 students are commissioned to do certain assignments in a real field entity such as drug factory, hospitals, pharmacies under supervision of both the field principle and an academic supervisor	Used in " <b>pharmacy training I</b> " and in " <b>pharmacy training II</b> " courses	<b>2</b> courses ( <b>4</b> credit hours ) = 500 actual hours)

## 10. Students Assessment strategies

### Assessment Rules

- (i) No students is allowed to enter the final exam unless he/she has attended at least 75 % of the total number of course lectures/practical sessions.
- (ii) For courses that involve practical parts, the student will not pass the course unless he/she passes both theoretical and practical course parties
- (iii) The student will not pass the course unless he/she gain theoretical and practical course parties
- (iv)The minimum pass degree in the final theoretical exam is 30 % of the estimation weight of the exam.
- (v) The minimum pass degree in the final practical exam is 30 % of the estimation weight of the exam.
- (vi)The student will pass the course if he/she gains at least 50 % of the total the estimation weight of the course.

### Assessment Methods

Assessment method	Description & courses
Written exam	<ul style="list-style-type: none"> <li>• Will be used in most courses</li> <li>• Closed-book pattern</li> <li>• It is the form of the final exam of theoretical part</li> <li>• It is the form of the mid-semester exam of theoretical part</li> <li>• It can also be used for Exam of theory-practice</li> </ul>
Quiz	<ul style="list-style-type: none"> <li>• A predefined timed brief questions will be asked to be answered by the students most likely in the form of written exam</li> </ul>
Practical exam	<ul style="list-style-type: none"> <li>• Will be used in courses including practical parts.</li> <li>• It is the form of the final exam of practice all part</li> <li>• In this method, the student will be asked to perform an experiment and deliver the result to the teacher</li> </ul>

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Oral exam	<ul style="list-style-type: none"> <li>• It can be used in courses involving practical parts e.g. "General chemistry" for Exam of theory-practice</li> <li>• Will be used in used in " Pharmacy training " courses where a specialized committee will implement the exam.</li> </ul>
Assignments	<ul style="list-style-type: none"> <li>• The student will be assigned to do homework paper, search, charts etc related to the course topics</li> <li>• Used in most courses</li> </ul>
Attendance	<ul style="list-style-type: none"> <li>• Will be used in all courses</li> <li>• Students will be informed that no one will attend the final exams unless he/she attends at least 75 % of the lectures and lab. practices (if any)</li> <li>• Attendance degree will be based on the number of the lectures / lab. sections the student has attended.</li> </ul>
Lab. accomplishment	<ul style="list-style-type: none"> <li>• Will be used in courses including practical parts</li> <li>• The student will be given a weekly mark from the teacher based on his/her accomplishment of each experiment in the laboratory.</li> <li>• The total marks will be converted into an average</li> </ul>
Reporting	<ul style="list-style-type: none"> <li>• Will be used in courses including practical parts and also courses related to filed training</li> <li>• A predefined template will be asked to filled by the student</li> </ul>
Attitude	<ul style="list-style-type: none"> <li>• Will be used in courses including practical parts and also courses related to filed training and graduation project courses</li> <li>• The mark is based on the participation of the student in team-work and his/her compliance to standard procedures during practical work, field-training and graduation project</li> <li>• Teachers of the lab. practice will instruct students of to follow standard procedures for safety lab works. Teachers will also inform students that they will evaluate their lab. attitude.</li> </ul>
Integrated –case base learning " seminar: assessment	<ul style="list-style-type: none"> <li>• 10 % of the assessment will be for attendance</li> <li>• 40 % of the course degree will be based on seminar assessment ( including presentation, solving case and discussion)</li> <li>• 50 % of the course degree will be based on written exam</li> </ul>
Pharmacy field-training assessment	<ul style="list-style-type: none"> <li>• 40 % of the course degree will be based on attendance, attitude and reporting and implanted by the training supervisor</li> <li>• 60 % of the course degree will be based on oral exam implemented by specialized committee.</li> </ul>
Graduation research project assessment	<ul style="list-style-type: none"> <li>• 40 % of the course degree will be implanted for each student by the project supervisor based on attendance and attitude</li> <li>• 60 % of the course degree will be implanted by a specialized committee for the whole students of the project based on research methodology, writing, presentation and discussion</li> </ul>

More details of assessment method are shown below

**1. For courses involving only theoretical part**

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment %
1	Attendance	1 - 15	5	5
2	Assignments (1 + 2)	4-13 , 14	10	10
3	Quiz 1 + Quiz 2	7, 12	5	5
4	Mid-semester exam of theoretical part ( written exam)	7	20	20
5	Final exam of theoretical part ( written exam)	16	60	60
TOTAL			100	100 %

**2. For courses involving both theoretical and practical parts**

Theoretical part assessment				
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment
1	Attendance	1 - 15	2	2.5
2	Assignments (1 + 2)	4-13, 14	5	5
3	Quiz 1 + Quiz 2	7, 12	3	2.5
4	Mid-semester exam of theoretical part ( written exam)	7	10	10
5	Final exam of theoretical part ( written exam)	16	40	40
TOTAL			60	60 %

Practical part assessment				
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment
1	Lab. Attendance	Weekly	5	5
2	Lab. Attitude	weekly	2	2
3	Lab. Accomplishments	weekly	5	5
4	Reporting	weekly	3	3
5	Exam of practice theory (written exam or oral exam)	14	5	5



6	Practical exam (practical)	14	20	20
Total			40	40 %

### 3. Pharmacy Field training assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment
1	Attendance ( by the supervisor)	weekly	10	10 %
2	Attitude (by the supervisor)	weekly	10	10 %
3	Reporting (by the supervisor)	12th week	10	10 %
4	Task accomplishment (by the supervisor)	13th week	20	20 %
5	Final Committee exam * : Oral exam	16th week	50	50 %
TOTAL			100	100 %

\* : A committee of three of the teaching staff including the supervisor of the training.

The marks of the committee exam are divided as follows:

Item	Mark
supervisor	10
Committee member 1	20
Committee member 1	20

### 5. Assessment of seminar-involved courses (Integrated-Case base learning courses)

Items	Weight
Attendance	10 %
Seminar assessment	30 %
Final written exam	60 %
<b>Total</b>	<b>100</b>

**The seminar** weight will be assessed (for the students group as one unit) as follows:

Items	Weight
Presentation	10 %
Solving of the Case study questions	10 %

Discussion	10 %
<b>Total</b>	<b>30 %</b>

#### 4. Graduation project assessment

Each project will be assessed by a committee of three member as follows

Items	Weight
Project supervisor	70 %
Internal examiner : a member of the department teaching stuff.	15 %
external examiner : a qualified external examiner (either from other departments of the college or from another university)	15 %
<b>Total</b>	<b>100</b>

Assessment of the project by the project supervisor	
Items	Mark
Attendance	35
Attitude and collaboration	35
<b>Total</b>	<b>70</b>

Assessment of the project by the internal examiner	
Items	Mark <sup>1</sup>
Research methodology	5
Research writing	5
Presentation	2
Discussion	3
<b>Total</b>	<b>15</b>

<sup>1</sup>: The whole students team of the projects will be assessed as one unit

Assessment of the project by the external examiner	
Items	Mark <sup>1</sup>
Research methodology	5
Research writing	5
Presentation	2
Discussion	3
<b>Total</b>	<b>15</b>

<sup>1</sup>: The whole students team of the projects will be assessed as one unit

## Description of grades

<b>Table of grades description</b>	
<b>Grade percentage %</b>	<b>Description</b>
<b>95 – 100 %</b>	<b>Excellent +</b>
<b>90 – 94 %</b>	<b>Excellent</b>
<b>85- 89 %</b>	<b>Very good +</b>
<b>80- 84 %</b>	<b>Very Good</b>
<b>75- 79 %</b>	<b>Good +</b>
<b>70- 74 %</b>	<b>Good</b>
<b>50 – 69 %</b>	<b>Pass</b>

- Grade percentage with fractions greater than or equal 0.5 will be raised directly to the higher grade
- The Table of grades description is used to describe course grade, semester grades , annual grades and overall grade

### **1. Semester Grades %**

- Credit Course grade = courses grade percentage x credit hours of the course
- Semester grade % = cumulative credit courses degrees in the semester / total credit hours of the semester courses

### **2. Annual Grades%**

Annual grade % = cumulative credit courses grades in the two semesters of the year / total credit hours of courses in the two semesters of the year.

### **3. Overall Grade %**

Overall grade = cumulative credit courses grades in the five years / 193  
 Where, 193 is the total credit hours of courses in the five years of the study

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### Credit academic Hours

Academic year	Credit hours		
	First semester	Second semester	Annual
	Total	Total	Total
1 <sup>st</sup>	19	20	39
2 <sup>nd</sup>	19	24	43
3 <sup>rd</sup>	21	22	43
4 <sup>th</sup>	18	19	40
5 <sup>th</sup>	19	12	29
Total	<b>96</b>	<b>97</b>	<b>193</b>

<b>11. Study system&amp; Courses</b>	
<b>Study Type and duration</b>	Semester-based ; 5 academic years (levels), 10 academic semesters ; each semester is composed of 16 weeks (including exams periods).
<b>Total credit hours to accomplish the study</b>	193
<b>Distribution of the total study credit hours</b>	
<b>Requirements</b>	<b>Number of courses and credit hours and their %</b>
University requirement	4 courses ; 11 credit hours ( <b>5.7 %</b> )
College requirements	14 courses ; 38 credit hours ( <b>19.7 %</b> )
Academic department requirements (essential requirements)	7 courses ; 7 credit hours ( <b>3.6 %</b> )
Academic department requirements (General Obligatory Specialty requirements)	47 courses ; 133 credit hours ( <b>68.9 %</b> )
Academic department requirements (Field training - Obligatory Specialty requirements)	2 courses ; 4 credit hours ( 500 actual hours) ( <b>2.1 %</b> )
Academic department requirements )(optional Specialty requirements	None
<b>Total</b>	72 courses ; 193 credit hours



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### 1. Courses required by the university

No.	Code	Course	Credit hours
1.	IMU 01	Arabic language	2
2.	IMU 02	English language	4
3.	IMU 03	Computer skills	3
4.	IMU 04	Islamic culture	2
<b>Total</b>			<b>11</b>

### 2. Courses required by the College

No.	Code	Course	Credit hours
1.	MSC 01	General Biology	3
2.	MSC 02	General chemistry	3
3.	MSC 03	Communication skills	2
4.	MSC 04	Physics	3
5.	MSC 05	English for medical purposes	4
6.	MSC 06	Anatomy and histology	3
7.	MSC 07	Psychology	2
8.	MSC 08	Physiology	2
9.	MSC 09	Medical biochemistry	3
10.	MSC 10	Pathology	2
11.	MSC 11	Biostatistics	2
12.	MSC 12	Research methodology and presentation skills	3
13.	MSC 13	Professional ethics and regulations	2
14.	MSC 14	Graduation Research Project	4
<b>Total</b>			<b>38</b>

### 3. Courses required by the Department

#### a. Essential courses

No.	Code	Course	Credits hours
1.	PHRE 01	Mathematics	2
2.	PHRE 02	Medical parasitology	3

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3.	PHRE 03	Public health and first aid	2
<b>Total</b>			<b>7</b>

**b. Specialty courses (1): obligatory courses**

No.	Code	Course	Credits hours
<b>Pharmaceutics and Pharmacy practice courses</b>			
1.	PHRT 01	Introduction to pharmacy profession	2
2.	PHRT 02	Physical pharmacy	3
3.	PHRT 03	Pharmaceutical calculations skills	2
4.	PHRT 04	Pharmaceutics I	3
5.	PHRT 05	Pharmaceutical microbiology	3
6.	PHRT 06	Pharmaceutics II	3
7.	PHRT 07	Pharmaceutics III	3
8.	PHRT 08	Clinical pharmacy I	2
9.	PHRT 09	Integrated- case based learning I	2
10.	PHRT 10	Cosmetic preparations	3
11.	PHRT 11	Clinical pharmacy II	2
12.	PHRT 12	Integrated- case based learning II	2
13.	PHRT 13	Advanced drug delivery systems	3
14.	PHRT 14	Industrial pharmacy	3
15.	PHRT 16	Pharmaceutical Quality control	3
16.	PHRT 17	Biopharmaceutics	2
17.	PHRT 18	Hospital pharmacy	2
18.	PHRT 19	Pharmaceutical biotechnology	2
19.	PHRT 20	Pharmacy practice skills	3
20.	PHRT 22	Pharmacokinetics	3
21.	PHRT 23	Radiopharmacy	2
22.	PHRT 24	Pharmacoeconomics	2
23.	PHRT 25	Pharmaceutical marketing	2
		<b>Total</b>	<b>57</b>
<b>Medicinal chemistry and related courses</b>			
24.	PHRM 01	Organic chemistry	4
25.	PHRM 02	Drug Discovery and Development	2
26.	PHRM 03	Pharmaceutical Organic chemistry	4
27.	PHRM 04	Pharmaceutical analytical chemistry	4
28.	PHRM 05	Medicinal chemistry I	4
29.	PHRM 06	Medicinal chemistry II	4
30.	PHRM 07	Pharmaceutical instrumental analysis I	3
31.	PHRM 08	Pharmaceutical instrumental analysis II	3
32.	PHRM 09	Medicinal chemistry III	4
33.	PHRM 10	Pharmaceutical instrumental analysis III	3

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		Total	35
<b>Pharmacognosy and related courses</b>			
34.	PHRG 01	Botany	3
35.	PHRG 02	Pharmacognosy I	3
36.	PHRG 03	Pharmacognosy II	3
37.	PHRG 04	Phytochemistry I	3
38.	PHRG 05	Phytochemistry II	3
39.	PHRG 06	Complementary and alternative medicine	2
		Total	17
<b>Pharmacology and related courses</b>			
40.	PHRC 01	Physiology II	2
41.	PHRC 02	Pharmacology I	3
42.	PHRC 03	Pathophysiology	2
43.	PHRC 04	Pharmacology II	3
44.	PHRC 05	Pharmacology III	3
45.	PHRC 06	Pharmacotherapy I	2
46.	PHRC 07	Pharmacotherapy II	2
47.	PHRC 08	Experimental pharmacology	3
48.	PHRC 09	Toxicology	2
49.	PHRC10	Pharmacogenomics and gene therapy	2
		Total	24
		<b>Overall Total</b>	123

**b. Specialty courses (2) : field training**

No.	Code	Course	Credits hours
50.	PHRT 20	Pharmacy Training I (250 Training Hours)	2
51.	PHRT 24	Pharmacy Training II (250 Training hours)	2
		Total	4

Code	Meaning
IMU	Courses required by International Malaysian University
MSC	Courses required by Medical Sciences College
PHR	Courses required by Pharmacy department
PHRE	Essential Courses required by Pharmacy department
PHRC	Specialty Courses required by Pharmacy department (Pharmacology and related courses)
PHRG	Specialty Courses required by Pharmacy department (Pharmacognosy and related courses)

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## 1. Study plan

PHRM	Specialty Courses required by Pharmacy department (Medicinal chemistry and related courses)
PHRT	Specialty Courses required by Pharmacy department (Pharmaceutics and related courses)

FIRST YEAR (1 <sup>st</sup> semester)										
No.	Course	Code	Course Type	Credit hours						Course awarded by
				Theoretical			P	Tr	Total	
				L	Tut.	S				
1.	Arabic language	YMU01	university	2	-	-	-	-	2	Phar. Dept.
2.	English language	YMU 02	university	2	2	-	-	-	4	Phar. Dept.
3.	Computer skills	YMU 03	university	2	-	-	1	-	3	Comp. Sc. Dept.
4.	Islamic culture	YMU 04	university	2	-	-	-	-	2	Phar. Dept.
5.	Introduction to pharmacy profession	PHRT 01	Specialty	2	-	-	-	-	2	Phar. Dept.
6.	General Biology	MSC 01	College	2	-	-	1	-	3	Phar. Dept.
7.	General chemistry	MSC 02	College	2	-	-	1	-	3	Phar. Dept.
<i>Total</i>				14	2	-	3	-	19	

FIRST YEAR ( 2 <sup>nd</sup> semester )										
No.	Course	Code	Course Type	Credit hours						Course awarded by
				Theoretical			P	Tr	Total	
				L	Tut.	S				
1.	Communication skills	MSC 03	College	1	1	-	-	-	2	Phar. Dept.
2.	Physics	MSC 04	College	1	1	-	1	-	3	APP. Med. Sc. Dept.
3.	Mathematics	PHRE 01	Essential	1	1	-	-	-	2	Computer Sc. Dept.
4.	English for Medical Purposes	MSC 05	College	2	2	-	-	-	4	APP. Med. Sc. Dept.
5.	Organic Chemistry	PHRM 01	Specialty	3	-	-	1	-	4	Phar. Dept.
6.	Anatomy and histology	MSC 06	College	2	-	-	1	-	3	APP. Med. Sc. Dept.
7.	Drug Discovery and Development	PHRM 02	Specialty	2	-	-	-	-	2	Phar. Dept.
<i>Total</i>				12	5	-	3	-	20	



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<b>Second YEAR (1<sup>st</sup> semester)</b>										
No.	Course	Code	Course type	Credit hours						Course awarded by
				Theoretical			P	Tr	Total	
				L	Tut.	S				
1.	Physical pharmacy	PHRT 02	Specialty	1	1	-	1	-	3	Phar. Dept.
2.	Psychology	MSC 07	College	2	-	-	-	-	2	Phar. Dept.
3.	Physiology I	MSC 08	College	2	-	-	-	-	2	Comp. Sc. Dept.
4.	Pharmaceutical Organic Chemistry	PHRM 03	Specialty	3	-	-	1	-	4	Phar. Dept.
5.	Medical Biochemistry	MSC 09	College	2	-	-	1	-	3	Phar. Dept.
6.	Botany	PHRG 01	Specialty	2	-	-	1	-	3	Phar. Dept.
7.	Pharmaceutical calculations skills	PHRT 03	Specialty	1	1	-	-	-	2	Phar. Dept.
<i>Total</i>				13	2	-	4	-	19	

<b>Second YEAR (2<sup>nd</sup> semester)</b>										
No.	Course	Code	Course type	Credit hours						Course awarded by
				Theoretical			P	Tr	Total	
				L	Tut.	S				
1.	Physiology II	PHRC 01	Specialty	2	-	-	-	-	2	Phar. Dept.
2.	Pharmaceutics I	PHRT 04	Specialty	2	-	-	1	-	3	Phar. Dept.
3.	Pharmaceutical Analytical Chemistry	PHRM 04	Specialty	2	1	-	1	-	4	Phar. Dept.
4.	Pharmacognosy I	PHRG 02	Specialty	2	-	-	1	-	3	Phar. Dept.
5.	Pharmaceutical Microbiology	PHRT 05	Specialty	2	-	-	1	-	3	Phar. Dept.
6.	Pathology	MSC 10	College	2	-	-	-	-	2	APP. Med. Sc. Dept
7.	Medicinal chemistry I	PHRM 05	Specialty	3	-	-	1	-	4	Phar. Dept.
8.	Pharmacology I	PHRC 02	Specialty	3	-	-	-	-	3	

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<i>Total</i>	18	1	-	5	-	24
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<b>Third YEAR (1<sup>st</sup> semester)</b>										
No.	Course	Code	Course type	Credit hours						Course awarded by
				Theoretical			P	Tr	Total	
				L	Tut.	S				
1.	Medicinal Chemistry II	PHRM 06	Specialty	3	-	-	1	-	4	Phar. Dept.
2.	Pharmaceutics II	PHRT 06	Specialty	2	-	-	1	-	3	Phar. Dept.
3.	Medical parasitology	PHRE 02	Essential	2	-	-	1	-	3	Med. Lab. Dept.
4.	Pathophysiology	PHRC 03	Specialty	2	-	-	-	-	2	Phar. Dept.
5.	Pharmacognosy II	PHRG 03	Specialty	2	-	-	1	-	3	Phar. Dept.
6.	Pharmacology II	PHRC 04	Specialty	3	-	-	-	-	3	Phar. Dept.
7.	Pharmaceutical instrumental analysis I	PHRM 07	Specialty	2	-	-	1	-	3	Phar. Dept.
<i>Total</i>				16	-	-	5	-	21	

<b>Third YEAR (2<sup>nd</sup> semester)</b>										
No.	Course	Code	Course type	Credit hours						Course awarded by
				Theoretical			P	Tr	Total	
				L	Tut.	S				
1.	Phytochemistry I	PHRG 04	Specialty	2	-	-	1	-	3	Phar. Dept.
2.	Pharmacology III	PHRC 05	Specialty	3	-	-	-	-	3	Phar. Dept.
3.	Pharmaceutics III	PHRT 07	Specialty	2	-	-	1	-	3	Phar. Dept.
4.	Pharmacotherapy I	PHRC 06	Specialty	2	-	-	-	-	2	Phar. Dept.
5.	Pharmaceutical Instrumental analysis II	PHRM 08	Specialty	2	-	-	1	-	3	Phar. Dept.
6.	Medicinal Chemistry III	PHRM 09	Specialty	3	-	-	1	-	4	Phar. Dept.
7.	Clinical pharmacy I	PHRT 08	Specialty	2	-	-	-	-	2	Phar. Dept.
8.	Integrated- case based learning I	PHRT 09	Specialty	-	-	2	-	-	2	

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<i>Total</i>	16	-	2	4	-	22
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<b>Fourth YEAR (1<sup>st</sup> semester)</b>										
No.	Course	Code	Course type.	Credit hours						Course awarded by
				Theoretical			P	Tr	Total	
				L	Tut.	S				
1.	Pharmaceutical instrumental analysis III	PHRM 10	Specialty	2	-	-	1	-	3	Phar. Dept.
2.	Cosmetic Preparations	PHRT 10	Specialty	2	-	-	1	-	3	Phar. Dept.
3.	Phytochemistry II	PHRG 05	Specialty	2	-	-	1	-	3	Phar. Dept.
4.	Clinical pharmacy II	PHRT 11	Specialty	2	-	-	-	-	2	Phar. Dept.
5.	Pharmacotherapy II	PHRC 07	Specialty	2	-	-	-	-	2	Phar. Dept.
6.	Integrated- case based learning II	PHRT 12	Specialty	-	-	2	-	-	2	Phar. Dept.
7.	Experimental Pharmacology	PHRC 08	Specialty	2	-	-	1	-	3	Phar. Dept.
<i>Total</i>				12	-	2	4	-	18	

<b>Fourth YEAR (2<sup>nd</sup> semester)</b>										
No.	Course	Code	Course type	Credit hours						Course awarded by
				Theoretical			P	Tr	Total	
				L	Tut.	S				
1.	Advanced drug delivery systems	PHRT 13	Specialty	3	-	-	-	-	3	Phar. Dept.
2.	Industrial pharmacy	PHRT 14	Specialty	3	-	-	-	-	3	Phar. Dept.
3.	Complementary and alternative medicine	PHRG 06	Specialty	2	-	-	-	-	2	Phar. Dept.
4.	Pharmacy Training I (250 Training Hours)	PHRT 15	Specialty	-	-	-	-	2	2	Phar. Dept.
5.	Pharmaceutical Quality Control	PHRT 16	Specialty	2	-	-	1	-	3	Phar. Dept.
6.	Biopharmaceutics	PHRT 17	Specialty	2	-	-	-	-	2	Phar. Dept.
7.	Hospital pharmacy	PHRT 18	Specialty	2	-	-	-	-	2	

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8.	Toxicology	PHRC 09	Specialty	2	-	-	-	-	2	
<i>Total</i>				16	-	-	1	2	19	

<b>Fifth YEAR (1<sup>st</sup> semester)</b>										
No.	Course	Code	Course Type	Credit hours						Course awarded by
				Theoretical			P	Tr	Total	
				L	Tut.	S				
1.	Pharmaceutical Biotechnology	PHRT 19	Specialty	2	-	-	-	-	2	Phar. Dept.
2.	Biostatistics	MSC 11	College	1	1	-	-	-	2	Phar. Dept.
3.	Research methodology and presentation skills	MSC 12	College	2	-	1	-	-	3	Phar. Dept.
4.	Pharmacy Practice skills	PHRT 20	Specialty	2	-	-	1	-	3	
5.	Pharmacogenomics and gene therapy	PHRC 10	Specialty	2	-	-	-	-	2	Phar. Dept.
6.	Pharmacy Training II (250 Training Hours)	PHRT 21	Specialty	-	-	-	-	2	2	Phar. Dept.
7.	Pharmacokinetics	PHRT 22	Specialty	2	1	-	-	-	3	
8.	Radiopharmacy	PHRT 23	Specialty	2	-	-	-	-	2	
<i>Total</i>				13	2	1	1	2	19	

<b>Fifth YEAR (2<sup>nd</sup> semester)</b>										
No.	Course	Code	Course type	Credit hours						Course awarded by
				Theoretical			P	Tr	Total	
				L	Tut.	S				
1.	Pharmacoeconomics	PHRT 24	Specialty	2	-	-	-	-	2	Phar. Dept.
2.	Public health and First aid	PHRE 03	Essential	2	-	-	-	-	2	Phar. Dept.
3.	Professional ethics and regulations	MSC 13	College	2	-	-	-	-	2	Phar. Dept.
4.	Pharmaceutical Marketing	PHRT 25	Specialty	2	-	-	-	-	2	Phar. Dept.
5.	Graduation research Project	MSC 14	College	-	1	-	3	-	4	Phar. Dept.
<i>Total</i>				8	1	-	3	-	12	



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Academic year	Credit hours												
	First semester						Second semester						Annual Total
	Theoretical			P	TR.	Total	Theoretical			P	TR	Total	
	L	Tut	S				L	Tut	S				
1 <sup>st</sup>	14	2	-	3	-	19	12	5	-	3	-	20	39
2 <sup>nd</sup>	13	2	-	4	-	19	18	1	-	5	-	24	43
3 <sup>rd</sup>	16	-	-	5	-	21	16	-	2	4	-	22	43
4 <sup>th</sup>	12	-	2	4	-	18	16	-	-	1	2	19	37
5 <sup>th</sup>	13	2	1	1	2	19	8	1	-	3	-	12	31
<b>Total</b>	<b>69</b>	<b>6</b>	<b>3</b>	<b>17</b>	<b>2</b>	<b>96</b>	<b>70</b>	<b>7</b>	<b>2</b>	<b>16</b>	<b>2</b>	<b>97</b>	<b>193</b>

L :LECTURING; TUT: TUTORIAL , S : SEMINAR ; P: PRACTICAL , TR.: TRAINING

## 2. Admission & Registration requirements

- 1- The original certificate of secondary school graduation – scientific department- with at least 70 % overall performance grade associated with an authorial stamped copy of the certificate. For certificates from outside Yemen, they must be translated (if not in Arabic language) and approved by authority entities in Yemen.
- 2- Cash pay for registration fees
- 3- A photocopy of personal or family identity card.
- 4- 10 frontal personal photocopies with a white background
- 5- A copy of the first 8 pages of the passport (for non-Yemeni students)  
The passport should be valid for at least one year to come.
- 6- A copy for health fitness certificate (for non-Yemeni students)

### Procedure for registration

Application for admission and registration should be done at the times specified by the university. The person who desire to admit this program should do the following:

1. Review the study system , regulations and the admission requirements ( he/she can get a copy from the unit of admission and registration (UAR) in the university).
2. Review the admission application papers offered by the university and fill it by him/herself and deliver it to the (UAR) in the university.
3. Deliver all the required certificates and papers required for admission to the UAR.
4. The administration of the UAR will revise the applier delivered papers to ensure their validation.
5. The UAR inform of the applier that his/her application is accepted/rejected.
6. If the application is accepted .he/she must pay the registration fee and deliver him/her a receipt for that.

## 14. Requirements of attendance and program accomplishment

The followings are ONLY basic terms that regulate the study in this program. Other important terms are delivered by the UAR to those who want to admit this program.

### General regulations

- The student who is regressed in this program will not be allowed to register in another program of the same College at the same time.

### Attendance

- Attendance of the student is obligatory in this program.
- At least he/she must attend at least 75 % of the study in both parts (theoretical and practical , if any)
- The student who fails to attend 75 % of each part will not be allowed to enter the final exams and will be considered "Failed" in the course. He/she also will not be allowed to attend the complementary exam either.

### Proceeding to next levels

- The student will processing to the next level (academic year) of the study if he/she passes all the level courses.
- After performing the final exams and the complementary exams:
  - The student who has failed in a total of two courses ( in that level or in the previous levels) can proceed to the next level only if one of these courses is a university-required courses.
  - The student who has failed in a total of three courses ( in that level or in the previous levels) can proceed to the next level only if one of these courses is a

university-required courses.

- If the student failed in a non-practical based course, he has no need to attend that course in the next year.
- If the student failed in a -practical based course, he has to attend the whole course again (both theoretical and practical part of the course) in the next year.
- The student who has passed a course will not be allowed to re-study that course again.

### **Outage and suspension of the study**

#### **The study outage**

- The study outage is a state when the student stopped attending the study and has not deliver a request to suspend it. The outage period allowed is maximum of three academic years.
- The new curriculum (if any) of the program is applied to the outage student when he/she re-joins the study.

#### **Suspension of the study**

- The maximum allowed period of suspension is a maximum of two academic years or four academic semesters either consecutive or not.
- The new curriculum (if any) of the program is applied to the suspending student when he/she re-joins the study.
- The student who wants to suspend the study must himself/herself (or a person authorized by him/her) deliver a written request to the dean of the College associated with a reasonable excuse for suspension.
- If the first semester has started , It is not permitted to accept requests of suspension.
- 

### **Withdrawal from the study**

- The student who wants to withdraw from the study must himself/herself (or a person authorized by him/her) deliver a written request to the dean of the College.
- He/she must pay all financial fees of the study and must be free from demands from all related units of the university.

<b>15. Graduation requirements</b>	
Requirement	Details
Total number of courses and credit hours required for graduation	<ul style="list-style-type: none"> <li>A total of 72 course + graduation project research course of a total of 193 credit hours</li> </ul>
Total number of actual field training hours required for graduation	<ul style="list-style-type: none"> <li>500 actual hours</li> </ul>
Minimum grade for success in every course	<ul style="list-style-type: none"> <li>The minimum grade % is 50 %            With conditions that the student must Attain at least 30 % of the degree of:           <ul style="list-style-type: none"> <li>the final theoretical exam</li> <li>the final practical exam</li> <li>the committee degree for graduation pharmacy field training courses.</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>The minimum grade % is 50 % and the minimal grade is (pass)</li> </ul>

## 16. Resources required to execute the program

### a. Learning sources

The program has the following learning sources

Learning source	Sections	Detail
White Boards		At least One at each classroom
Library	Office equipments :	Reading tables, Computer tables, chairs , Shelves for books and periodicals
	Books and Periodicals	suitable number of books and periodicals that comprehend all courses
	Electronic Books	the library computers will be supplied with a variety number of electronic books and CDs that comprehend a lot of courses
Information technology sources	Computer desktops	( 6 computers at the library and 50 at the computer lab.)
	Data show projectors	3
	Printer s	(1) at the library , (1) at the computer lab, (1) at the photocopy services center
	Photocopy machine	(1) at the library , (1) at the photocopy services center
	Scanner	(1) at the library , (1) at the computer lab,

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		(1) at the photocopy services center
	Flash memory cards (6 G) and CDs	Suitable amounts at the library (1) at the photocopy services center
	Internet links	(1) at the library , (1) at the computer lab
	Wireless networks	In the middle of the College

**b. Laboratories include : ( lab. Names , tools & equipments, chemicals & reagents)**

**1. Number and names of lab.**

No.	Lab. Name
i.	Pharmaceutics & Industrial pharmacy Lab.
ii.	Pharmaceutical Instrumental analysis Lab.
iii.	Physics & physiotherapy Lab
iv.	Pharmacognosy & Phytochemistry Lab.
v.	Chemistry Lab.
vi.	Basic medical Lab.
vii.	Biology & Microbiology Lab.
viii.	Lab. investigation Laboratory
ix.	Virtual Pharmacy
x.	Computer Lab.

**2. Tools & Equipments**

**a. Essential tools**

Appropriate quantities based on requirements of the lab

<b>Tools</b>
Filter papers
Test-tubes
Burettes
Glass rods
Conical flasks
Calibrated flasks
Beakers
Funnels
Separating funnels
Measuring volumetric cylinders
Pipettes
Package Bottles
Washing bottles
Microscopic slides
Spoons

Spatula
Syringes
Holders & stands
Mortars & pestles

**b. Simple Essential instruments**

Appropriate quantities based on requirements of the lab

<b>Instrument</b>
Electronic balances (2 digits )
Thermometers(electronic and mercuric)
Water bath (6 well)
Bunsen burners

**c. Safety aid**

<b>Aid</b>	<b>Quantity</b>
First- aid set	1 in every lab.
Fire extinguisher <b>bottle</b>	1 in every lab.
Cabinet for evaporated Gases and vapor suction system : whenever necessary	1 in every lab. (whenever necessary)
Air ventilation system	1 in each lab window
Safety instruction chart	1 in every lab.

**(d) Specialized equipments in Laboratories**

**(i)Pharmaceutics & Industrial pharmacy Lab.**

<i>No.</i>	<i>equipment name</i>	Quantity
<b>1.</b>	Manual capsule fillers	1
<b>2.</b>	Homogenizer	2
<b>3.</b>	Centrifuge.	1
<b>4.</b>	Sieves	10
<b>5.</b>	pH Meter	
<b>6.</b>	Suppository Mould	2 ( 1g) 2 ( 2 g)
<b>7.</b>	Magnetic stirrer	2



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<b>8.</b>	Melting point apparatus	1
<b>9.</b>	Hot plate	1
<b>10.</b>	Desiccators	1
<b>11.</b>	Tablet Coating – pan	1
<b>12.</b>	UV/visible Spectrophotometer	1
<b>13.</b>	Refrigerator	1
<b>14.</b>	Tablet single press	1
<b>15.</b>	US Sonnicator	1
<b>16.</b>	Buchner filtration system	2
<b>17.</b>	Electric Shaker	1

**(ii) Pharmaceutical instrumental analysis lab**

<i>No.</i>	<i>equipment name</i>	Quantity
1.	High performance liquid chromatography (HPLC) with UV detector	1
2.	Gas chromatography with flame photometer	1
3.	Dissolution apparatus	1
4.	Disintegration apparatus	1
5.	Hardness tester	1
6.	Friability tester	1
7.	UV/visible Spectrophotometer	1

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8.	Magnetic stirrer	1
9.	Homogenizer	1
10.	Electric Shaker	1

**(iii) Physics Lab**

<b>1.</b>	<i>equipment name</i>	Quantity
<b>2.</b>	Electromagnetic field inducer	1
<b>3.</b>	Hirsto Arch instrument	1
<b>4.</b>	Galvanometer	1
<b>5.</b>	Rheostat3600ohm	2
<b>6.</b>	Dry battery	1
<b>7.</b>	Micrometer	2
<b>8.</b>	Triple glass prism	2
<b>9.</b>	Triple plastic prism	3
<b>10.</b>	Lenses (different types)	2 boxes
<b>11.</b>	Spring for Hawk`s constant	1
<b>12.</b>	Electric wires for connection	1
<b>13.</b>	Voltammeter	1

**(iv) Pharmacognosy & Phytochemistry Lab**

<i>No.</i>	<i>equipment name</i>	Quantity
1	Chromatography column	2
2	Hot plate	1
3	Soxhlet apparatus With heating mantle	2
4	Oven	1
5	Rotary evaporator	1
6	Electric Shaker	1
7	Simple distillation apparatus	2
8	Steam distillation apparatus	2
9	TLC chamber	2
10	Magnetic stirrer	2
11	Light Microscopes	18
12	Electric grinder	2
13	Manual cutter	1
14	U.V lamp	1
15	Micro pipettes	5
16	Desiccators	3
17	Buchner filtration system	10
18	Chromatography plates	30

**(v) Chemistry lab**

<i>No.</i>	<i>equipment name</i>	Quantity
1.	UV/visible Spectrophotometer	1
2.	Hot plate	1
3.	Oven	1
4.	Buchner filtration system	3
5.	Autoclave	1
6.	Magnetic stirrer	2
7.	US Sonnicator	1
8.	pH Meter	2
9.	Micro pipettes	5

**(vi) Basic Medical sciences Lab.**

Anatomy/physiology models : Hip , eye, cardiac, kidney, dental care, skull, skeleton, elbow, male/female urogenital system, joints, muscular system, Brain, nervous system, Alimentary system, bones,	One of each model
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**(vii) Biology & Microbiology Lab.**

<i>No.</i>	<i>equipment name</i>	Quantity
1.	Autoclave	1
2.	Light Microscopes	20
3.	Oven	1
4.	Hot plate	2
5.	Incubator	1
6.	pH Meter	2
7.	Cupboard Storage	1
8.	Refrigerator	1
9.	Light Microscopes	10
10.	Petri dishes	<b>100</b>

**(viii) Laboratory investigations lab**

No.	<i>Equipments / tools</i>	<i>quantity</i>
1.	Histology teaching slides	1 box
2.	Light Microscopes	20

**(ix) Virtual pharmacy**

<ul style="list-style-type: none"> <li>• Shelves of appropriate size 4 x 4 m</li> </ul>
<ul style="list-style-type: none"> <li>• Instructional charts for pharmaceutical calculations</li> </ul>
<ul style="list-style-type: none"> <li>• Empty out-packages of a lot of pharmaceutical products available in Yemeni drug market and comprehend all generic names and variety of dosage forms</li> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Table + computer desktop + electronic program of drug indexes e.g. Mosby</li> <li>• + electronic books of drug indexes such as " Clinician drug index, BNF"</li> </ul>
<ul style="list-style-type: none"> <li>• A group of books of drug indexes e.g. MEPPPO, MIMS</li> </ul>



**(x) Computer lab**

Computer desktops and appendices : 30 on appropriate table Chairs
• Printer : 1
• Scanner : 1
• Internet link

**3. Chemicals & Reagents**

**A variety types of chemicals and reagents including acids, alkalis, plain elements, salts, solvents, indicators and others are required.**

**(a) Acids**

1. Sulfuric acid
2. Hydrochloric acid
3. Nitric acid
4. per chloric acid 70%
5. citric acid
6. Ascorbic acid (Vitamin C)
7. Benzoic acid
8. Tartaric acid
9. Tannic acid
10. tartaric acid
11. Boric acid
12. Salicylic acid
13. Acetyl salicylic acid
14. Sulphosalicylic acid
15. Oxalic acid
16. oleic acid
17. Acetic acid

**(b) Alkalis**

18. Sodium hydroxide
19. potassium hydroxide
20. calcium hydroxide

21. Ammonium hydroxide
22. Sodium bicarbonate
23. Sodium carbonate

**(e) Elements (plain)**

24. lead powder
25. zinc metal( powder)
26. sulphur
27. iodine
28. bromine water
29. silica gel 254

**(d) Salts**

30. Aluminum sulphate
31. Aluminum nitrate
32. Aluminum chloride
33. ammonium thiocyanate
34. Ammonium ferric citrate
35. Ammonium ferrous sulphate
36. Ammonium tartrate
37. Ammonium sulphate
38. Ammonium oxalate
39. Ammonium carbonate
40. Ammonium bicarbonate
41. Ammonium chloride
42. Ammonium acetate
43. barium sulphate
44. barium nitrate
45. barium chloride
46. cobalt chloride
47. copper II acetate
48. copper II sulphatecalcium carbonate
49. calcium sulphate
50. calcium acetate
51. calcium chloride
52. E.D.T.A sodium ( sodium salt of ethylene diaminetetraacetic acid)
53. ferric sulphate
54. Ferric chloride
55. Ferric sulphate

56. Sodium oxalate
57. Sodium format
58. Sodium chloride
59. Sodium borate (Borax)
60. Sodium nitroprusside
61. Sodium sulphite
62. Sodium nitrate
63. Sodium iodide
64. Sodium sulphate
65. Sodium metabisulphite
66. Sodium dodecyl sulphate (Sodium lauryl sulphate)
67. Sodium nitrite
68. Sodium sulfide
69. Tri Sodium citrate
70. Sodium acetate
71. Sodium bromide
72. Sodium cobalt nitrite
73. Sodium phosphate
74. potassium bromide
75. potassium cyanide
76. tripotassium citrate
77. Potassiumsulphate
78. Potassiumthiocyanate
79. Potassiumdichromate
80. potassium nitrate
81. potassium chloride
82. potassium ferricyanide
83. potassium iodide
84. potassium chromate
85. potassium carbonate
86. potassium permanganate
87. magnesium carbonate
88. magnesium sulphate
89. manganese sulphate
90. magnesium tri silicate
91. nickel sulphate
92. lead chloride
93. lead acetate
94. mercuric chloride
95. mercuric sulphate
96. mercuric nitrate

- 97. silver nitrate
- 98. zinc sulphate
- 99. zinc oxide

(e) **solvents**

- 100. Distilled water
- 101. Ethanol 96 %
- 102. Methylene chloride (Dichloromethane)
- 103. Ether
- 104. Chloroform
- 105. N-hexane
- 106. Cyclohexane
- 107. Benzene

(f) **Indicators**

- 108. Phenolphthalein
- 109. Phenol red
- 110. methyl red
- 111. methyl violet
- 112. methyl orange
- 113. fluorescein sodium
- 114. bromocresol green

(g) **Others**

- 115. Sorbitol
- 116. chloral hydrate
- 117. naphthalene
- 118. starch
- 119. gelatin
- 120. alpha naphthol
- 121. beta naphthol
- 122. acacia gum
- 123. gum tragacanth
- 124. resorcinol
- 125. Sudan III
- 126. talc
- 127. bees wax
- 128. calamine
- 129. bentonite
- 130. cetostearyl alcohol
- 131. kaolin

132. poly ethylene glycol(liquid PEG 300, PEG 400 & solid PEG 3000, PEG 4000)
133. sucrose
134. charcoal
135. lanolin (Wool fat)
136. Cocoa butter
137. gentian violet
138. tween 80
139. pure codliver oil
140. coco nut oil
141. diphenyl amine
142. thyme oil
143. Erichrom black T
144. Fehling's solution A&B
145. million's reagent
146. urea
147. Natural leaves , seeds, roots, rhizomes, flowers as plant parts and as powders (based on Pharmacognosy and phytochemistry practical courses)

## 17. Program Evaluation and Improvement

Evaluation Target	Evaluation period and tool	Samples
Final year students	Annual Questionnaire	50 % of the students registered in the program
Program Graduates	Every 2 years Questionnaire	50 % of the graduates
Employment entities	Every 3 years  (Questionnaire & Meeting)	<ul style="list-style-type: none"> <li>• Supervisors of med. Representatives in a marketing Drug company</li> <li>• Manager of a local drug factory</li> <li>• Head pharmacist in a private hospital</li> <li>• Head pharmacist in a public hospital</li> <li>• Manager of the Quality control lab. in the supreme board of drugs</li> </ul>

## Course Specification

### GENERAL BIOLOGY

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	General biology					
2.	Course Code & Number:	MSC 01					
3.	Credit hours:	C.H					TOTAL
		L.	Tut.	S.	P.	Tr.	
		2	-	-	1	-	3
4.	Study level/ semester at which this course is offered:	( first ) Year – ( 1 <sup>st</sup> ) semester					
5.	Pre –requisite (if any):	None					
6.	Co –requisite (if any):	None					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10.	Prepared By:						
11.	Date of Approval						

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

This course provides basic knowledge of life including basic processes in living organisms, cell structure and function as well as inheritance of living organisms.

### III. Intended learning outcomes of the course(CILOs) and their alignment to ProgramIntended learning outcomes (PILOs)

NO.	PILOs	CILOS
1.	A1	a1. Identify the biological structures of living organisms, the common features of Life process & the common genera & species of animal kingdom.
2.		a2. Describe the functions & components of the cell as the basic unit of life.
3.		a3. Determine the basic processes in the cell and its life cycle.
4.	A2	a4. Explicit the Energy sources in living organisms
5.		a5. Explain the role of enzymes & the Chemical constituents of the protoplasm in the cell.
6.	A3	a6. Discuss Mendel experiments and the molecular basis of inheritance : chromosome, DNA, genes
7.	B2	b1. Classify living organisms into kingdoms, genera and species
8.		b2. Differentiate between living organisms & non-living things and between animal cell and plant cell.
9.	B3	b3. Relate hereditary to its genetic factors.
10.	C1	c1. Handle efficiently different tools used in the biology lab.
11.		c2. Operate successfully the light microscope and other instruments used in the biology lab.
12.	C2	c3. Prepare effectively samples to study under microscope
13.	C3	c4. Take the required safety criteria during performing experiments in the biology lab.
14.	D1	d1. Share successfully in team-work in the biology lab
15.	D2	d2. Show respect to life.
16.	D3	d3. Communicate effectively with his/her colleagues in the biology lab
17.	D4	d4. Behave in discipline during of lab. Works in the biology lab.
18.	D5	d5. Demonstrate time management during practicing of lab. Works in the biology lab.



<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture, Lecture-discussion , laboratory practice	written exam , Practical assessment (Lab accomplishments, Lab. Reporting , practical exam)
a4, a5	Lecture,Lecture-discussion , feed-back learning	written exam, assignment
a6	Lecture, Lecture-discussion, , feed-back learning, Group-project.	written exam , assignment
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) ofIntellectualSkillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, Lecture-discussion , feed-back learning	written exam , quizzes
b3	Lecture, Lecture-discussion , feed-back learning	written exam, quizzes
<b>(c)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
c3	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
c4	Lab. Practice	Practical assessment (Lab accomplishments + practical

		exam ) ,
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1	Lab. Practice , Group-project , feed-back learning	Practical assessment (Lab Reporting & Attitude)
d2	Lecture-discussion	Written exam
d3.	Lab. Practice	Practical assessment (Lab Attitude)
d4	Lab. Practice	Practical assessment (Lab Attitude)
d5	Lab. Practice , Group-project	Practical assessment (Lab Attitude)

IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/ Topics List	Learning Outcomes	Sub Topics List	No. of Weeks	contact hours
1	<b>Scope of Biology</b>	a1, a2, b2	<ul style="list-style-type: none"> <li>Definitions and brief history of biology</li> <li>Living organisms and Non-Living things</li> <li>Chemical context of life</li> <li>Common features of Life process .</li> <li>Biological structures of living organisms: cell, tissue, organ, system.</li> <li>Energy sources in living organisms</li> </ul>	4	8
2	<b>The cell : the basic unit of life</b>	a3, a4, a5, b2	<ul style="list-style-type: none"> <li>Structure and components of the cell: cell membranes : types, Functions and properties, cytoplasm, Micro and macro molecules of cell</li> <li>Function of enzymes &amp; Chemical constituents of the protoplasm</li> <li>basic process in the cell (respiration, nutrition, etc.)</li> <li>life cycle of the cell</li> <li>differences between animal and plant cell.</li> </ul>	4	8
<b>MID-TERM EXAM</b>				1	2
3	<b>animal kingdom</b>	a1, b1	<ul style="list-style-type: none"> <li>classification of living organisms into kingdoms, genera and species.</li> <li>Animal kingdoms classification : Genera and species; common features, diversity &amp; reproduction.</li> <li>Examples of common species of general of animal kingdoms and their anatomical features.</li> </ul>	3	6
4	<b>Inheritance</b>	a6, b3	<ul style="list-style-type: none"> <li>Mendel Experiments and the Gene Idea</li> <li>Molecular basis of inheritance : chromosome, DNA, genes</li> </ul>	2	4
<b>Course Review and discussion session</b>				1	2

FINAL - EXAM	1	2
<b>TOTAL</b>	16	32
<b>Number of Weeks /and Units Per Semester</b>	16	4

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Learning Outcomes
1.	<b>Introduction to biology lab:</b> safety, tools, instruments, scope of experiments and reporting assignments.	1	2	c1, c2, c3, c4, d1, d3, d4, d5
2.	<b>Structure &amp; components of the cells:</b> using illustrative models	1	2	a2, c1, c2, c3, c4, d1, d3, d4, d5
3.	<b>Light microscope:</b> sample preparations, operation	2	4	c1, c2, c3, c4, d1, d3, d4, d5
4.	<b>Differentiation between animal and plant cells.</b>	1	2	b2, c1, c2, c3, c4, d1, d3, d4, d5
5.	<b>Common species of animal genera:</b> morphological and microscopical features	4	2	a1, b1, c1, c2, c3, c4, d1, d3, d4, d5
6.	<b>Molecular basis of hereditary</b> using illustrative models.	1	2	a6, b3, c1, c2, c3, c4, d1, d3, d4, d5
7.	<b>Mendel experimentation</b> of hereditary	1	2	a6, b3, c1, c2, c3, c4, d1, d3, d4, d5
PRACTICAL EXAM		1	2	c1, c2, c3, c4, d1, d3, d4, d5
<b>Total</b>		12	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.          The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student`s brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>lecture - Discussion</b>: a short lecture/ address followed by discussion</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search report of an enzyme/ chemical constituent in the cell	a5	4-13	3
2	<b>Group</b> : each group of students will be assigned to do a search-report about genetic elements	a6	14	2

## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion % of Total course Assessment	Aligned Course Learning Outcomes
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, a4, a5, b1, b2, b3
2	Assignments (1 + 2)	4-13, 14	5	5	a5, a6
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b1, b3
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, a4, a5, b2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, a5, b1, b2, b3
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion % of Total course Assessment	Aligned Course Learning Outcomes
1	Lab. Attendance	Weekly	5	5	ALL
2	Lab. Attitude	weekly	2.5	2.5	d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a1, b1, c1, c2
4	Lab. Reporting	weekly	2.5	2.5	a1, c4, d1
5	Exam of practice theory (written exam or oral exam)	14	5	5	ALL
6	Practical exam (practical)	14	20	20	ALL
Total			40	40 %	

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. A text book of Zoology
<b>2- Essential References.</b>
1. Sardana. A text book of pharmaceutical biology 2. Parthasarathi. Molecular biology of the cell
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of GENERAL BIOLOGY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
This course provides basic knowledge of life including basic processes in living organisms, cell structure and function as well as inheritance of living organisms.

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs)		
NO.	PILOs	CILOS
1.	A1	a1. Identify the biological structures of living organisms , the common features of Life process & the common genera & species of animal kingdom.



2.		a2. Describe the functions & components of the cell as the basic unit of life.
3.		a3. Determine the basic processes in the cell and its life cycle.
4.	A2	a4. ExplicittheEnergy sources in living organisms
5.		a5. Explain the role of enzymes &the Chemical constituents of the protoplasm in the cell.
6.	A3	a6. Discuss Mendel experiments and the molecular basis of inheritance : chromosome, DNA, genes
7.	B2	b1. Classify living organisms into kingdoms, genera and species
8.		b2. Differentiate between living organisms& non-living things and between animal cell and plant cell.
9.	B3	b3. Relatehereditary to its genetic factors.
10.	C1	c1.Handle efficiently different tools used in the biology lab.
11.		c2. Operate successfully the light microscope and other instruments used in the biology lab.
12.	C2	c3 .Prepare effectively samples to study under microscope
13.	C3	c4 .Take the required safety criteria during performing experiments in the biology lab.
14.	D1	d1. Share successfully in team-work in the biology lab
15.	D2	d2. Show respect to life.
16.	D3	d3. Communicate effectively with his/her colleagues in the biology lab
17.	D4	d4. Behave in discipline during of lab. Works in the biology lab.
18.	D5	d5. Demonstrate time management during practicing oflab. Works in the biology lab.

**(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies**

Course Intended	Teaching strategies	Assessment Strategies
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Learning Outcomes		
a1, a2, a3	Lecture, Lecture-discussion , laboratory practice	written exam , Practical assessment (Lab accomplishments, Lab. Reporting , practical exam)
a4, a5	Lecture, Lecture-discussion , feed-back learning	written exam, assignment
a6	Lecture, Lecture-discussion, , feed-back learning, Group-project.	written exam , assignment
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, Lecture-discussion , feed-back learning	written exam , quizzes
b3	Lecture, Lecture-discussion , feed-back learning	written exam, quizzes
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
c3	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
c4	Lab. Practice	Practical assessment (Lab accomplishments + practical exam ) ,
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Lab. Practice , Group-project , feed-back learning	Practical assessment (Lab Reporting & Attitude)
d2	Lecture-discussion	Written exam
d3.	Lab. Practice	Practical assessment (Lab Attitude)
d4	Lab. Practice	Practical assessment (Lab Attitude)
d5	Lab. Practice , Group-project	Practical assessment (Lab Attitude)

#### IV. Course Content:

##### A – Theoretical Aspect:

Order	Units/ Topics List	Learning Outcomes	Sub Topics List	No. of Weeks	contact hours
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1	<b>Scope of Biology</b>	a1, a2, b2	<ul style="list-style-type: none"> <li>Definitions and brief history of biology</li> <li>Living organisms and Non-Living things</li> <li>Chemical context of life</li> <li>Common features of Life process .</li> <li>Biological structures of living organisms: cell, tissue, organ, system.</li> <li>Energy sources in living organisms</li> </ul>	4	8
2	<b>The cell : the basic unit of life</b>	a3, a4, a5, b2	<ul style="list-style-type: none"> <li>Structure and components of the cell: cell membranes : types, Functions and properties, cytoplasm, Micro and macro molecules of cell</li> <li>Function of enzymes &amp; Chemical constituents of the protoplasm</li> <li>basic process in the cell (respiration, nutrition, etc.)</li> <li>life cycle of the cell</li> <li>differences between animal and plant cell.</li> </ul>	4	8
<b>MID-TERM EXAM</b>				1	2
3	<b>animal kingdom</b>	a1, b1	<ul style="list-style-type: none"> <li>classification of living organisms into kingdoms, genera and species.</li> <li>Animal kingdoms classification : Genera and species; common features, diversity &amp; reproduction.</li> <li>Examples of common species of general of animal kingdoms and their anatomical features.</li> </ul>	3	6
4	<b>Inheritance</b>	a6, b3	<ul style="list-style-type: none"> <li>Mendel Experiments and the Gene Idea</li> <li>Molecular basis of inheritance : chromosome, DNA, genes</li> </ul>	2	4
<b>Course Review and discussion session</b>				1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16	4

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Learning Outcomes
8.	<b>Introduction to biology lab:</b> safety, tools,	1	2	c1, c2, c3, c4, d1, d3, d4, d5

	instruments, scope of experiments and reporting assignments.			
9.	<b>Structure &amp; components of the cells:</b> using illustrative models	1	2	a2, c1, c2, c3, c4, d1, d3, d4, d5
10.	<b>Light microscope:</b> sample preparations, operation	2	4	c1, c2, c3, c4, d1, d3, d4, d5
11.	<b>Differentiation between animal and plant cells.</b>	1	2	b2, c1, c2, c3, c4, d1, d3, d4, d5
12.	<b>Common species of animal genera:</b> morphological and microscopical features	4	2	a1, b1, c1, c2, c3, c4, d1, d3, d4, d5
13.	<b>Molecular basis of hereditary</b> using illustrative models.	1	2	a6, b3, c1, c2, c3, c4, d1, d3, d4, d5
14.	<b>Mendel experimentation</b> of hereditary	1	2	a6, b3, c1, c2, c3, c4, d1, d3, d4, d5
PRACTICAL EXAM		1	2	c1, c2, c3, c4, d1, d3, d4, d5
<b>Total</b>		12	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>lecture - Discussion:</b> a short lecture/ address followed by discussion</p>
<p><b>Laboratory practice:</b> students doing experiments in labs individually or in small groups</p>

<b>Feed-back learning:</b> students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction & evaluation
<b>Group projects:</b> students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

VI. Assignments:				
No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	<b>Individual:</b> every student is assigned to do an enzyme/ chemical constituent in the cell	a5	4-13	3
2	<b>Group :</b> each group of students will be assigned to do a search-report about genetic elements	a6	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course	Aligned Course Learning Outcomes

				Assessment	
1	Attendance	1 - 15	5	5 %	a1, a2, a3, a4, a5, b1, b2, b3
2	Assignments (1 + 2)	4-13, 14	2.5	2.5 %	a5, a6
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5 %	b1, b3
4	Mid-semester exam of theoretical part ( written exam	7	10	10 %	a1, a2, a3, a4, a5, b2
5	Final exam of theoretical part ( written exam)	17	40	40 %	a1, a2, a3, a4, a5, b1, b2, b3
TOTAL			60	60 %	

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes
1	Lab. Attendance	Weekly	5	5 %	ALL
2	Lab. Attitude	weekly	2.5	2.5 %	d1, d3, d4
3	Lab. Accomplishments	weekly	2.5	2.5 %	a1, b1, c1, c2
4	Lab. Reporting	weekly	5	5 %	a1, c4, d1
5	Exam of practice theory (written exam or oral exam)	14	5	5 %	ALL
6	Practical exam (practical)	14	20	20 %	ALL
Total			40	40	

## VIII. Learning Resources:

1- Required Textbook(s) ( maximum two ).

2. A text book of Zoology

2- Essential References.

3. Sardana. A text book of pharmaceutical biology

4. Parthasarathi. Molecular biology of the cell

3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

### IX. Course Policies:

5.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
6.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
7.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
8.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### GENERAL CHEMISTRY

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	General chemistry					
2.	Course Code & Number:	MSC 02					
3.	Credit hours:	C.H					
		Theoretical			P.	Tr.	TOTAL
		L.	Tut.	S.			
		2	-	-	1	-	3
4.	Study level/ semester at which this course is offered:	( FIRST ) Year – (1 <sup>ST</sup> ) semester					
5.	Pre –requisite (if any):	NONE					
6.	Co –requisite (if any):	NONE					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10.	Prepared By:						
11.	Date of Approval	<b>10/2016</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

<b>II. Course Description:</b>
The course concerns with study of basic concepts of chemistry as an introduction to specific pharmaceutical and medicinal chemistry courses.

### III. Intended learning outcomes of the course: (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No	PILOs	Intended learning outcomes of the course (CILOs)
1.	A2	a1. Explain the roles of chemistry in modern sciences .
2.		a2. Explicitthechemical structures of matters and their chemical properties
3.	A3	a3. Discuss the principles and types of chemical reactions
4.	B1	b1. Interpretthe type of chemical bond that form between atoms
5.	B2	b2 .Solve chemical problems related to chemical formula, electronic configuration , quantum (molecular weight, molarity, normality), pH, ionization constant and pKa
6.		b3. Classifytypes of electronic configuration, categories of elements based on periodical table, types of chemical compounds based on certain chemical properties such as acidity/basicity
7.		b4. Compare between the different types of chemistry disciplines and also between inorganic and organic compounds.
8.	B3	b5 .Express the chemical compounds and elements using abbreviate letters.
9.		b6. Relatethe electronic configuration to atom reactivity.
10.		b7. Predict the outcomes of a chemical reaction between two chemical entities.
11.	C1.	c1.Handle efficiently the tools and chemicals used inchemistry lab.
12.		c2. Operate successfully pH-meter and other instruments used in chemistry lab.
13.	C2	c3 .Perform effectively chemical experimentations including chemical reactions and identification in chemistry lab using standard procedures and provide report of his work.
14.	C3	c4 .Take the required safety criteria during performing experiments in chemistry lab.
15.	D1	d1. Share successfully in team-work during performing experiments in chemistry lab.
16.	D3	d2. Communicate effectively with his/her colleagues during performing experiments in chemistry lab.
17.	D4	d3.Behave in discipline during performing experiments in chemistry lab.
18.	D5	d4. Demonstrate time management during performing experiments in chemistry lab.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture,Lecture-discussion	written exam
a3	Lecture,Lecture-discussion	written exam
<b>(b) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lectures	Written exam
b2, b3 , b4	Lecture,Lecture-discussion , feed-back learning	written exam , assignment, quizzes
b5, b6 , b7	Lecture,Lecture-discussion, feed-back learning	written exam, quizzes
<b>(c)Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment (Lab accomplishments, lab. reporting, practical exam )
c3	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
C4	Lab. Practice	Practical assessment (Lab accomplishment + practical exam )
<b>(d) Alignment Course Intended Learning Outcomes of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Lab. Practice	Practical assessment (Attitude)

d2	Lab. Practice,	Practical assessment (Lab Attitude)
d3	Lab. Practice	Practical assessment (Lab Attitude)
d4	Lab. Practice	Practical assessment (Lab Attitude)

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	Aligned Course Learning Outcomes	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, b4	<ul style="list-style-type: none"> <li>chemistry (definition, brief history)</li> <li>disciplines of chemistry : general, organic, inorganic, analytical, medicinal, physical, etc.)</li> <li>importance and applications of chemistry in modern sciences.</li> </ul>	1	2
2	<b>Chemical structures</b>	a2, b1, b2, b3, b6	<ul style="list-style-type: none"> <li>atoms , atomic structure</li> <li>electronic configuration</li> <li>molecules and molecular formula,</li> <li>elements, periodic table of elements,</li> <li>compounds (types)</li> <li>chemical bonds (ionic, covalent, etc)</li> </ul>	3	6
3	<b>Chemical properties</b>	a2, b2	<ul style="list-style-type: none"> <li>electronegativity, dipole moments, polar and non-polar molecules</li> <li>acidity, basicity. (pH), ionization constant , pKa</li> <li>buffer systems</li> </ul>	2	4
<b>MID-TERM EXAM</b>				1	2
4	<b>Quantum in chemistry</b>	b2	<ul style="list-style-type: none"> <li>atomic weight, molecular weight, equivalent weight, milliequivalent, moles</li> <li>molarity, molality, normality</li> </ul>	2	4
5	<b>Chemical reactions and equilibrium</b>	a3, b7, c2	<ul style="list-style-type: none"> <li>chemical reactivity, inertness, energy change and heat of reaction</li> <li>chemical equations balance</li> <li>reactions catalysts</li> <li>acid-base reactions, Redox reactions, addition reaction, elimination reactions, substitution reactions, decomposition reactions etc.</li> </ul>	3	6
6	<b>Inorganic chemistry</b>	b4, c2	<ul style="list-style-type: none"> <li>○ Comparison between inorganic and organic compounds.</li> <li>○ Identification and reactions of common inorganic compounds               <ul style="list-style-type: none"> <li>● Cationic radicals</li> <li>● Anionic radicals</li> </ul> </li> </ul>	3	6
<b>Course Review and discussion session</b>				1	2

FINAL - EXAM	1	2
<b>TOTAL</b>	16	32
<b>Number of Weeks /and Units Per Semester</b>	16 weeks	6 units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Learning Outcomes
1.	Introduction to chemistry lab: safety, tools, instruments, scope of experiments and reporting assignments. Chemical structures (atoms, molecules, bonds) using models	1	2	c1, c2 a2
2.	pH- meter principle and standard operation procedure: determination of pH of water, weak acids / bases determination of pH of strong acids/bases, salts	1	2	c1, c2, c3, c4, d1, d2, d3, d4
3.	Preparation of buffers phosphate , citrate , acetate	1	2	c1, c2, c3, c4, d1, d2, d3, d4
4.	Oxidation reactions using potassium permanganate & Decomposition reaction of sodium bicarbonate in water.	1	2	c1, c2, c3, c4, d1, d2, d3, d4
5.	Acid/base reaction s e.g : HCl and NaOH	1	2	c1, c2, c3, c4, d1, d2, d3, d4
6.	Scheme Identification of cationic inorganic radicals	3	6	c1, c2, c3, c4, d1, d2, d3, d4
7.	Scheme Identification of anionic inorganic radicals	3	6	c1, c2, c3, c4, d1, d2, d3, d4
<b>PRACTICAL EXAM</b>		1	2	a2, c1, c2, c3, c4
<b>Total</b>		12	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			12	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**lecture - Discussion**: a short lecture/ address followed by discussion

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOS(symbols)	Week Due	Mark
1	<b>Individual</b> : every student is assigned to solve problems presented by the teacher on chemical formula, electronic configuration , quantum (molecular weight, molarity, normality), pH, ionization constant and pKa	b2	4-13	3
2	<b>Group</b> : each group of students will be assigned to do a search-report about one type of chemical reactions	a3	14	2

## VII. Schedule of Assessment Tasks for Students During the Semester

Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion % of Total course Assessment	Aligned Course Learning Outcomes
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b1, b2 b3, b4, b6, b7
2	Assignments (1 + 2)	4-13, 14	5	5	a3, b2
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b2, b5
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a1, a2, b1, b2 b3, b4, b6
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b1, b2 b3, b4, b6, b7
TOTAL			60	60 %	60

Practicalpart assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes
1	Lab. Attendance	Weekly	5	5 %	b1, c1, c2, c3, d1, d2, d3, d4
2	Lab. Attitude	weekly	2.5	2.5 %	d1, d2, d3, d4
3	Lab. Accomplishments	weekly	5	5 %	b1, c1, c2, c3
4	Lab. Reporting	weekly	2.5	2.5 %	c2
5	Exam of practice theory (written exam or oral exam)	14	5	5 %	b1, c1, c2, c3
6	Practical exam (practical)	14	20	20 %	b1, c1, c2, c3
Total			40	40	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Cotton . Basic inorganic chemistry



2- Essential References.
2. Bothara. inorganic pharmaceutical chemistry 3. Richard E. Beleil , General chemistry Lab. Manual, 2005, Dakota State university 4. British pharmacopeia, 2013
3- Electronic Materials and Web Sites etc.
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

IX. Course Policies:	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of GENERAL CHEMISTRY

I. - Information about Faculty Member Responsible for the Course:						
Name of Faculty Member		Office Hours				
Location & Telephone No.		SAT	SUN	MON	TUE	WED
E-mail						

II. Course Description:
The course concerns with study of basic concepts of chemistry as an introduction to specific pharmaceutical and medicinal chemistry courses.

### III. Intended learning outcomes of the course: (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No	PILOs	Intended learning outcomes of the course (CILOs)
1.	A2	a1. Explain the roles of chemistry in modern sciences .
2.		a2. Explicitthechemical structures of matters and their chemical properties
3.	A3	a3. Discuss the principles and types of chemical reactions
4.	B1	b1. Interpretthe type of chemical bond thatform between atoms
5.	B2	b2 .Solve chemical problems related to chemical formula, electronic configuration , quantum (molecular weight, molarity, normality), pH, ionization constant and pKa
6.		b3. Classify types of electronic configuration, categories of elements based on periodical table, types of chemical compounds based on certain chemical properties such as acidity/basicity
7.		b4. Compare between the different types of chemistry disciplines and also between inorganic and organic compounds.
8.	B3	b5 .Express the chemical compounds and elements using abbreviate letters.
9.		b6. Relatethe electronic configuration to atom reactivity.
10.		b7. Predict the outcomes of a chemical reaction between two chemical entities.
11.	C1.	c1.Handle efficiently the tools and chemicals used inchemistry lab.
12.		c2. Operate successfully pH-meter and other instruments used in chemistry lab.
13.	C2	c3 .Perform effectively chemical experimentations including chemical reactions and identification in chemistry lab using standard procedures and provide report of his work.
14.	C3	c4 .Take the required safety criteria during performing experiments in chemistry lab.
15.	D1	d1. Share successfully in team-work during performing experiments in chemistry lab.
16.	D3	d2. Communicate effectively with his/her colleagues during performing experiments in chemistry lab.
17.	D4	d3. Behave in discipline during performing experiments in chemistry lab.
18.	D5	d4. Demonstrate time management during performing experiments in chemistry lab.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture, Lecture-discussion	written exam
a3	Lecture, Lecture-discussion	written exam

### (b) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lectures	Written exam
b2, b3 , b4	Lecture, Lecture-discussion , feed-back learning	written exam , assignment, quizzes
b5, b6 , b7	Lecture, Lecture-discussion , feed-back learning	written exam, quizzes

### (c) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment (Lab accomplishments, lab. reporting, practical exam )
c3	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
C4	Lab. Practice	Practical assessment (Lab accomplishment + practical exam )

### (d) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Lab. Practice	Practical assessment (Attitude)
d2	Lab. Practice,	Practical assessment (Lab Attitude)

d3	Lab. Practice	Practical assessment (Lab Attitude)
d4	Lab. Practice	Practical assessment (Lab Attitude)

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	Aligned Course Learning Outcomes	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, b4	<ul style="list-style-type: none"> <li>chemistry (definition, brief history)</li> <li>disciplines of chemistry : general, organic, inorganic, analytical, medicinal, physical, etc.)</li> <li>importance and applications of chemistry in modern sciences.</li> </ul>	1	2
2	<b>Chemical structures</b>	a2, b1, b2, b3, b6	<ul style="list-style-type: none"> <li>atoms , atomic structure</li> <li>electronic configuration</li> <li>molecules and molecular formula,</li> <li>elements, periodic table of elements,</li> <li>compounds (types)</li> <li>chemical bonds (ionic, covalent, etc)</li> </ul>	3	6
3	<b>Chemical properties</b>	a2, b2	<ul style="list-style-type: none"> <li>electronegativity, dipole moments, polar and non-polar molecules</li> <li>acidity, basicity. (pH), ionization constant , pKa</li> <li>buffer systems</li> </ul>	2	4
<b>MID-TERM EXAM</b>				1	2
4	<b>Quantum in chemistry</b>	b2	<ul style="list-style-type: none"> <li>atomic weight, molecular weight, equivalent weight, milliequivalent, moles</li> <li>molarity, molality, normality</li> </ul>	2	4
5	<b>Chemical reactions and equilibrium</b>	a3, b7, c2	<ul style="list-style-type: none"> <li>chemical reactivity, inertness, energy change and heat of reaction</li> <li>chemical equations balance</li> <li>reactions catalysts</li> <li>acid-base reactions, Redox reactions, addition reaction, elimination reactions, substitution reactions, decomposition reactions etc.</li> </ul>	3	6
6	<b>Inorganic chemistry</b>	b4, c2	<ul style="list-style-type: none"> <li>○ Comparison between inorganic and organic compounds.</li> <li>○ Identification and reactions of common inorganic compounds               <ul style="list-style-type: none"> <li>● Cationic radicals</li> <li>● Anionic radicals</li> </ul> </li> </ul>	3	6
<b>Course Review and discussion session</b>				1	2

FINAL - EXAM	1	2
<b>TOTAL</b>	16	32
<b>Number of Weeks /and Units Per Semester</b>	16 weeks	6 units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Learning Outcomes</b>
1.	Introduction to chemistry lab: safety, tools, instruments, scope of experiments and reporting assignments. Chemical structures (atoms, molecules, bonds) using models	1	2	c1, c2 a2
2.	pH- meter principle and standard operation procedure: determination of pH of water, weak acids / bases determination of pH of strong acids/bases, salts	1	2	c1, c2, c3, c4, d1, d2, d3, d4
3.	Preparation of buffers phosphate , citrate , acetate	1	2	c1, c2, c3, c4, d1, d2, d3, d4
4.	Oxidation reactions using potassium permanganate & Decomposition reaction of sodium bicarbonate in water.	1	2	c1, c2, c3, c4, d1, d2, d3, d4
5.	Acid/base reaction s e.g : HCl and NaOH	1	2	c1, c2, c3, c4, d1, d2, d3, d4
6.	Scheme Identification of cationic inorganic radicals	3	6	c1, c2, c3, c4, d1, d2, d3, d4
7.	Scheme Identification of anionic inorganic radicals	3	6	c1, c2, c3, c4, d1, d2, d3, d4
<b>PRACTICAL EXAM</b>		1	2	a2, c1, c2, c3, c4
<b>Total</b>		12	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.                  The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>lecture - Discussion</b>: a short lecture/ address followed by discussion</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	<p><b>Individual</b>: every student is assigned to solve problems provided by the teacher as homework. Topics of problems should include chemical formula, electronic configuration , quantum (molecular weight, molarity, normality), pH, ionization constant and pKa. The teacher should give a feed-back on the student work booklet and should 1-2 students weekly to solve a problem on the board to make sure that the student deserve his/her marks.</p>	b2	4-13	3
2	<p><b>Group</b> : each group of students will be assigned to do a search-report about one type of chemical reactions</p>	a3	14	2

## VII. Schedule of Assessment Tasks for Students During the Semester

Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment %	Aligned Course Learning Outcomes
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b1, b2 b3, b4, b6, b7
2	Assignments (1 + 2)	4-13, 14	5	5	a3, b2
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b2, b5
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a1, a2, b1, b2 b3, b4, b6
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b1, b2 b3, b4, b6, b7
TOTAL			60	60 %	

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment %	Aligned Course Learning Outcomes
1	Lab. Attendance	Weekly	5	5	b1, c1, c2, c3, d1, d2, d3, d4
2	Lab. Attitude	weekly	2.5	2.5	d1, d2, d3, d4
3	Lab. Accomplishments	weekly	5	5	b1, c1, c2, c3
4	Lab. Reporting	weekly	2.5	2.5	c2
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, c1, c2, c3
6	Practical exam (practical)	14	20	20	b1, c1, c2, c3
Total			40	40 %	

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Cotton . Basic inorganic chemistry
<b>2- Essential References.</b>
2. Bothara. inorganic pharmaceutical chemistry 3. Richard E. Beileil , General chemistry Lab. Manual, 2005, Dakota State university 4. British pharmacopeia, 2013
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### " INTRODUCTION TO PHARMACY PROFESSION "

I. Course Identification and General Information:						
1.	Course Title:	INTRODUCTION TO PHARMACY PROFESSION				
2.	Course Code & Number:	PHRT 01				
3.	Credit hours:	C.H				TOTAL
		L.	Tut.	S.	P.	
		2	-	-	1	-
4.	Study level/ semester at which this course is offered:	( first ) Year – ( 1 <sup>st</sup> ) semester				
5.	Pre –requisite (if any):	None				
6.	Co –requisite (if any):	None				
7.	Program (s) in which the course is offered:	All BC programs offered by the university				
8.	Language of teaching the course:	ENGLISH				
9.	Location of teaching the course:	IN THE UNIVERSITY				
10.	Prepared By:					
11.	Date of Approval	10/2016				

II. Course Description:	
The course provides essential introduction to pharmacy as profession, its past, current and future carriers.	

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A4	a1. Comprehend the current missions of pharmacy profession and the duties of pharmacists as drug experts.
2.		a2. Identify the basic pharmacy sciences, academic programs and the foundations that control pharmacy laws
3.		a3. Grasp the progress of pharmacy throughout history and its current and future development and fields.
4.		a4. Recognize the current carriers of pharmacy profession and the new
5.	B2	b1. Classify drug risks and drug benefits.
6.	B3	b2. Relate the role of Arab and Muslims and to pharmacy progress.
7.	C4	c1. Use the media technologies to communicate, search and present thoughts
8.	D2	d1. commit to community and patients serving through understanding of his/her mission as drug experts.
9.	D4	d2. Comply to pharmacy laws.

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3, a4	Lecture, Lecture-discussion	written exam , assignment

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture, Lecture-discussion , feed-back learning	written exam , quizzes

<b>b2</b>	Lecture,Lecture-discussion, feed-back learning	written exam, quizzes
<b>(C)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
<b>c1</b>	Feed-back learning ,Group-project.	Assignment, Written- exam
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
<b>d1</b>	Lecture-discussion	Written exam
<b>d2</b>	Lecture-discussion	Written exam

## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Pharmacy and pharmacists</b>	a1, a2, d2, d4	<ul style="list-style-type: none"> <li>• definitions (pharmacy, pharmacist, drugs, medications, drug products)</li> <li>• pharmacy motto</li> <li>• Pharmacy profession missions</li> <li>• foundations of pharmacy (world , Asian, Arabic and Yemeni)</li> <li>• Relation of pharmacists with other health care professionals.</li> </ul>	2	4
2	<b>Current pharmacy practices</b>	a4, a2	<ul style="list-style-type: none"> <li>• Pharmacy career opportunities (academic, industrial, researcher , developer, hospital, clinical and community pharmacists)</li> </ul>	2	4
3	<b>Education of pharmacy</b>	a2	<ul style="list-style-type: none"> <li>• basic pharmacy sciences</li> <li>• academic Baccalaureate programs, higher programs.</li> </ul>	1	2
4	<b>Pharmacists as drug experts</b>	b1,	<ul style="list-style-type: none"> <li>• drugs benefits</li> <li>• drugs risks</li> <li>• Role of pharmacists as drug experts</li> <li>• sources of information (primary, secondary, tertiary).</li> </ul>	1	2
<b>MID-TERM EXAM</b>				1	2
5	<b>History of pharmacy</b>	a1, b2	History of pharmacy in : <ul style="list-style-type: none"> <li>○ in Sumerian,</li> <li>○ Egyptian</li> <li>○ Chinese, Indian,</li> <li>○ Roman, Greek</li> <li>○ Arabic and Islamic</li> <li>○ Western civilization</li> </ul>	5	10
6	<b>Future aspects of pharmacy</b>	a2, a3	<ul style="list-style-type: none"> <li>• factors influencing future of pharmacy</li> <li>• current development of pharmacy profession</li> <li>• newer pharmacy disciplines e.g. Complementary and alternative therapy, gene therapy and radiopharmacy</li> </ul>	2	4
<b>Course Review</b>		a1, a2, a3, a4, b1, b2, c1, d1, d2	Review of the course topics by discussion session	1	2
<b>FINAL - EXAM</b>				1	2

TOTAL	16	32
Number of Weeks /and Units Per Semester	16 weeks	6 units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**lecture - Discussion**: a short lecture/ address followed by discussion

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search-report on one of the newer pharmacy disciplines.	a3	4-13	6
2	<b>Group</b> : each group of students will be assigned to do a search report on one of the famous ancient Muslim Pharmacist	c1	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5 %	a1, a2, a3, a4, b1, b2, c1, d1, d2
2	Assignments (1 + 2)	4, 14	10	10 %	a3, c1
3	Quiz 1 + Quiz 2	7, 12	5	5 %	b1, b2
4	Mid-semester exam of theoretical part ( written exam)	7	20	20 %	a1, a2, a4, b1, d2, d4
5	Final exam of theoretical part ( written exam)	17	60	60 %	a1, a2, a3, a4, b1, b2, c1, d1, d2
TOTAL			100	100 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Lillian M. Azzopardi . Lecture notes in pharmacy practice, 2010, pharmaceutical press

### 2- Essential References.

1. Howard C. Ansel. Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems, , 2011, Lippincott Williams & Wilkins
2. Kevin M.G.Taylor. Pharmacy Practice, 2001, Taylor & Francis

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

<b>IX.Course Policies:</b>	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of

### INTRODUCTION TO PHARMACY PROFESSION

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

III. Course Description:
The course provides essential introduction to pharmacy as profession, its past, current and future carriers.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 3. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A4	a1. Comprehend the current missions of pharmacy profession and the duties of pharmacists as drug experts.
2.		a2. Identify the basic pharmacy sciences, academic programs and the foundations that control pharmacy laws
3.		a3 . Grasp the progress of pharmacy throughout history and its current and future development and fields.
4.		a4. Recognize the current carriers of pharmacy profession and the new
5.	B2	b1. Classify drug risks and drug benefits.
6.	B3	b2. Relatethe role of Arab and Muslims and to pharmacy progress.
7.	C4	c1. Use the media technologies to communicate, search and present thoughts
8.	D2	d1. commit to community and patients serving through understanding of his/her mission as drug experts.
9.	D4	d2. Comply to pharmacy laws.

#### 4. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3, a4	Lecture, Lecture-discussion	written exam , assignment

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skillsto Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture, Lecture-discussion , feed-back learning	written exam , quizzes
b2	Lecture, Lecture-discussion , feed-back learning	written exam, quizzes

<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>c1</b>	<b>Feed-back learning , Group-project.</b>	<b>Assignment, Written- exam</b>
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1</b>	<b>Lecture-discussion</b>	<b>Written exam</b>
<b>d2</b>	<b>Lecture-discussion</b>	<b>Written exam</b>

IV. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Pharmacy and pharmacists</b>	a1, a2, d2, d4	<ul style="list-style-type: none"> <li>• definitions (pharmacy, pharmacist, drugs, medications, drug products)</li> <li>• pharmacy motto</li> <li>• Pharmacy profession missions</li> <li>• foundations of pharmacy (world , Asian, Arabic and Yemeni)</li> <li>• Relation of pharmacists with other health care professionals.</li> </ul>	2	4
2	<b>Current pharmacy practices</b>	a4, a2	<ul style="list-style-type: none"> <li>• Pharmacy career opportunities (academic, industrial, researcher , developer, hospital, clinical and community pharmacists)</li> </ul>	2	4
3	<b>Education of pharmacy</b>	a2	<ul style="list-style-type: none"> <li>• basic pharmacy sciences</li> <li>• academic Baccalaureate programs, higher programs.</li> </ul>	1	2
4	<b>Pharmacists as drug experts</b>	b1,	<ul style="list-style-type: none"> <li>• drugs benefits</li> <li>• drugs risks</li> <li>• Role of pharmacists as drug experts</li> <li>• sources of information (primary, secondary, tertiary).</li> </ul>	1	2
<b>MID-TERM EXAM</b>				1	2
5	<b>History of pharmacy</b>	a1, b2	History of pharmacy in : <ul style="list-style-type: none"> <li>○ in Sumerian,</li> <li>○ Egyptian</li> <li>○ Chinese, Indian,</li> <li>○ Roman, Greek</li> <li>○ Arabic and Islamic</li> <li>○ Western civilization</li> </ul>	5	10
6	<b>Future aspects of pharmacy</b>	a2, a3	<ul style="list-style-type: none"> <li>• factors influencing future of pharmacy</li> <li>• current development of pharmacy profession</li> <li>• newer pharmacy disciplines e.g. Complementary and alternative therapy, gene therapy and radiopharmacy</li> </ul>	2	4

Course Review and discussion session	1	2
FINAL - EXAM	1	2
<b>TOTAL</b>	16	32
<b>Number of Weeks /and Units Per Semester</b>	16 weeks	6 units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.

The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**lecture - Discussion**: a short lecture/ address followed by discussion

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**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VII. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search-report on one of the newer pharmacy disciplines.	a3	4-13	6
2	<b>Group</b> : each group of students will be assigned to do a search report on one of the famous ancient Muslim Pharmacist	c1	14	4

### VIII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5 %	a1, a2, a3, a4, b1, b2, c1, d1, d2
2	Assignments (1 + 2)	4, 14	10	2.5 %	a3, c1
3	Quiz 1 + Quiz 2	7, 12	5	2.5 %	b1, b2
4	Mid-semester exam of theoretical part ( written exam)	7	20	20 %	a1, a2, a4, b1, d2, d4
5	Final exam of theoretical part ( written exam)	17	60	60 %	a1, a2, a3, a4, b1, b2, c1, d1, d2
TOTAL			100	100 %	

### VIII. Learning Resources:

#### 1- Required Textbook(s) ( maximum two ).

1. Lillian M. Azzopardi . Lecture notes in pharmacy practice, 2010, pharmaceutical press

#### 2- Essential References.

2. Howard C. Ansel. Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems, , 2011, Lippincott Williams & Wilkins
3. Kevin M.G.Taylor. Pharmacy Practice, 2001, Taylor & Francis

#### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



IX.Course Policies:	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
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4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## ENGLISH LANGUAGE

I. Course Identification and General Information:						
1.	Course Title:	<b>ENGLISH LANGUAGE</b>				
2.	Course Code & Number:	<b>xxx 02</b>				
3.	Credit hours:	C.H				TOTAL
		L.	Tu.	S.	P	
		2	2	-	-	4
4.	Study level/ semester at which this course is offered:	<i>First Year – 1<sup>ST</sup> semester</i>				
5.	Pre –requisite (if any):	none				
6.	Co –requisite (if any):	none				
7.	Program (s) in which the course is offered:	All BC programs offered by the university				
8.	Language of teaching the course:	ENGLISH				
9.	Location of teaching the course:	IN THE UNIVERSITY				
10.	Prepared By:					
11.	Date of Approval	<b>9/2016</b>				

## II. Course Description:

This course provides the student with basic structure and grammars in English language.

<b>III. Program Intended learning outcomes (PILOs) &amp; the Course Intended learning outcomes (CILOs) and their alignment to teaching and assessment strategies</b>			
<b>A) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>			
PILOs	CILOs	Teaching strategies	Assessment Strategies
<b>A3</b>	<b>a1-</b> comperhind the basic grammars and rule of basic English	<b>lecture, Tutorial</b>	<b>written exam , assignments, quizzes</b>
<b>(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>			
PILOs	CILOs	Teaching strategies	Assessment Strategies
<b>B2</b>	<b>b1-</b> Differentiate between various English words & phrases	<b>lecture, Tutorial</b>	<b>written exam , assignments, quizzes</b>
<b>(C)Alignment Course Intended Learning Outcomes of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>			
PILOs	CILOs	Teaching strategies	Assessment Strategies
<b>C4</b>	<b>c1-</b> Effectively & correctly use language grammars & fundamental skills (reading, writing and speech) to present thoughts/ideas.	<b>lecture, Tutorial</b>	<b>written exam , assignments, quizzes</b>
<b>(D) Alignment Course Intended Learning Outcomes of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>			
PILOs	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
<b>D3</b>	<b>d1-</b> demonstrate self learning and time management skills.	<b>lecture, Tutorial</b>	<b>assignments</b>

<b>IV. Course Content:</b>					
<b>A – Theoretical Aspect:</b>					
<b>Order</b>	<b>Units/Topics List</b>	<b>Learning Outcomes</b>	<b>Sub Topics List</b>	<b>Number of Weeks</b>	<b>contact hours</b>
1	Basic English	b1, c1, d1	<ul style="list-style-type: none"> <li>English letters : A to Z, capitals, small letters</li> <li>Classification of words               <ul style="list-style-type: none"> <li>Nouns</li> <li>Articles</li> <li>Pronouns</li> <li>Quantity</li> <li>Adjective</li> <li>Adverbs</li> <li>Prepositions</li> </ul> </li> <li>verbs : Be, have, do , Modal auxiliaries and related verbs</li> </ul>	4	12
2	The sentence	b1, c1, d1	<ul style="list-style-type: none"> <li>Simple, compound, complex</li> <li>Passive and causative</li> <li>Questions, answers, negatives</li> <li>Conditional sentences</li> <li>Direct and indirect speech</li> <li>The infinitive and the "ing" form</li> </ul>	3	12
			MID-SEMESTER EXAM	1/2	2
3	Tenses	b1, c1, d1	<ul style="list-style-type: none"> <li>Past simple</li> </ul>	1/2	2
			<ul style="list-style-type: none"> <li>Past perfect</li> <li>Past continuous (progressive)</li> <li>Present simple</li> <li>Present perfect</li> <li>Present continuous(progressive)</li> <li>Future simple</li> <li>Future perfect</li> <li>Future continuous (progressive)</li> </ul>	7	28
			Total	15	56
<b>Number of Weeks /and Units Per Semester</b>				<b>15</b>	<b>3</b>

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

## VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Tutorial exercises	b1, c1, d1	3	2
2	Homework Exercises	b1, c1, d1	7	1

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5 %	b1, c1, d1
2	Assignments (1 + 2)	4, 14	10	10 %	b1, c1, d1
3	Quiz 1 + Quiz 2	7, 12	5	5 %	b1, c1, d1
4	Mid-semester exam of theoretical part ( written exam)	7	20	20 %	b1, c1, d1
5	Final exam of theoretical part ( written exam)	17	60	60 %	b1, c1, d1
TOTAL			100	100 %	

<b>VII. Learning Resources:</b>	
<b>1- Required Textbook(s) ( maximum two ).</b>	
L.G. Alexander, 2007, Longman English grammar practice, , Longman Group, UK	
<b>2- Essential References.</b>	
Mary Lou, 2011, The English Teacher’s Survival Guide: Ready-To-Use Techniques & Materials for Grades 7-12 , 2nd Edition, Jossey-Bass teachers, USA	
<b>3- Electronic Materials and Web Sites etc.</b>	
www.ego4u.com/	

<b>VIII. Course Policies:</b>	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of ENGLISH LANGUAGE

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail				12- 1		10 -11	

II. Course Description:
This course provides the student with basic structure and grammars in English language.

<b>III. Program Intended learning outcomes (PILOs) &amp; the Course Intended learning outcomes (CILOs) and their alignment to teaching and assessment strategies</b>			
<b>A) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>			
PILOs	CILOs	Teaching strategies	Assessment Strategies
<b>A3</b>	<b>a1-</b> comperhind the basic grammars and rule of basic English	<b>lecture, Tutorial</b>	<b>written exam , assignments, quizzes</b>
<b>(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>			
PILOs	CILOs	Teaching strategies	Assessment Strategies
<b>B2</b>	<b>b1-</b> Differentiate between various English words & phrases	<b>lecture, Tutorial</b>	<b>written exam , assignments, quizzes</b>
<b>(C)Alignment Course Intended Learning Outcomes of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>			
PILOs	CILOs	Teaching strategies	Assessment Strategies
<b>C4</b>	<b>c1-</b> Effectively & correctly use language grammars & fundamental skills (reading, writing and speech) to present thoughts/ideas.	<b>lecture, Tutorial</b>	<b>written exam , assignments, quizzes</b>
<b>(D) Alignment Course Intended Learning Outcomes of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>			
PILOs	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
<b>D3</b>	<b>d1-</b> demonstrate self learning and time management skills.	<b>lecture, Tutorial</b>	<b>assignments</b>



<b>IV. Course Content:</b>					
<b>Order</b>	<b>Units/Topics List</b>	<b>Learning Outcomes</b>	<b>Sub Topics List</b>	<b>Number of Weeks</b>	<b>contact hours</b>
<b>1</b>	<b>Basic English</b>	b1, c1, d1	<ul style="list-style-type: none"> <li>• English letters : A to Z, capitals, small letters</li> <li>• Classification of words               <ul style="list-style-type: none"> <li>○ Nouns</li> <li>○ Articles</li> <li>○ Pronouns</li> <li>○ Quantity</li> <li>○ Adjective</li> <li>○ Adverbs</li> <li>○ Prepositions</li> </ul> </li> <li>• verbs : Be, have, do , Modal auxiliaries and related verbs</li> </ul>	4	12
<b>2</b>	<b>The sentence</b>	b1, c1, d1	<ul style="list-style-type: none"> <li>• Simple, compound, complex</li> <li>• Passive and causative</li> <li>• Questions, answers, negatives</li> <li>• Conditional sentences</li> <li>• Direct and indirect speech</li> <li>• The infinitive and the "ing" form</li> </ul>	3	12
			<b>MID-SEMESTER EXAM</b>	1/2	2
<b>3</b>	<b>Tenses</b>	b1, c1, d1	<ul style="list-style-type: none"> <li>• Past simple</li> <li>• Past perfect</li> <li>• Past continuous (progressive)</li> <li>• Present simple</li> <li>• Present perfect</li> <li>• Present continuous(progressive)</li> <li>• Future simple</li> <li>• Future perfect</li> <li>• Future continuous (progressive)</li> </ul>	7	28
			<b>Total</b>	<b>15</b>	<b>56</b>
<b>Number of Weeks /and Units Per Semester</b>				<b>15</b>	<b>3</b>

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

## VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Tutorial exercises	b1, c1, d1	3	2
2	Homework Exercises	b1, c1, d1	7	1

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5 %	b1, c1, d1
2	Assignments (1 + 2)	4, 14	10	10 %	b1, c1, d1
3	Quiz 1 + Quiz 2	7, 12	5	5 %	b1, c1, d1
4	Mid-semester exam of theoretical part ( written exam)	7	20	20 %	b1, c1, d1
5	Final exam of theoretical part ( written exam)	17	60	60 %	b1, c1, d1
TOTAL			100	100 %	

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
L.G. Alexander, 2007, Longman English grammar practice, , Longman Group, UK
<b>2- Essential References.</b>
Mary Lou, 2011, The English Teacher’s Survival Guide: Ready-To-Use Techniques & Materials for Grades 7-12 , 2nd Edition, Jossey-Bass teachers, USA
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.ego4u.com/">www.ego4u.com/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification of " ISLAMIC CULTURE"

I. Course Identification and General Information:						
1	Course Title:	Islamic culture				
2	Course Code &Number:	xxx 03				
3	Credit hours: 2	C.H			TOTAL	
		Th.	Seminar	Pr		Tr.
		2	-	-	-	2
4	Study level/ semester at which this course is offered:	First year/Second semester				
5	Pre –requisite:					
6	Co –requisite :	-				
7	Program (s) in which the course is offered:	Pharmacy BC				
8	Language of teaching the course:	Arabic				
9	Location of teaching the course:	College of medical Science				
10	Prepared By:					
11	Date of Approval	2016				

II. Course Description:	
<p>صمم هذا المقرر لتزويد الطالب بالمعارف, والمهارات, والاتجاهات السلوكية, اللازمة في مجال الثقافة والأخلاقيات الإسلامية المهنية, والتي تمكنه من التحلي بأخلاقيات الإسلام, والصفات التي تميزه عن غيره - في هذا المجال- , والابتعاد عن المفسدات, ومحاولة تعزيز الثوابت, وإزالة السلبيات.</p>	

### III. Intended learning outcomes (ILOs) of the course:

#### (A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
A1	a1. الإلمام بالقوانين الطبية واللوائح المنظمة للمهنة ودورها في حماية الحياة.	Lecture Discussion	Essay type Short answer Objective type
A4	a2. إدراك أهمية تجنب الأخطاء في المهنة وعقوبتها في الشرع والقانون.	Lecture Discussion	Essay type Short answer Objective type

#### (B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
B1	b1. تفسير رأي الإسلام في بعض القضايا المعاصرة، وكيفية التعامل معها.	Lecture Discussion	Essay type Short answer Objective type

#### (D) Alignment Course Intended Learning Outcomes of General and Transferable Skills to Teaching Strategies and Assessment Strategies:

PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
D2	d1. تميز مبادئ الإسلام في تأسيس الأسرة واستمرارها وإكساب الطلبة بعض المفاهيم العامة للأخلاقيات الإسلامية، وأثرها في حياة الأفراد.	Lecture Discussion	Essay type Short answer Objective type

IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/Topics List	Sub Topics List	No. of Weeks	Contact hours	Learning Outcomes
1	تعريف الثقافة والحضارة	<ul style="list-style-type: none"> <li>▪ تعريف الثقافة – الثقافة الإسلامية.</li> <li>▪ تعريف الحضارة ومكوناتها، ومظاهرها.</li> <li>▪ الفرق بين الثقافة والحضارة.</li> <li>▪ مصادر الثقافة الإسلامية.</li> <li>▪ خصائص الثقافة الإسلامية.</li> </ul>	2	4	b1
2	النظام العقدي في الإسلام	<ul style="list-style-type: none"> <li>▪ تعريف العقيدة.</li> <li>▪ أركان العقيدة الإسلامية.</li> <li>▪ أثر العقيدة على الفرد والمجتمع.</li> </ul>	1	2	b1
3	النظام الاجتماعي في الإسلام	<ul style="list-style-type: none"> <li>▪ تعريف النظام الاجتماعي.</li> <li>▪ تعريف الأسرة وأهميتها، ومظاهر اهتمام الإسلام بالأسرة.</li> <li>▪ مبادئ الإسلام في تأسيس الأسرة واستمرارها:</li> <li>- مبادئ تراعى قبل الإقدام على الزواج.</li> <li>- مبادئ تراعى بعد الزواج.</li> <li>- مبادئ تراعى عند حصول زعزعة أو خلاف أسري.</li> </ul>	1	2	d1
5	النظام السياسي في الإسلام:	<ul style="list-style-type: none"> <li>▪ مفهوم النظام السياسي.</li> <li>▪ أسس النظام السياسي في الإسلام:-</li> <li>- السيادة للشرع- السلطة للأمة.</li> <li>- للأمة حاكم واحد. - الشورى.</li> <li>- واجبات الحاكم وحقوقه في النظام السياسي.</li> </ul>	1	2	b1
6	النظام الأخلاقي في الإسلام	<ul style="list-style-type: none"> <li>▪ تعريف الأخلاق ومكانتها في الإسلام.</li> <li>▪ الأخلاق كما وردت في القرآن الكريم.</li> <li>▪ الأخلاق كما وردت في السنة النبوية.</li> </ul>	1	2	d1
		<ul style="list-style-type: none"> <li>▪ مفهوم أخلاقيات المهنة.</li> <li>▪ مصادر وأهمية أخلاقيات المهنة.</li> <li>▪ تصنيف القيم الأخلاقية المهنية.</li> </ul>	1	2	

7		▪ امتحان نصف الفصل	1	2	b1, d1
8	هدي الإسلام في الصحة والحفاظ عليها	▪ الإسلام والصحة. ▪ الطب الوقائي في الإسلام.	1	2	a1, a2, b1
9	أحكام شرعية وأخلاقية في بعض القضايا	▪ الاجهاض - عمليات التجميل - نقل الدم ▪ زراعة الأعضاء - الاستنساخ - وسائل منع الحمل.	2	4	a1, a2, b1
10	تابع أحكام شرعية وأخلاقية في بعض القضايا	▪ تشريح الجثث - الموت الرحيم - الدواء والصوم. ▪ الأدوية والإدمان - التداوي بالأعشاب.	1	2	a1, a2, b1
11	بعض المشكلات المعاصرة وكيف عالجها الإسلام	▪ سوء التغذية. - انتشار الأمراض المعدية. ▪ حكم وأثر ممارسة بعض العادات الضارة: • المخدرات - المهدئات. • اللواط. - العادة السرية.	1	2	a1, a2, b1
12	قضايا معاصرة	▪ الغزو الفكري - الشورى في الإسلام - حقوق الإنسان في الإسلام.	1	2	a1, a2, b1
13		امتحان نهائي	1	2	a1, a2, b1, d1
<b>Number of Weeks /and Units Per Semester</b>			<b>15</b>	<b>30</b>	

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
	<b>Not applicable</b>	-	-	-
<b>Number of Weeks /and Units Per Semester</b>				

<b>V. Teaching strategies of the course:</b>
1. Lecture - Discussion

## VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	عادات وتقاليد الزواج في قريتك	D5	3-8	5

## VII. Schedule of Assessment Tasks for Students During the Semester Theoretical part

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and Activities	15th week	5	5%	a1, a2, b1, d1
2	Student assignment	5th and 12th week	5	5%	d1
3	Mid-term exam	7th or 8th week	20	20%	b1, d1
4	Final exam	16th-17th week	70	70 %	a1, a2, b1, d1
<b>Total Theory Weight</b>			<b>100</b>	<b>100%</b>	

## Practical part

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
	Not applicable	-	-	-	-

## VIII. Learning Resources:

1- Required Textbook(s)	
	1- الثقافة الإسلامية للدكتور/ عبد الحكيم بن عبد اللطيف السروري. 2- أضواء على الثقافة الإسلامية د/ علي محمد الأهدل و د/ عبد الحكيم السروري.
2- Essential References.	
	1- الثقافة الإسلامية د/ عبد الغني حيدر. 2- الموسوعة الفقهية الطبية د/ محمد أحمد كنعان. 3- قانون الجرائم والعقوبات اليمني د/ علي حسن الشرفي
3- Electronic Materials and Web Sites etc.	
	1. <a href="http://www.google.com">www.google.com</a>



IX. Course Policies:	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of INTRODUCTION TO ISLAMIC CULTURE

I. Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

## II. Course Description:

صمم هذا المقرر لتزويد الطالب بالمعارف, والمهارات, والاتجاهات السلوكية, اللازمة في مجال الثقافة والأخلاقيات الإسلامية المهنية, والتي تمكنه من التحلي بأخلاقيات الإسلام, والصفات التي تميزه عن غيره - في هذا المجال- , والابتعاد عن المفسدات, ومحاولة تعزيز الثوابت, وإزالة السلبات.

## III. Intended learning outcomes (ILOs) of the course:

<b>(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:</b>			
PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
A1	a1. الإمام بالقوانين الطبية واللوائح المنظمة للمهنة ودورها في حماية الحياة.	Lecture Discussion	Essay type Short answer Objective type
A4	a2. إدراك أهمية تجنب الأخطاء في المهنة وعقوبتها في الشرع والقانون.	Lecture Discussion	Essay type Short answer Objective type
<b>(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies

B1	b1 تفسير رأي الإسلام في بعض القضايا المعاصرة، وكيفية التعامل معها.	Lecture Discussion	Essay type Short answer Objective type
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(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
	Not applicable	-	-
(D) Alignment Course Intended Learning Outcomes of General and Transferable Skills to Teaching Strategies and Assessment Strategies:			
PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
D1	d1. تميز مبادئ الإسلام في تأسيس الأسرة واستمرارها وإكساب الطلبة بعض المفاهيم العامة للأخلاقيات الإسلامية، وأثرها في حياة الأفراد.	Lecture Discussion	Essay type Short answer Objective type

IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/Topics List	Sub Topics List	No. of Weeks	Contact hours	Learning Outcomes
1	تعريف الثقافة والحضارة	<ul style="list-style-type: none"> <li>▪ تعريف الثقافة – الثقافة الإسلامية.</li> <li>▪ تعريف الحضارة ومكوناتها، ومظاهرها.</li> <li>▪ الفرق بين الثقافة والحضارة.</li> <li>▪ مصادر الثقافة الإسلامية.</li> <li>▪ خصائص الثقافة الإسلامية.</li> </ul>	2	4	b1
2	النظام العقدي في الإسلام	<ul style="list-style-type: none"> <li>▪ تعريف العقيدة.</li> <li>▪ أركان العقيدة الإسلامية.</li> </ul>	1	2	b1

		<ul style="list-style-type: none"> <li>أثر العقيدة على الفرد والمجتمع.</li> </ul>			
3	النظام الاجتماعي في الإسلام	<ul style="list-style-type: none"> <li>تعريف النظام الاجتماعي.</li> <li>تعريف الأسرة وأهميتها، ومظاهر اهتمام الإسلام بالأسرة.</li> <li>مبادئ الإسلام في تأسيس الأسرة واستمرارها:</li> <li>- مبادئ تراعى قبل الإقدام على الزواج.</li> <li>- مبادئ تراعى بعد الزواج.</li> <li>- مبادئ تراعى عند حصول زعزعة أو خلاف أسري.</li> </ul>	1	2	d1
5	النظام السياسي في الإسلام:	<ul style="list-style-type: none"> <li>مفهوم النظام السياسي.</li> <li>أسس النظام السياسي في الإسلام:-</li> <li>- السيادة للشرع- السلطة للأمة.</li> <li>- للأمة حاكم واحد - الشورى.</li> <li>- واجبات الحاكم وحقوقه في النظام السياسي.</li> </ul>	1	2	b1
6	النظام الأخلاقي في الإسلام	<ul style="list-style-type: none"> <li>تعريف الأخلاق ومكانتها في الإسلام.</li> <li>الأخلاق كما وردت في القرآن الكريم.</li> <li>الأخلاق كما وردت في السنة النبوية.</li> </ul>	1	2	d1
		<ul style="list-style-type: none"> <li>مفهوم أخلاقيات المهنة.</li> <li>مصادر وأهمية أخلاقيات المهنة.</li> <li>تصنيف القيم الأخلاقية المهنية.</li> </ul>	1	2	
7		<ul style="list-style-type: none"> <li>امتحان نصف الفصل</li> </ul>	1	2	b1, d1
8	هدي الإسلام في الصحة والحفاظ عليها	<ul style="list-style-type: none"> <li>الإسلام والصحة.</li> <li>الطب الوقائي في الإسلام.</li> </ul>	1	2	a1, a2, b1
9	أحكام شرعية وأخلاقية في بعض القضايا	<ul style="list-style-type: none"> <li>الاجهاض - عمليات التجميل - نقل الدم</li> <li>زراعة الأعضاء - الاستنساخ - وسائل منع الحمل.</li> </ul>	2	4	a1, a2, b1
10	تابع أحكام شرعية وأخلاقية في بعض القضايا	<ul style="list-style-type: none"> <li>تشريح الجثث - الموت الرحيم - الدواء والصوم.</li> <li>الأدوية والإدمان - التداوي بالأعشاب.</li> </ul>	1	2	a1, a2, b1

11	بعض المشكلات المعاصرة وكيف عالجها الإسلام	<ul style="list-style-type: none"> <li>▪ سوء التغذية. - انتشار الأمراض المعدية.</li> <li>▪ حكم وأثر ممارسة بعض العادات الضارة: <ul style="list-style-type: none"> <li>• المخدرات - المهدئات.</li> <li>- اللواط. - العادة السرية.</li> </ul> </li> </ul>	1	2	a1, a2, b1
12	قضايا معاصرة	<ul style="list-style-type: none"> <li>▪ الغزو الفكري - الشورى في الإسلام - حقوق الإنسان في الإسلام.</li> </ul>	1	2	a1, a2, b1
13	امتحان نهائي		1	2	a1, a2, b1, d1
<b>Number of Weeks /and Units Per Semester</b>			<b>15</b>	<b>30</b>	

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
	<b>Not applicable</b>	-	-	-
<b>Number of Weeks /and Units Per Semester</b>				

<b>V. Teaching strategies of the course:</b>
2. Lecture - Discussion

<b>VI. Assignments:</b>				
No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	عادات وتقاليد الزواج في قرينتك	D5	3-8	5

## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and Activities	15th week	5	5%	a1, a2, b1, d1
2	Student assignment	5th and 12th week	5	5%	d1
3	Mid-term exam	7th or 8th week	20	20%	b1, d1
4	Final exam	16th-17th week	70	70 %	a1, a2, b1, d1
<b>Total Theory Weight</b>			<b>100</b>	<b>100%</b>	

### Practical part

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
	<b>Not applicable</b>	-	-	-	-

## VIII. Learning Resources:

1- Required Textbook(s)	
	3- الثقافة الإسلامية للدكتور/ عبد الحكيم بن عبد اللطيف السروري. 4- أضواء على الثقافة الإسلامية د/ علي محمد الأهدل و د/ عبد الحكيم السروري.
2- Essential References.	
	4- الثقافة الإسلامية د/ عبد الغني حيدر. 5- الموسوعة الفقهية الطبية د/ محمد أحمد كنعان. 6- قانون الجرائم والعقوبات اليمني د/ علي حسن الشرفي
3- Electronic Materials and Web Sites etc.	
	2. <a href="http://www.google.com">www.google.com</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
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2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp;Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.

## Course Specification " COMPUTER SKILLS"

I.	II. Course Identification and General Information:						
1.	Course Title:	<b>Computer Skills</b>					
2.	Course Code & Number:	<b>xxx 04</b>					
3.	Credit hours:	C.H					TOTAL
		L.	Tut.	S.	P.	Tr.	
		2	-	-	1	-	
4.	Study level/ semester at which this course is offered:	<i>( first ) Year – ( 1<sup>st</sup> ) semester</i>					
5.	Pre –requisite (if any):	None					
6.	Co –requisite (if any):	None					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10.	Prepared By:						
11.	Date of Approval	<b>10/2016</b>					



## I. Course Description:

This course is designed for students to develop basic understanding of uses of computer and its applications in nursing.

## II. Intended learning outcomes (ILOs) of the course:

1. Discuss various concepts used in computer and the disk operating system.
2. Recognize features of computer aided teaching and testing.
3. Uses operating system, MS Office, multi-media, internet and Email.
4. Describe the use of hospital management system.

### (A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
A1. Discuss various concepts used in computer and the disk operating system.	Lecture discussion Demonstration	Short answers Objective type

### (B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
B1. Recognize features of computer aided teaching and testing.	Lecture discussion Demonstration	Short answers Objective type

### C. Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
C6. Uses operating system, MS Office, multi-media, internet and Email.	Lecture Discussion Demonstration Practice Session	Short answer questions Objective type Practical Exam

### (D) Alignment Course Intended Learning Outcomes of General and Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
D4. Describe the use of hospital management system.	Lecture Discussion Demonstration Practice Session	Short answer questions Objective type Practical Exam

### III. Course Content:

#### A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	No. of Weeks	Contact hours	Learning Outcomes
1	Introduction	<ul style="list-style-type: none"> <li>▪ Concepts of Computers</li> <li>▪ Hardware and software; trends and technology</li> </ul>	2	4	A1
2	Introduction to disk-operating system	<ul style="list-style-type: none"> <li>▪ DOS</li> <li>▪ Windows (all version)</li> <li>▪ Introduction to MS-Word</li> <li>▪ MS-Excel with pictorial presentation</li> <li>▪ MS-Access</li> <li>▪ MS-Power point</li> </ul>	6	12	A1
3	Midterm exam		1	2	A1
4	Multimedia	<ul style="list-style-type: none"> <li>▪ Types &amp; uses</li> <li>▪ Computer aided teaching &amp; testing.</li> </ul>	2	4	B1
5	Internet and e-mail	<ul style="list-style-type: none"> <li>▪ Internet</li> <li>▪ e-mail</li> </ul>	2	4	B1
6	Hospital Management System	<ul style="list-style-type: none"> <li>▪ Types</li> <li>▪ Uses</li> </ul>	1	2	D4
7	Final exam		1	2	A1, B1, D4
<b>Number of Weeks /and Units Per Semester</b>			<b>15</b>	<b>30</b>	

#### IV. Teaching strategies of the course:

1. Lecture - Discussion
2. Demonstration
3. Student assignment
4. Practical session

#### V. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Application of computers in community health	A1, B1,C6	2-10	5

#### VI. Schedule of Assessment Tasks for Students during the Semester: Theoretical part

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and Activities	15th week	5	5%	A1, B1,D4
2	Student assignment	5th and 12th week	5	5%	A1, B1,C6
3	Mid-term exam	7th or 8th week	10	10%	A1
4	Final exam	16th-17th week	40	40 %	A1, B1,D4
<b>Total Theory Weight</b>			<b>60</b>	<b>60%</b>	

Practical part					
Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and Attitude	14 <sup>th</sup> week	5	5%	C6
2	Semester work	1 <sup>st</sup> and 14 <sup>th</sup> week	10	10%	C6
3	Final exam (theory or oral )	15 <sup>th</sup> week	5	5%	C6
4	Final exam (practical)	16 <sup>th</sup> -17 <sup>th</sup> week	20	20%	C6
<b>Total Practical Weight</b>			<b>40</b>	<b>40%</b>	

VIII. Learning Resources:	
<b>1- Required Textbook(s) (maximum two ).</b>	
	1. N.K. Anand & Shikha Goel (2009). Computers for Nurses, A.I.T.B.S. Publishers ,India.
<b>2- Essential References.</b>	
	2. Thacker N (2009). Computers for Nurses, India.
<b>3- Electronic Materials and Web Sites etc.</b>	
	1. www.google.com 2. www.yahoo.com

<b>IX. Course Policies:</b>	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of " COMPUTER SKILLS"

I. Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail			X				

II. Course Identification and General Information:						
1.	Course Title:	Computer Skills				
2.	Course Number & Code:	xxx04				
3.	Credit hours: 3	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2	-	1		3
4.	Study level/year at which this course is offered:	First year/First semester				
5.	Pre –requisite:	--				
6.	Co –requisite :	--				
7.	Program (s) in which the course is offered	Community health				
8.	Language of teaching the course:	English				
9.	System of Study:	Semester system				
10	Mode of delivery:	Full time				
11	Location of teaching the course:	College of medical Science				

III. Course Description:	
This course is designed for students to develop basic understanding of uses of computer and its applications in nursing.	

#### IV. Intended learning outcomes (ILOs) of the course:

1. Recognize various concepts used in computer, the disk operating system, features of computer aided teaching and testing and statistical packages.
2. Uses operating system, MS Office, multi-media, internet and Email.
3. Describe the use of hospital management system.

#### V. Course Content:

Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

##### A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	Introduction	1-2	4
2	Introduction to disk- operating system	3-8	12
3	Midterm exam	9	2
4	Multimedia	10-11	4
5	Internet and e-mail	12-13	4
6	Hospital Management System	14	2
7	Final exam	15	2
<b>Number of Weeks /and Units Per Semester</b>		<b>15</b>	<b>30</b>

##### B– Practical Aspect:

Order	Topics List	Week Due	Contact Hours
1	Use of MS Office	1-6	12
2	Use multi-media	7-8	4
3	Use of internet and Email	9-10	4
4	Use of hospital management system	11-12	4
<b>Number of Weeks /and Units Per Semester</b>		<b>12</b>	<b>24</b>

<b>VI. Teaching strategies of the course:</b>
1. Lecture - Discussion
2. Demonstration
3. Student assignments
4. Practical session

<b>VII. Assignments:</b>				
No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Application of computers in nursing	A1, B1,C6	2-10	5

<b>VIII. Schedule of Assessment Tasks for Students during the Semester:</b>					
<b>Theoretical part</b>					
No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and Activities	15th week	5	5%	A1, B1,D4
2	Student assignment	5th and 12th week	5	5%	A1, B1,C6
3	Mid-term exam	7th or 8th week	10	10%	A1
4	Final exam	16th-17th week	40	40 %	A1, B1,D4
<b>Total Theory Weight</b>			<b>60</b>	<b>60%</b>	



Practical part					
Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and Attitude	14 <sup>th</sup> week	5	5%	C6
2	Semester work	1 <sup>st</sup> and 14 <sup>th</sup> week	10	10%	C6
3	Final exam (theory or oral )	15 <sup>th</sup> week	5	5%	C6
4	Final exam (practical)	16 <sup>th</sup> -17 <sup>th</sup> week	20	20%	C6
<b>Total Practical Weight</b>			<b>40</b>	<b>40%</b>	

## IX. Learning Resources:

1- Required Textbook(s)	
	1. N.K. Anand & Shikha Goel (2009). Computers for Nurses, A.I.T.B.S. Publishers , India.
2- Essential References.	
	1. Thacker N (2009). Computers for Nurses, India.
3- Electronic Materials and Web Sites etc.	
	1. www.google.com 2. www.yahoo.com

## X. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually

	unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.

## Course Specification of " ARABIC LANGUAGE"

I. Course Identification and General Information:						
1	Course Title:	Arabic Language				
2	Course Code &Number:	xxx01				
3	Credit hours: 2	C.H			TOTAL	
		Th.	Seminar	Pr		Tr.
		2	-	-	-	2
4	Study level/ semester at which this course is offered:	First year/First semester				
5	Pre –requisite:					
6	Co –requisite :	-				
7	Program (s) in which the course is offered:	Pharmacy bachelor				
8	Language of teaching the course:	Arabic				
9	Location of teaching the course:	College of medical Science				
10	Prepared By:					
11	Date of Approval	2017				

II. Course Description:	
<p>دراسة اللغة العربية من خلال نصوص أدبيه وتطبيقات نحوية ، يأخذ أنماط من النصوص الأدبية والشعرية والنثرية من مختلف العصور الأدبية، ثم استخراج الشواهد النحوية لغرض التطبيق.</p>	

<b>(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
Not applicable	-	-
<b>(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
Not applicable	-	-

<b>(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>			
PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
C4	c1. الإلمام بأشهر أبواب النحو التي يستقيم بها اللسان ويعتبر من سلامة القول منطوقاً ومكتوباً.	Lecture Discussion	<ul style="list-style-type: none"> <li>• امتحان</li> <li>• تحريري</li> <li>• تكاليف</li> <li>• أسئلة تقييم</li> </ul>
<b>(D) Alignment Course Intended Learning Outcomes of General and Transferable Skills to Teaching Strategies and Assessment Strategies:</b>			
PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
D3	d1. اكتساب لغة جيدة للتمكن من التواصل مع المرضى موع أفراد الفريق الطبي	Lecture Discussion	<ul style="list-style-type: none"> <li>• تكاليف</li> <li>• أسئلة تقييم</li> </ul>

IV. Course Content:					
Order	Units/Topics List	Sub Topics List	No. of Weeks	Contact hours	Learning Outcomes
1	مهاره القراءة الجهريه	<ul style="list-style-type: none"> <li>■ قراءة نصوص نثرية وشعرية</li> <li>■ تدريبات صفيه</li> </ul>	3	6	c1, d1
2	مهاره القراءة الصامته	<ul style="list-style-type: none"> <li>■ قراءة نصوص نثرية وشعرية</li> <li>■ تدريبات صفيه</li> </ul>	3	6	c1, d1
		اختبار نصف الفصل	1	2	c1, d1
3	مهاره الكتابة الوظيفية	<ul style="list-style-type: none"> <li>■ كتابة الرسالة الإدارية</li> <li>■ تدريبات صفيه</li> </ul>	4	8	c1, d1
4	الكتابة الوظيفية	<ul style="list-style-type: none"> <li>■ كتابة التقرير</li> <li>■ تدريبات صفيه</li> </ul>	4	8	c1, d1
11		امتحان نهائي	1	2	c1, d1
<b>Number of Weeks /and Units Per Semester</b>			<b>16</b>	<b>32</b>	

#### V. Teaching strategies of the course:

1. Lecture
2. Lecture discussion (Tutorial)

#### VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	■ كتابة التقرير (تكليف جماعي)	c1, d1	6-8	2.5

### VII. Schedule of Assessment Tasks for Students During the Semester Theoretical part

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and Activities	15th week	5	5%	B1,C6
2	Student assignment	5th and 12th week	5	5%	B1,C6
3	Mid-term exam	7th or 8th week	20	20%	B1,C6
4	Final exam	16th-17th week	70	70 %	B1,C6

Practical part					Aligned Course Learning Outcomes
Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
	Not applicable	-	-	-	-

### VIII. Learning Resources:

1- Required Textbook(s)	
	1. تاريخ الأدب العربي / د. أحمد حسن الزيات . 2. المصادر الأدبية واللغوية في التراث العربي / د. عز الدين إسماعيل.
2- Essential References.	
	1. الأدب العربي الحديث / د. محمد صالح الشطبي.
3- Electronic Materials and Web Sites etc.	
	1. www.google.com 2. www.yahoo.com

### IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> Any student who is late for more than 30

	minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of "ARABIC LANGUAGE I "

I. Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location&Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail						X	

II. Course Description:
دراسة اللغة العربية من خلال نصوص أدبيه وتطبيقات نحوية ، يأخذ أنماط من النصوص الأدبية والشعرية والنثرية من مختلف العصور الأدبية ، ثم استخراج الشواهد النحوية لغرض التطبيق.

II. COURSE INTENDED LARNING OUTCOMES			
<b>(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:</b>			
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies	
Not applicable	-	-	
<b>(B) Alignment Course Intended Learning Outcomes of Intellectual Skillsto Teaching Strategies and Assessment Strategies:</b>			
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies	
Not applicable	-	-	
<b>(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>			
PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
C4	c1.الإلمام بأشهر أبواب النحو التي يستقيم بها اللسان ويعتبر من سلامة القول منطوقاً ومكتوباً.	Lecture Discussion	<ul style="list-style-type: none"> <li>• امتحان</li> <li>• تحريري</li> <li>• تكاليف</li> <li>• أسئلة تقييم</li> </ul>
<b>(D) Alignment Course Intended Learning Outcomes of</b>			



General and Transferable Skills to Teaching Strategies and Assessment Strategies:			
PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
D3	d1. اكتساب لغة جيدة للتمكن من التواصل مع المرضى موع أفراد الفريق الطبي	Lecture Discussion	<ul style="list-style-type: none"> <li>تكاليف</li> <li>أسئلة تقييم</li> </ul>

IV. Course Content:					
Order	Units/Topics List	Sub Topics List	No. of Weeks	Contact hours	Learning Outcomes
1	مهاره القراءة الجهرية	<ul style="list-style-type: none"> <li>قراءة نصوص نثرية وشعرية</li> <li>تدريبات صفية</li> </ul>	3	6	c1, d1
2	مهاره القراءة الصامتة	<ul style="list-style-type: none"> <li>قراءة نصوص نثرية وشعرية</li> <li>تدريبات صفية</li> </ul>	3	6	c1, d1
		اختبار نصف الفصل	1	2	c1, d1
3	مهاره الكتابة الوظيفية	<ul style="list-style-type: none"> <li>كتابة الرسالة الإدارية</li> <li>تدريبات صفية</li> </ul>	4	8	c1, d1
4	الكتابة الوظيفية	<ul style="list-style-type: none"> <li>كتابة التقرير</li> <li>تدريبات صفية</li> </ul>	4	8	c1, d1
11		امتحان نهائي	1	2	c1, d1
<b>Number of Weeks /and Units Per Semester</b>			<b>16</b>	<b>32</b>	

## V. Teaching strategies of the course:

1. Lecture
2. Lecture discussion (Tutorial)

## VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	كتابة التقرير (تكليف جماعي)	c1, d1	8-12	5

## VII. Schedule of Assessment Tasks for Students During the Semester Theoretical part

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and Activities	15th week	5	5%	c1, d1
2	Student assignment	5th and 12th week	5	5%	c1, d1
3	Mid-term exam	7th or 8th week	20	20%	c1, d1
4	Final exam	16th-17th week	70	70 %	c1, d1

## VIII. Learning Resources:

1- Required Textbook(s)	
	1. تاريخ الأدب العربي / د. أحمد حسن الزيات . 2. المصادر الأدبية واللغوية في التراث العربي / د. عز الدين إسماعيل.
2- Essential References.	
	3. الأدب العربي الحديث / د. محمد صالح الشطبي.
3- Electronic Materials and Web Sites etc.	
	4. www.google.com 5. www.yahoo.com

<b>IX. Course Policies:</b>	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.

## Course Specification

### COMMUNICATION SKILLS

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	<b>COMMUNICATION SKILLS</b>					
2.	Course Code & Number:	<b>MSC 03</b>					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		1	1	-	-		-
4.	Study level/ semester at which this course is offered:	( <i>FIRST</i> ) Year – ( <i>2<sup>ND</sup></i> ) semester					
5.	Pre –requisite (if any):	• Nil					
6.	Co –requisite (if any):	• Nil					
7.	Program (s) in which the course is offered:	<b>All BC programs offered by the university</b>					
8.	Language of teaching the course:	<b>ENGLISH</b>					
9.	Location of teaching the course:	<b>IN THE UNIVERSITY</b>					
10	Prepared By:						
11	Date of Approval	<b>10/2016</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course focuses on study of skills necessary for better communication with patients , health care members and community .

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Define communication and communication media.
2.		a2. Determine the main types of communication media
3.	A3	a3. Discuss the techniques for effective communication
4.	A4	a4. Recognize his/her role as pharmacist in effectively communicating with patients and health care team
5.	B1	b1. Interpret signs of non-verbal communication.
6.	B2	b2. Compare between various techniques of effective communication
7.	B3	b3. Predict the person status from his/her body language.
8.	C4	c1 .Properly search for information related to communication techniques using books and suitable media technologies.
9.		c2. Report his/her work efficiently.
10.	D1	d1. Share successfully in team-work.
11.	D5	d2. Demonstrate self-learning and time management .

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture	written exam , Practical assessment (Lab accomplishments, Lab. Reporting , practical exam)
a4	lectures	written exam , assignment
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	lecture	Written exam, quiz
b2	Lecture	written exam , quiz
b3	Lecture	written exam
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Feed-back learning ,Group-project.	Written- exam , assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Group-project , feed-back learning	Assignment
d2.	Group-project	assignment

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a4, d2	<ul style="list-style-type: none"> <li>Definitions</li> <li>Importance of communication in pharmacists with other pharmacists, patients, physicians and other health care professionals</li> <li>History of development of communication skills</li> </ul>	2	4
2	<b>The communication process and Communication media</b>	a2, a4, d2	<ul style="list-style-type: none"> <li>Steps of communication process</li> <li>Types and use of communication media : air, eye to eye, writing, technologic media: videos, social networks</li> </ul>	3	8
3	<b>Effective communication</b>		<ul style="list-style-type: none"> <li>Difference between effective and non-effective communication</li> <li>Importance and Conditions for effective communication</li> <li>Techniques of active communication</li> <li>Active-listening skills</li> <li>Thoughts presentation</li> <li>Questions skills</li> <li>Barriers of communication</li> </ul>	2	4
	<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> </ul>			1	2
	<b>Effective communication</b>		<ul style="list-style-type: none"> <li>Active-listening skills</li> <li>Thoughts presentation</li> <li>Questions skills</li> <li>Barriers of communication</li> </ul>	2	4
4	<b>Non-verbal communication (Body language)</b>	a3, a4, b1, b2, b3	<ul style="list-style-type: none"> <li>Facial signs</li> <li>Hands</li> <li>Distance</li> <li>Interpretation of body language signs</li> </ul>	4	8

Course Review	a3, a4, b1, b2, b3	Review of the course topics by discussion session.	1	2
FINAL - EXAM			1	2
TOTAL			16	32
Number of Weeks /and Units Per Semester			16 weeks	4 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search-based report on one communication media	c2, d2	4	6
2	<b>Group</b> : each group of students will be assigned to do a search-based report on one effective communication techniques	c2, d1	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b1, b2, b3, d1, d2, d2
2	Assignments (1 + 2)	4, 14	10	10	c2, d1, d2
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, b1, b2, b3, d1, d2, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, b1, b2, b3, d1, d2, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

- 1- Tara Dixon, Communication skills, Northumbria university
- 2- Adler, R. B. & Elmhurst, J. M. (1999) Communicating at Work: Principles and Practices for Business and the Professions, McGraw Hill Singapore

### 2- Essential References.

- 3- Tindall, W.N., 2003 Pharmaceutical care ; Insights from community pharmacists, pharmaceutical press

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

IX.Course Policies:	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of COMMUNICATION SKILLS

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

III. Course Description:
The course focuses on study of skills necessary for better communication with patients , health care members and community .

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>3. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
12.	A2	a1. Define communication and communication media.
13.		a2. Determine the main types of communication media
14.	A3	a3. Discuss the techniques for effective communication
15.	A4	a4. Recognize his/her role as pharmacist in effectively communicating with patients and health care team
16.	B1	b1. Interpret signs of non-verbal communication.
17.	B2	b2. Compare between various techniques of effective communication
18.	B3	b3. Predict the person status from his/her body language.
19.	C4	c1 .Properly search for information related to communication techniques using books and suitable media technologies.
20.		c2. Report his/her work efficiently.
21.	D1	d1. Share successfully in team-work.
22.	D5	d2. Demonstrate self-learning and time management .

<b>4. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture	written exam , Practical assessment (Lab accomplishments, Lab. Reporting , practical exam)
a4	lectures	written exam , assignment
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	lecture	Written exam, quiz
b2	Lecture	written exam , quiz
b3	Lecture	written exam
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Feed-back learning ,Group-project.	Written- exam , assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Group-project , feed-back learning	Assignment
d2.	Group-project	assignment

## V. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a4, d2	<ul style="list-style-type: none"> <li>Definitions</li> <li>Importance of communication in pharmacists with other pharmacists, patients, physicians and other health care professionals</li> <li>History of development of communication skills</li> </ul>	2	4
2	<b>The communication process and Communication media</b>	a2, a4, d2	<ul style="list-style-type: none"> <li>Steps of communication process</li> <li>Types and use of communication media : air, eye to eye, writing, technologic media: videos, social networks</li> </ul>	3	8
3	<b>Effective communication</b>	a3, a4, b1, b2, b3	<ul style="list-style-type: none"> <li>Difference between effective and non-effective communication</li> <li>Importance and Conditions for effective communication</li> <li>Techniques of active communication</li> <li>Active-listening skills</li> <li>Thoughts presentation</li> <li>Questions skills</li> <li>Barriers of communication</li> </ul>	2	4
	<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> </ul>			1	2
3	<b>Effective communication</b>	a3, a4, b1, b2, b3	<ul style="list-style-type: none"> <li>Active-listening skills</li> <li>Thoughts presentation</li> <li>Questions skills</li> <li>Barriers of communication</li> </ul>	2	4
4	<b>Non-verbal communication (Body language)</b>	a3, a4, b1, b2, b3	<ul style="list-style-type: none"> <li>Facial signs</li> <li>Hands</li> <li>Distance</li> <li>Interpretation of body language signs</li> </ul>	4	8

Course Review	a3, a4, b1, b2, b3	Review of the course topics by discussion session.	1	2
FINAL - EXAM			1	2
TOTAL			16	32
Number of Weeks /and Units Per Semester			16 weeks	4 Units

## VI. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VII. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search-based report on one communication media	c2, d2	4	6
2	<b>Group</b> : each group of students will be assigned to do a search-based report on one effective communication techniques	c2, d1	14	4

### VIII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b1, b2, b3, d1, d2
2	Assignments (1 + 2)	4, 14	10	10	c2, d1, d2
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, b1, b2, b3, d1, d2,
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, b1, b2, b3, d1, d2
TOTAL			100	100 %	100

### IX. Learning Resources:

#### 1- Required Textbook(s) ( maximum two ).

- 4- Tara Dixon, Communication skills, Northumria university
- 5- Adler, R. B. & Elmhurst, J. M. (1999) Communicating at Work: Principles and Practices for Business and the Professions, McGraw Hill Singapore

#### 2- Essential References.

- 6- Tindall, W.N., 2003 Pharmaceutical care ; Insights from community pharmacists, pharmaceutical press

#### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



<b>X. Course Policies:</b>	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PHYSICS

I.	II. Course Identification and General Information:					
1.	Course Title:	Physics				
2.	Course Code & Number:	MSC 04				
3.	Credit hours:	C.H			TOTAL	
		Theoretical				P.
		L.	Tut.	S.		
		1	1	-		1
4.	Study level/ semester at which this course is offered:	( FIRST ) Year – ( 2 <sup>ND</sup> ) semester				
5.	Pre –requisite (if any):	None				
6.	Co –requisite (if any):	None				
7.	Program (s) in which the course is offered:	All BC programs offered by the university				
8.	Language of teaching the course:	ENGLISH				
9.	Location of teaching the course:	IN THE UNIVERSITY				
10.	Prepared By:					
11.	Date of Approval	<b>10/2016</b>				

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

This course deals with the study of physical parameters that are basics in various field of sciences including pharmacy.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Determine the significance and its significant applications in modern sciences in particular medical sciences.
2.		a2. Define basic physical parameters including those related to kinematics of objects, work, energy, pressure, electricity, light and sound
3.	A3	a3. Discuss the concepts and principles of basics physical phenomena related to movement, forces, electricity and light .
4.	B1	b1. Interpret physical phenomena presented in the topics such as electromagnetic fields, light-refractions
5.	B2	b2. Solve physical problems related to the course topics.
6.		b3. Compare between related physical parameters such as energy , force and power, and between light refraction and light scattering.
7.	B3	b4. Relate basic physical parameters including those related to kinematics of objects, work, energy, pressure, electricity, light and sound to their affecting factors and governing laws.
8.		
9.	B4	b5. Assess the influence of changing of a physical parameter on the changing the physical phenomena
10.	C1	c1. Handle efficiently the tools and chemicals used in physics Lab.
11.		c2. Operate successfully the instruments and chemicals used in physics Lab.
12.		c3. Apply physical laws to solve physical problems.
13.	C2	c4. Perform effectively the experiments he/she is assigned to do in physics Lab and report his/her work correctly.
14.	C3	c5. Take the required safety criteria during performing experiments in physics lab.
15.	D1	d1. Share successfully in team-work.
16.	D3	d2. Communicate effectively with his/her colleagues during performing experiments in physics lab.
17.	D4	d3. behave in discipline during performing experiments in physics lab.
18.	D5	d4. Demonstrate time management during performing experiments in physics lab.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture, Lecture-discussion	written exam
a3	Lecture, Lecture-discussion,, feed-back learning, Group-project.	written exam , assignment

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture, Lab practice	Written exam, practical assessment (lab. accomplishment, practical exam)
b2, b3	Lecture, Lecture-discussion , feed-back learning	written exam , quizzes, assignment
b4	Lecture , Laboratory practice	written exam , practical assessment ( Practical exam)

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
c4	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
c5	Lab. Practice	Practical assessment (Lab activity + practical exam )

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Lab. Practice ,Group-project , , feed-back learning	Practical assessment (Lab Attitude)
d2	Lab. Practice	Practical assessment (Lab Attitude)
d3	Lab. Practice	Practical assessment (Lab Attitude)
d4	Lab. Practice	Practical assessment (Lab Attitude)

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to physics</b>	a1	<ul style="list-style-type: none"> <li>Definition, brief history; relation &amp; applications of physics to modern sciences especially medical sciences</li> </ul>	1	2
2	<b>Kinematics and Newtonian`s laws</b>	a1, a2,a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>definition, parameters, Newtonian`s law of motion, factors affecting including force, gravity, mass, etc.</li> <li>Applications in medical/pharmaceutical sciences.</li> <li>Exercise Problems</li> </ul>	2	4
3	<b>Work and Energy</b>	a1, a2,a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>Definitions</li> <li>differences between energy, work and Power&amp;Laws governing</li> <li>Forms and sources of energy (electric, optical, chemical, thermal, etc.)</li> <li>Applications in medical/pharmaceutical sciences.</li> </ul>	3	8
<b>MID-TERM EXAM</b>				1	2
4	<b>Pressure</b>	a1, a2,a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>Definitions, types</li> <li>Applications in medical/pharmaceutical sciences.</li> <li>Exercise Problems</li> </ul>	1	
5	<b>Electricity</b>	a1, a2,a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>definition, brief history</li> <li>electromagnetic field electrical resistance, potential and current</li> <li>generation techniques</li> <li>Applications in medical/pharmaceutical sciences.</li> <li>Exercise Problems</li> </ul>	3	6
6	<b>Optical physics</b>	a1, a2,a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>photons, light waves, wave length, wave number, frequency.</li> <li>Light spectrum (visible, UV, IR, ..,etc.), light absorbance, light refraction, light scattering</li> </ul>	2	4

			<ul style="list-style-type: none"> <li>• Applications in medical/pharmaceutical sciences.</li> <li>• Exercise Problems</li> </ul>		
7	<b>Sonic (sound) physics</b>	a1, a2,a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>• Sonic waves</li> <li>• ultrasonic waves</li> <li>• Echo</li> <li>• Applications in medical/pharmaceutical sciences.</li> <li>• Exercise Problems</li> </ul>	1	2
	<b>Course Review</b>	a1, a2,a3, b1, b2, b3, b4	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CIOs
1.	Introduction to Physics lab: safety, tools, instruments, scope of experiments and reporting assignments.	1	2	c1, c2, c3, c4, c5, d1, d2, d3, d4
2.	Determination of gravity acceleration	1	2	c1, c2, c3, c4, c5, d1, d2, d3, d4
3.	Determination of different forms of Forces	2	2	c1, c2, c3, c4, c5, d1, d2, d3, d4
4.	Determination of Energy	2	2	c1, c2, c3, c4, c5, d1, d2, d3, d4
5.	Determination of Pressure	1	2	c1, c2, c3, c4, c5, d1, d2, d3, d4
6.	measuring of electric current and voltage with different electricity sources.	2	2	c1, c2, c3, c4, c5, d1, d2, d3, d4
7.	Light spectrum ( Prism )	1	2	c1, c2, c3, c4, c5, d1, d2, d3, d4
8.	Review	1	2	c1, c2, c3, c4, c5, d1, d2, d3, d4
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**lecture - Discussion**: a short lecture/ address followed by discussion

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills



VI. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve physical problems related to course topics.	b2	4-13	3
2	<b>Group :</b> each group of students will be assigned to do a search-based report on one of the physical phenomena in the course topics.	a3	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment %	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b1, b2, b3, b4
2	Assignments (1 + 2)	4-13, 14	5	5	a4, a5, a6, a7, a8, a9
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b2
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, b1, b2, b3, b4
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b1, b2, b3, b4
TOTAL			60	60	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment%	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	c1, c2, c3, c4, c5, d1, d2, d3, d4
2	Lab. Attitude	weekly	2.5	2.5	d1, d2, d3, d4
3	Lab. Accomplishments	weekly	5	5	c1, c2, c3, c4, c5
4	Lab. Reporting	weekly	2.5	2.5	c4
5	Exam of practice theory (written exam or oral exam)	14	5	5	c1, c2, c3, c4, c5, d1, d2, d3, d4
6	Practical exam (practical)	14	20	20	c1, c2, c3, c4,
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Christman. fundamentals of physics

### 2- Essential References.

1. Parkash. An introduction to medical biophysics
2. Cameron, John R. and James G. Skofronick; Medical Physics. A Wiley-Interscience publication.

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

### IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of PHYSICS

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
This course deals with the study of physical parameters that are basics in various field of sciences including pharmacy.

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A2	a1. Determine the significance and its significant applications in modern sciences in particular medical sciences.
2.		a2. Define basic physical parameters including those related to kinematics of objects, work, energy, pressure, electricity, light and sound
3.	A3	a3. Discuss the concepts and principles of basics physical phenomena related to movement, forces, electricity and light .
4.	B1	b1. Interpret physical phenomena presented in the topics such as electromagnetic fields, light-refractions
5.	B2	b2. Solve physical problems related to the course topics.
6.		b3. Compare between related physical parameters such as energy , force and power, and between light refraction and light scattering.
7.	B3	b4. Relate basic physical parameters including those related to kinematics of objects, work, energy, pressure, electricity, light and sound to their affecting factors and governing laws.
8.		
9.	B4	b5. Assess the influence of changing of a physical parameter on the changing the physical phenomena
10.	C1	c1. Handle efficiently the tools and chemicals used in physics Lab.
11.		c2. Operate successfully the instruments and chemicals used in physics Lab.
12.		c3. Apply physical laws to solve physical problems.
13.	C2	c4. Perform effectively the experiments he/she is assigned to do in physics Lab and report his/her work correctly.
14.	C3	c5. Take the required safety criteria during performing experiments in physics lab.
15.	D1	d1. Share successfully in team-work.
16.	D3	d2. Communicate effectively with his/her colleagues during performing experiments in physics lab.
17.	D4	d3. behave in discipline during performing experiments in physics lab.
18.	D5	d4. Demonstrate time management during performing experiments in physics lab.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture, Lecture-discussion	written exam
a3	Lecture, Lecture-discussion,, feed-back learning, Group-project.	written exam , assignment

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture, Lab practice	Written exam, practical assessment (lab. accomplishment, practical exam)
b2, b3	Lecture, Lecture-discussion , feed-back learning	written exam , quizzes, assignment
b4	Lecture , Laboratory practice	written exam , practical assessment ( Practical exam)

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
c4	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
c5	Lab. Practice	Practical assessment (Lab activity + practical exam )

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Lab. Practice ,Group-project , , feed-back learning	Practical assessment (Lab Attitude)
d2	Lab. Practice	Practical assessment (Lab Attitude)
d3	Lab. Practice	Practical assessment (Lab Attitude)
d4	Lab. Practice	Practical assessment (Lab Attitude)

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to physics</b>	a1	<ul style="list-style-type: none"> <li>Definition, brief history; relation &amp; applications of physics to modern sciences especially medical sciences</li> </ul>	1	2
2	<b>Kinematics and Newtonian`s laws</b>	a1, a2,a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>definition, parameters, Newtonian`s law of motion, factors affecting including force, gravity, mass, etc.</li> <li>Applications in medical/pharmaceutical sciences.</li> <li>Exercise Problems</li> </ul>	2	4
3	<b>Work and Energy</b>	a1, a2,a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>Definitions</li> <li>differences between energy, work and Power&amp; Laws governing</li> <li>Forms and sources of energy (electric, optical, chemical, thermal, etc.)</li> <li>Applications in medical/pharmaceutical sciences.</li> </ul>	3	8
<b>MID-TERM EXAM</b>				1	2
4	<b>Pressure</b>	a1, a2,a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>Definitions, types</li> <li>Applications in medical/pharmaceutical sciences.</li> <li>Exercise Problems</li> </ul>	1	
5	<b>Electricity</b>	a1, a2,a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>definition, brief history</li> <li>electromagnetic field electrical resistance, potential and current</li> <li>generation techniques</li> <li>Applications in medical/pharmaceutical sciences.</li> <li>Exercise Problems</li> </ul>	3	6
6	<b>Optical physics</b>	a1, a2,a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>photons, light waves, wave length, wave number, frequency.</li> <li>Light spectrum (visible, UV, IR, ...,etc.), light absorbance, light refraction, light</li> </ul>	2	



			scattering <ul style="list-style-type: none"> <li>• Applications in medical/pharmaceutical sciences.</li> <li>• Exercise Problems</li> </ul>		4
7	<b>Sonic (sound) physics</b>	a1, a2,a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>• Sonic waves</li> <li>• ultrasonic waves</li> <li>• Echo</li> <li>• Applications in medical/pharmaceutical sciences.</li> <li>• Exercise Problems</li> </ul>	1	2
	<b>Course Review</b>	a1, a2,a3, b1, b2, b3, b4	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CLOs
9.	Introduction to Physics lab: safety, tools, instruments, scope of experiments and reporting assignments.	1	2	c1, c2, c3, c4, c5, d1, d2, d3, d4
10.	Determination of gravity acceleration	1	2	c1, c2, c3, c4, c5, d1, d2, d3, d4
11.	Determination of different forms of Forces	2	2	c1, c2, c3, c4, c5, d1, d2, d3, d4
12.	Determination of Energy	2	2	c1, c2, c3, c4, c5, d1, d2, d3, d4
13.	Determination of Pressure	1	2	c1, c2, c3, c4, c5, d1, d2, d3, d4
14.	measuring of electric current and voltage with different electricity sources.	2	2	c1, c2, c3, c4, c5, d1, d2, d3, d4
15.	Light spectrum ( Prism )	1	2	c1, c2, c3, c4, c5, d1, d2, d3, d4
16.	Review	1	2	c1, c2, c3, c4, c5, d1, d2, d3, d4
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**lecture - Discussion**: a short lecture/ address followed by discussion

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

VI. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve physical problems related to course topics.	b2	4-13	3
2	<b>Group :</b> each group of students will be assigned to do a search-based report on one of the physical phenomena in the course topics.	a3	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment %	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b1, b2, b3, b4
2	Assignments (1 + 2)	4-13, 14	5	5	a4, a5, a6, a7, a8, a9
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b2
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, b1, b2, b3, b4
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b1, b2, b3, b4
TOTAL			60	60	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment%	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	c1, c2, c3, c4, c5, d1, d2, d3, d4
2	Lab. Attitude	weekly	2.5	2.5	d1, d2, d3, d4
3	Lab. Accomplishments	weekly	2.5	2.5	c1, c2, c3, c4, c5
4	Lab. Reporting	weekly	5	5	c4
5	Exam of practice theory (written exam or oral exam)	14	5	5	c1, c2, c3, c4, c5, d1, d2, d3, d4
6	Practical exam (practical)	14	20	20	c1, c2, c3, c4,
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Christman. fundamentals of physics

### 2- Essential References.

3. Parkash. An introduction to medical biophysics

4. Cameron, John R. and James G. Skofronick; Medical Physics. A Wiley-Interscience publication.

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

### IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification " ENGLISH FOR MEDICAL PURPOSES"

I. Course Identification and General Information:						
1	Course Title:	English for medical purposes				
2	Course Code &Number:	MSC 05				
3	Credit hours: 4	C.H				TOTAL
		Th.	Tutorial	Pr	Tr.	
		2	2	-	4	
4	Study level/ semester at which this course is offered:	First year/Second semester				
5	Pre –requisite:					
6	Co –requisite :	-				
7	Program (s) in which the course is offered:	Community health				
8	Language of teaching the course:	English				
9	Location of teaching the course:	College of medical Science				
10	Prepared By:					
11	Date of Approval	2016				

### II. Course Description:

This course is designed to help the student acquire a good command and comprehension of the Medical English terminology through individual, papers and conferences. Students will practice their skills in verbal and written English during clinical and classroom experience.

### III. Intended learning outcomes (ILOs) of the course:

1. Identifies basic structures and components of medical terms and names of health problems and how to deal with long Latin of Greek terms and their meanings.
2. Divides the English articles into paragraphs and ideas and memorize and recall information from English articles.
3. Writes properly an essay in English

**(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
A3. Identifies basic structures and components of medical terms and names of health problems and how to deal with long Latin of Greek terms and their meanings.	Lecture Discussion Demonstrate use of dictionary grammar Class-room Conversation Exercise on use of terminology	Short Answers Essay type.

**(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
B1. Divides the English articles into paragraphs and ideas and memorize and recall information from English articles.	Lecture Discussion Exercise on articles	Short Answers Essay type.

**(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
C4. Writes properly an essay in English.	Lecture Discussion Demonstrate use of dictionary grammar Class-room Exercise on Writes properly an essay in English	Short Answers Essay type.

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	No. of Weeks	Contact hours	Learning Outcomes
1	Medical terminology	<ul style="list-style-type: none"> <li>▪ Origin of medical terms</li> <li>▪ Parts of a medical term: prefix, suffix, root</li> <li>▪ Prefixes related adjectives e.g. numeric (e.g.mono) , size" large and small" (e.g. micro, macro) , dimension "short (e.g. brachy) , speed" slow, fast (e.g. brady, tachy), location (intra, exter, per, ante, post) increased and decreased (e.g. hypo, hyper , mal, olig, a, an), different (e.g. dis, pseud, meta,) , colors (e.g. leuco, erytho)</li> <li>▪ Suffixes related to science (e.g. -logy, -logist), tests (-scope, -scopy, -----</li> <li>▪ -graph, -graphy, , measurement (e.g. -meter), case (-ia, -iasis, -osis,), diseases (e.g.- pathy, -oma, -neoplsm), operations( e.g. -ectomy)</li> <li>▪ Roots related to body cells (e.g. cyte, cyto) tissues(hist) , organs (vaso, card), chemical names (glyc, hydr, chlor, proteo), <b>sciences</b> (patho, physio, bio)</li> <li>▪ Multi-roots terms e.g.</li> </ul>	6	24	A3



		<p>hyperglycemia</p> <ul style="list-style-type: none"> <li>▪ Terms without suffix e.g. erythrocytes</li> <li>▪ Terms without prefix e.g. cardiology</li> </ul>			
2	Midterm exam		1	2	A3
3	Articles understanding	<ul style="list-style-type: none"> <li>▪ <b>Basic skills</b></li> <li>- Comprehensive reading</li> <li>- Overall topic of the article</li> <li>- Paragraphing</li> <li>- Memorizing</li> <li>- Recalling</li> <li>- Answering questions</li> <li>- Making questions</li> <li>▪ Experimentation of basic skills on a number of Medical articles</li> <li>- History of Medicine (1- in Muslims civilization, Greek civilization)</li> <li>- Human anatomy (skeletal system)</li> <li>- Disease (1.symptoms); ( 2-infectious diseases) ; (3-prevention of disease), ( 4-disease treatment),</li> <li>- current chronic Diseases (1.Hypertension); ( 2-Diabetes) ; (3-Depression), ( 4- Cancer),</li> </ul>	4	16	B1
4	Essay	<ul style="list-style-type: none"> <li>▪ Basic skills</li> <li>- Making a correct sentence.</li> <li>- Flow and compatibility of ideas.</li> <li>- Topics (medical and nursing)</li> </ul>	3	12	C4
5	Final exam		1	3	A3,B1,C4

<b>Number of Weeks /and Units Per Semester</b>	<b>15</b>	<b>57</b>	
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<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
	<b>Not applicable</b>	-	-	-
<b>Number of Weeks /and Units Per Semester</b>				

<b>V. Teaching strategies of the course:</b>	
1.	Lecture Discussion
2.	Demonstrate use of dictionary grammar
3.	Exercises

<b>VI. Assignments:</b>				
No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Community health terminology	A3,B1,C4	4-10	5

<b>VII. Schedule of Assessment Tasks for Students During the Semester: Theoretical part</b>					
No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and activities	15th week	5	5%	A3,B1,C4
2	Student assignments	5th and 12th week	5	5%	A3,B1,C4
3	Mid-term exam	7th or 8th week	20	20%	A3
4	Final-exam	16th-17th week	70	70 %	A3,B1,C4
<b>Total Theory Weight</b>			<b>100</b>	<b>100%</b>	

## VIII. Learning Resources:

### 1- Required Textbook(s)

1. Selva Rose. (1997), Career English for Nurses. Cheiu;ai: OientLongrnanLtd.
2. Quirk, Randolph and Jreenbaum Sidney(1987). A University Grammar of English, Hong Kong: Longman group (FE) Ltd.

### 2- Essential References.

1. Thomson A. J. and Maitüiet A. V. (1987). A licticl English Grammar, Delhi: Oxford University Press.
2. Gimson A. E. (1986). An Introduction to pronunciation of English. Hong kong: Wing King Tong Ca. Ltd.
3. O' Connor J. D, (1986). Better English h'onuwiation. Cambridge:University Press.

### 3- Electronic Materials and Web Sites etc.

1. Http: // www.google. Com
2. Http:// www.yahoo.com

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp;Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.

## Template for Course Plan (Syllabus) of " ENGLISH FOR MEDICAL PURPOSES"

I. Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		<b>Office Hours</b>					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail		x					

II. Course Identification and General Information:						
1.	Course Title:	<b>English for medical purposes</b>				
2.	Course Number & Code:	<b>MSC05</b>				
3.	Credit hours: 4	<b>C.H</b>				<b>Total</b>
		<b>Th.</b>	<b>Seminar</b>	<b>Pr.</b>	<b>F. Tr.</b>	
		4	-	-	-	
4.	Study level/year at which this course is offered:	First year/Second semester				
5.	Pre –requisite:	-				
6.	Co –requisite :	-				
7.	Program (s) in which the course is offered	Community health				
8.	Language of teaching the course:	English				
9.	System of Study:	Semester system				
10.	Mode of delivery:	Full time				
11.	Location of teaching the course:	College of medical Science				

III. Course Description:
<p>This course is designed to help the student acquire a good command and comprehension of the Medical English terminology through individual, papers and conferences. Students will practice their skills in verbal and written English during clinical and classroom experience.</p>

#### IV. Intended learning outcomes (ILOs) of the course:

1. Identifies basic structures and components of medical terms and names of health problems and how to deal with long Latin of Greek terms and their meanings.
2. Divides the English articles into paragraphs and ideas and memorize and recall information from English articles.
3. Writes properly an essay in English

#### V. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

##### A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	Medical terminology	1-6	8
2	Midterm exam	7	2
3	Articles understanding	8-11	12
4	Essay	12-14	8
5	Final exam	15	3
Number of Weeks /and Units Per Semester		15	57

##### B– Practical Aspect:

Order	Topics List	Week Due	Contact Hours
	Not applicable	-	-
Number of Weeks /and Units Per Semester			

#### VI. Teaching strategies of the course:

1. Lecture Discussion
2. Demonstrate use of dictionary grammar
3. Exercises

## VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Community health terminology	A3,B1,C4	4-10	5

## VIII. Schedule of Assessment Tasks for Students During the Semester Theoretical part

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and activities	15th week	5	5%	A3,B1,C4
2	Student assignments	5th and 12th week	5	5%	A3,B1,C4
3	Mid-term exam	7th or 8th week	20	20%	A3
4	Final-exam	16th-17th week	70	70 %	A3,B1,C4
<b>Total Theory Weight</b>			<b>100</b>	<b>100%</b>	

## IX. Learning Resources:

1- Required Textbook(s)	
	1. Selva Rose. (1997), Career English for Nurses. Cheiu;ai: OientLongrnanLtd. 2. Quirk, Randolph and JreenbaumSidney(1987). A University Grammar of English, Hong Kong: Longman group (FE) Ltd.
2- Essential References.	
	1. Thomson A. J. and Maitüiet A. V. (1987). A licticl English Grammar, Delhi: Oxford University Press. 2. Harvey Marcovich (2005). Black Medical dictionary, 2005, A & C Black Publishers Limited 3. O' Connor J. D, (1986). Better English h'onuwiation. Cambridge: University Press.

### 3- Electronic Materials and Web Sites etc.

1. [Http:// www.google. Com](http://www.google.com)
2. [Http:// www.yahoo.com](http://www.yahoo.com)

### X. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.

## Course Specification ANATOMY & HISTOLOGY

I. Course Identification and General Information:					
1	Course Title:	Anatomy and Histology			
2	Course Code & Number:	MSC06			
3	Credit hours: 3	C.H			TOTAL
		Th.	Seminar	Pr	
		2	-	1	
4	Study level/ semester at which this course is offered:	First year/Second semester			
5	Pre –requisite:	-			
6	Co –requisite :	-			
7	Program (s) in which the course is offered:	Community health			
8	Language of teaching the course:	English			
9	Location of teaching the course:	College of medical Science			
10	Prepared By:				
11	Date of Approval	2015			

### II. Course Description:

The course focuses on the components of the main anatomical structure and functioning of the body and its systems and organs. The course includes the structure and function of the human body & organs tissues, their different types, location, distribution and function in human body and of the different organ system and their prospective roles and function in the organization of the body. Gross anatomy is treated in its broadest aspects and includes the human skill and the different system: Skeletal, muscular, nervous, sensory and circulatory and lymphatic.



### III. Intended learning outcomes (ILOs) of the course:

1. Develop a clear understanding of the basic concepts of anatomy, organization of human body and structure of cell, tissues, membranes and glands.
2. Describe the structure & function of bones, joints, muscles, nervous system, sensory organs, circulatory, lymphatic system, respiratory system, digestive, excretory (Urinary), endocrine, and reproductive system including breast.
3. Demonstrates the topography of human body.

#### (A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
A2. Describe the structure & function of bones, joints, muscles, nervous system, sensory organs, circulatory, lymphatic system, respiratory system, digestive, excretory (Urinary), endocrine, and reproductive system including breast.	Lecture discussion Explain using charts, skeleton, loose bones, and joints Demonstrate muscular movements	Short answer questions Objective type

#### (B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
B1. Develop a clear understanding of the basic concepts of anatomy, organization of human body and structure of cell, tissues, membranes and glands.	Lecture discussion Explain using charts, microscopic slides, Skeleton & torso Demonstrate cells, types of tissues membranes and glands	Short answer questions Objective type

#### (C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
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C1.Demonstrates the topography of human body.	Lecture discussion Case discussions / Seminar Record book	Assess performance with rating scale Assess each skill with checklist Evaluation of case study! presentation Practical record. practical exam
<b>(D) Alignment Course Intended Learning Outcomes of General and Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>Not applicable</b>	-	-

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	No. of Weeks	Contact hours	Learning Outcomes
1	Introduction to Anatomical terms organization of the human body	<ul style="list-style-type: none"> <li>▪ Human Cell structure</li> <li>▪ Tissues -Definition, Types, characteristics, classification, location, functions and formation</li> <li>▪ General Histology, study of the basic tissues of the body</li> <li>▪ Microscope, Cell, Epithelium, Connective Tissue, Cartilage, Bone, Muscular tissue, Nerve, Tissue – TS &amp; LS, Circulatory system – large sized artery, medium sized artery, large sized vein, lymphoid tissue, Skin and its appendages.</li> </ul>	2	4	B1
2	The Skeletal System	<ul style="list-style-type: none"> <li>▪ Bones- types, structure, Axial &amp; Appendicular Skeleton,</li> <li>▪ Bone formation and growth</li> <li>▪ Description of bones</li> <li>▪ Joints - classification and structure</li> </ul>	1	2	A2
3	The Muscular System	<ul style="list-style-type: none"> <li>▪ Types and structure of muscles</li> <li>▪ Muscle groups Alterations in disease Applications and implications in nursing</li> </ul>	1	2	A2
4	Midterm exam		1	2	A2,B1

5	The Nervous System	<ul style="list-style-type: none"> <li>▪ Structure of neurologia&amp; neurons</li> <li>▪ Somatic Nervous system               <ul style="list-style-type: none"> <li>- Structure of brain, spinal cord, cranial nerves, spinal nerves, peripheral nerves</li> </ul> </li> <li>▪ Autonomic Nervous System - sympathetic, parasympathetic               <ul style="list-style-type: none"> <li>- Structure, location</li> </ul> </li> </ul>	1	2	A2
6	The Sensory Organs	<ul style="list-style-type: none"> <li>▪ Structure of skin, eye, ear, nose, tongue, (Auditory and olfactory apparatus)</li> </ul>	1	2	A2
7	Circulatory and lymphatic system	<ul style="list-style-type: none"> <li>▪ The Circulatory System               <ul style="list-style-type: none"> <li>- Blood-Microscopic: structure</li> <li>- Structure of Heart</li> <li>- Structure of blood vessels-Arterial &amp; Venous System,</li> <li>- Circulation: systemic, pulmonary, coronary</li> </ul> </li> <li>▪ Lymphatic system:               <ul style="list-style-type: none"> <li>- Lymphatic vessels and lymph</li> <li>- Lymphatic tissues</li> <li>- Thymus gland</li> <li>- Lymph nodes                   <ul style="list-style-type: none"> <li>○ Lymphatic nodules</li> </ul> </li> </ul> </li> </ul>	2	4	A2
8	The Respiratory System	<ul style="list-style-type: none"> <li>▪ Structure of the organs of respiration</li> <li>▪ Muscles of respiration: Intercostal and Diaphragm</li> </ul>	1	2	A2,B1
9	The Digestive System	<ul style="list-style-type: none"> <li>▪ Structure of Alimentary tract and accessory organs of digestion</li> </ul>	2	4	A2,B1

10	The Excretory System (Urinary)	<ul style="list-style-type: none"> <li>▪ Structure of organs of urinary</li> <li>▪ System: Kidney, ureters, urinary bladder, urethra, structure of skin</li> </ul>	1	2	A2,B1
11	The Endocrine System	<ul style="list-style-type: none"> <li>▪ Structure of Pituitary, Pancreas, thyroid, Parathyroid, thymus and adrenal glands</li> </ul>	1	2	A2,B1
12	The Reproductive system including breast	<ul style="list-style-type: none"> <li>▪ Structure of female reproductive organs</li> <li>▪ Structure of male reproductive organs.</li> <li>▪ Structure of breast</li> </ul>	1	2	A2,B1
13	Final exam		1	2	A2,B1
<b>Number of Weeks /and Units Per Semester</b>			<b>16</b>	<b>32</b>	

### B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Upper extremity including surface Anatomy	4	8	C1
2	Lower extremity including surface Anatomy	4	8	C1
3	Head & Spinal cord and Neck and Brain including surface Anatomy	4	8	C1
4	Thorax including surface anatomy, abdominal muscles joints	3	6	C1
<b>Number of Weeks /and Units Per Semester</b>		<b>15</b>	<b>30</b>	

### V. Teaching strategies of the course:

1. Lecture Discussion
2. Case discussions
3. Seminar
4. Practical session

### VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Draw the heart	A2	4-10	5

### VII. Schedule of Assessment Tasks for Students During the Semester Theoretical part

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and activities	15th week	2	2%	A2,B1
2	Student assignments	5th and 12th week	5	5%	A2
	QUIZ 1 + 2	4 <sup>TH</sup> AND 13 <sup>TH</sup>	3	3%	
3	Mid-term exam	7th or 8th week	10	10%	A2,B1
4	Final-exam	16th-17th week	40	40 %	A2,B1
	<b>Total Theory Weight</b>		<b>60</b>	<b>60%</b>	

Practical part					
Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and Attitude	14 <sup>th</sup> week	5	10%	C1
2	Semester work	1 <sup>st</sup> and 14 <sup>th</sup> week	10	10%	C1
3	Final exam (theory or oral )	15 <sup>th</sup> week	5	50%	C1
4	Final exam (practical)	16 <sup>th</sup> -17 <sup>th</sup> week	20	30%	C1
<b>Total Practical Weight</b>			<b>40</b>	<b>40%</b>	

## VIII. Learning Resources:

### 1- Required Textbook(s)

1. Cohen (2009). Memmler's Structure & Function of Human Body, LWW.
2. Tortora, G.J. (2006). Introduction to the human body. Harper and Row Publisher, New York.

### 2- Essential References.

1. Alexander P. (2008). Human anatomy and physiology. Benjamin/Cummings Pub. California.
2. Waugh(2008). Ross & Wilson Anatomy & Physiology, Elsevier.
3. Tortora (2007). Anatomy & Physiology, Wiley
4. Chaurasia (2005). Human Anatomy, CBS Publishers
5. Standring (2006). Gray's Anatomy, Elsevier

### 3- Electronic Materials and Web Sites etc.

1. Http: // www.google. Com
2. Http:// www.yahoo.com

<b>IX. Course Policies:</b>	
<b>1.</b>	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
<b>2.</b>	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
<b>3.</b>	<b>Exam Attendance/Punctuality:</b> Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
<b>4.</b>	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
<b>5.</b>	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
<b>6.</b>	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.



## Template for Course Plan (Syllabus) of ANATOMY & HISTOLOGY

I. Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	Dr.	Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail		x					

II. Course Identification and General Information:						
1.	Course Title:	Anatomy and Histology				
2.	Course Number & Code:	MSC06				
3.	Credit hours: 3	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2	-	1	-	
4.	Study level/year at which this course is offered:	First year/Second semester				
5.	Pre –requisite:	-				
6.	Co –requisite :	-				
7.	Program (s) in which the course is offered	Community health				
8.	Language of teaching the course:	English				
9.	System of Study:	Semester system				
10.	Mode of delivery:	Full time				
11.	Location of teaching the course:	College of medical Science				

III. Course Description:
<p>The course focuses on the components of the main anatomical structure and functioning of the body and its systems and organs. The course includes the structure and function of the human body &amp; organs tissues, their different types, location, distribution and function in human body and of the different organ system and their prospective roles and function in the organization of the body. Gross anatomy is treated in its broadest aspects and includes the human skill and the different system: Skeletal, muscular, nervous, sensory and circulatory and lymphatic.</p>

#### IV. Intended learning outcomes (ILOs) of the course:

1. Develop a clear understanding of the basic concepts of anatomy, organization of human body and structure of cell, tissues, membranes and glands.
2. Describe the structure & function of bones, joints, muscles, nervous system, sensory organs, circulatory, lymphatic system, respiratory system, digestive, excretory (Urinary), endocrine, and reproductive system including breast.
3. Demonstrates the topography of human body.

#### V. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

##### A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	Introduction to Anatomical terms of the human body	1-2	4
2	The Skeletal System	3	2
3	The Muscular System	4	2
4	Midterm exam	5	2
5	The Nervous System	6	2
6	The Sensory Organs	7	2
7	The Circulatory and lymphatic system	8-9	4
8	The Respiratory System	10	2
9	The Digestive System	11-12	4
10	The Excretory System (Urinary)	13	2
11	The Endocrine System	14	2
12	The Reproductive system including breast	15	2
13	Final exam	16	2
<b>Number of Weeks /and Units Per Semester</b>		<b>16</b>	<b>32</b>

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Upper extremity including surface Anatomy	4	8	C1
2	Lower extremity including surface Anatomy	4	8	C1
3	Head & Spinal cord and Neck and Brain including surface Anatomy	4	8	C1
4	Thorax including surface anatomy, abdominal muscles joints	3	6	C1
<b>Number of Weeks /and Units Per Semester</b>		<b>15</b>	<b>30</b>	

#### VI. Teaching strategies of the course:

1. Lecture Discussion
2. Case discussions
3. Seminar
4. Practical session

#### VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Draw the heart	A2	4-10	5

**VIII. Schedule of Assessment Tasks for Students During the Semester:  
 Theoretical part**

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and activities	15th week	5	5%	A2,B1
2	Student assignments	5th and 12th week	5	5%	A2
3	Mid-term exam	7th or 8th week	10	10%	A2,B1
4	Final-exam	16th-17th week	40	40 %	A2,B1
<b>Total Theory Weight</b>			<b>60</b>	<b>60%</b>	

**Practical part**

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and Attitude	14 <sup>th</sup> week	5	10%	C1
2	Semester work	1 <sup>st</sup> and 14 <sup>th</sup> week	10	10%	C1
3	Final exam (theory or oral )	15 <sup>th</sup> week	5	50%	C1
4	Final exam (practical)	16 <sup>th</sup> -17 <sup>th</sup> week	20	30%	C1
<b>Total Practical Weight</b>			<b>40</b>	<b>40%</b>	

## VIII. Learning Resources:

### 1- Required Textbook(s)

1. Cohen (2009). Memmler's Structure & Function of Human Body, LWW.
2. Tortora, G.J. (2006). Introduction to the human body. Harper and Row Publisher, New York.

### 2- Essential References.

1. Alexander P. (2008). Human anatomy and physiology. Benjamin/Cummings Pub. California.
2. Waugh(2008). Ross & Wilson Anatomy & Physiology, Elsevier.
3. Tortora (2007). Anatomy & Physiology, Wiley
4. Chaurasia (2005). Human Anatomy, CBS Publishers
5. Standring (2006). Gray's Anatomy, Elsevier

### 3- Electronic Materials and Web Sites etc.

1. Http: // www.google. Com
2. Http:// www.yahoo.com

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.

## Course Specification

### MATHEMATICS

I.	II. Course Identification and General Information:					
1.	Course Title:	Mathematics				
2.	Course Code & Number:	PHRE 01				
3.	Credit hours:	C.H			TOTAL	
		Theoretical		P.		Tr.
		L.	Tut.			
		1	1	-		-
4.	Study level/ semester at which this course is offered:	( FIRST ) Year – ( 2 <sup>ND</sup> ) semester				
5.	Pre –requisite (if any):	NONE				
6.	Co –requisite (if any):	NONE				
7.	Program (s) in which the course is offered:	All BC programs offered by the university				
8.	Language of teaching the course:	ENGLISH				
9.	Location of teaching the course:	IN THE UNIVERSITY				
10.	Prepared By:					
11.	Date of Approval	<b>08/2017</b>				

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

III.	Course Description:
	This course provides basic knowledge & skills of solving mathematical processes encountered in pharmacy

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A3	a1. Discuss the basic mathematical principles commonly encountered during his/her pharmacy study and at practicing the profession.
2.	B1	b1. Interpret the linearity and other graphical parameters.
3.	B2	b2. Solve graphically, calculus and matrices mathematical problems.
4.	B3	b3. Extract related equations from graphs.
5.	B4	b4. Use the serial thinking to find the solution of mathematical problems.
6.	C1	c1. Operate and use scientific calculator correctly.
7.	C2	c2. Apply equations and rules to solve mathematical problems
8.	D1	d1. Share successfully in team-work.
9.	D5	d2. Demonstrate time management during solving mathematical problems

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture-discussion,, feed-back learning,	written exam

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	feed-back learning, Group-project.	Written exam
b2	Lecture-discussion , feed-back learning	written exam , quizzes, assignment
b3	Lecture-discussion, feed-back learning	written exam

b4	Lecture-discussion	written exam , quiz
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
c1	Lecture-discussion	Written exam
c2	Feed-back learning	Written exam
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
d1	Lecture-discussion	Assignment
d2	Lecture-discussion	Quiz



IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Graphs and Gradients</b>	a1, b1, b2, b3, b4, c1, c2	<ul style="list-style-type: none"> <li>Rectangular Co-ordinates. Curve fitting using first-degree equation in both variables.</li> <li>Determination of slope and intercept and point of intersection</li> <li>Equation of first degree in both x and y (circle, ellipse, rectangular hyperbola etc.</li> <li>Exponential and logarithmic curves, graphical solution of equation, graphical solution of</li> <li>simultaneous equations</li> <li>Arithmetic progression, geometric progression, permutation-combination, binomial theorem, exponential theorem</li> <li>Application of curve fitting method in expressing degradation of drugs</li> </ul>	6	12
MID-TERM EXAM				1	2
2	<b>Calculus</b>	a1, b2, b4, c1, c2	<ul style="list-style-type: none"> <li>Rate process, rules of differentiation, successive and partial differentiation, differentiation of a function, relation between the derivatives of inverse functions</li> <li>Rules of integration, integration as a summation, area under curve, integration by partial fraction, graphical integration, indefinite and definite integrals.</li> </ul>	3	6
3	<b>Matrices</b>	a1, b2, b4, c1, c2	<ul style="list-style-type: none"> <li>Addition. Subtraction and multiplication of matrices</li> <li>unit matrix, row transformation, determinants, inverse of matrix and solution of equations by matrix</li> </ul>	4	8
<b>Course Review</b>		a1, b2, b3, b4, c1,c2	Review of the course topics by discussion session.	1	2

FINAL - EXAM	1	2
TOTAL	16	32
Number of Weeks /and Units Per Semester	16 weeks	3 Units

## V. Teaching strategies of the course:

**lecture - Discussion:** a short lecture/ address followed by discussion

**Seminars:** these are mainly used with small groups of students (20-30) students in which they find better chances for discussing and participating in the teaching process.

**Feed-back learning:** students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve mathematical problems during Tutorial at the class .	a1, b2, b4, c1, d2	4-13	6
2	<b>Group :</b> each group of students will be assigned to solve mathematical problems during as homework	a1, b2, b4, c1, d1	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, b2, b4, c1,c2, d1, d2
2	Assignments (1 + 2)	4-13, 14	10	10	a1, b2, b4, c1, d1, d2
3	Quiz 1 + Quiz 2	7, 12	5	5	c1, b4
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, b1, b2, b3, b4, c1
5	Final exam of theoretical part ( written exam)	17	60	60	a1, b2, b3, b4, c1,c2
TOTAL			100	100 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Rao. A text book of mathematics

### 2- Essential References.

2. Indra K. Reddy Mansoor a. khan, Essential Math and calculations for pharmacy, CRC Press
3. Shahidulla , Bhattacharjee : A text book on Coordinate Geometry and Vector Analysis

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

### IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of MATHEMATICS

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
This course provides basic knowledge & skills of solving mathematical processes encountered in pharmacy

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A3	a1. Discuss the basic mathematical principles commonly encountered during his/her pharmacy study and at practicing the profession.
2.	B1	b1. Interpret the linearity and other graphical parameters.
3.	B2	b2. Solve graphically, calculus and matrices mathematical problems.
4.	B3	b3. Extract related equations from graphs.
5.	B4	b4. Use the serial thinking to find the solution of mathematical problems.
6.	C1	c1. Operate and use scientific calculator correctly.
7.	C2	c2. Apply equations and rules to solve mathematical problems
8.	D1	d1. Share successfully in team-work.
9.	D5	d2. Demonstrate time management during solving mathematical problems

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture-discussion,, feed-back learning,	written exam

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	feed-back learning, Group-project.	Written exam
b2	Lecture-discussion , feed-back learning	written exam , quizzes, assignment
b3	Lecture-discussion, feed-back learning	written exam

b4	Lecture-discussion	written exam , quiz
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
c1	Lecture-discussion	Written exam
c2	Feed-back learning	Written exam
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
d1	Lecture-discussion	Assignment
d2	Lecture-discussion	Quiz

IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Graphs and Gradients</b>	a1, b1, b2, b3, b4, c1, c2	<ul style="list-style-type: none"> <li>Rectangular Co-ordinates. Curve fitting using first-degree equation in both variables.</li> <li>Determination of slope and intercept and point of intersection</li> <li>Equation of first degree in both x and y (circle, ellipse, rectangular hyperbola etc.</li> <li>Exponential and logarithmic curves, graphical solution of equation, graphical solution of</li> <li>simultaneous equations</li> <li>Arithmetic progression, geometric progression, permutation-combination, binomial theorem, exponential theorem</li> <li>Application of curve fitting method in expressing degradation of drugs</li> </ul>	6	12
MID-TERM EXAM				1	2
2	<b>Calculus</b>	a1, b2, b4, c1, c2	<ul style="list-style-type: none"> <li>Rate process, rules of differentiation, successive and partial differentiation, differentiation of a function, relation between the derivatives of inverse functions</li> <li>Rules of integration, integration as a summation, area under curve, integration by partial fraction, graphical integration, indefinite and definite integrals.</li> </ul>	3	6
3	<b>Matrices</b>	a1, b2, b4, c1, c2	<ul style="list-style-type: none"> <li>Addition. Subtraction and multiplication of matrices</li> <li>unit matrix, row transformation, determinants, inverse of matrix and solution of equations by matrix</li> </ul>	4	8
<b>Course Review</b>		a1, b2, b3, b4, c1,c2	Review of the course topics by discussion session.	1	2



FINAL - EXAM	1	2
TOTAL	16	32
Number of Weeks /and Units Per Semester	16 weeks	3 Units

## V. Teaching strategies of the course:

**lecture - Discussion:** a short lecture/ address followed by discussion

**Seminars:** these are mainly used with small groups of students (20-30) students in which they find better chances for discussing and participating in the teaching process.

**Feed-back learning:** students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve mathematical problems during Tutorial at the class .	a1, b2, b4, c1, d2	4-13	6
2	<b>Group :</b> each group of students will be assigned to solve mathematical problems during as homework	a1, b2, b4, c1, d1	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, b2, b4, c1,c2, d1, d2
2	Assignments (1 + 2)	4-13, 14	10	10	a1, b2, b4, c1, d1, d2
3	Quiz 1 + Quiz 2	7, 12	5	5	c1, b4
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, b1, b2, b3, b4, c1
5	Final exam of theoretical part ( written exam)	17	60	60	a1, b2, b3, b4, c1,c2
TOTAL			100	100 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Rao. A text book of mathematics

### 2- Essential References.

2. Indra K. Reddy Mansoor a. khan, Essential Math and calculations for pharmacy, CRC Press
3. Shahidulla , Bhattacharjee : A text book on Coordinate Geometry and Vector Analysis

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

IX.Course Policies:	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### ORGANIC CHEMISTRY

I.	II. Course Identification and General Information:						
1.	Course Title:	Organic chemistry					
2.	Course Code & Number:	PHRM 01					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		3	-	-	1		-
4.	Study level/ semester at which this course is offered:	( FIRST ) Year – ( 2 <sup>ND</sup> ) semester					
5.	Pre –requisite (if any):	General chemistry					
6.	Co –requisite (if any):	NONE					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10.	Prepared By:						
11.	Date of Approval	10/2016					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### III. Course Description:

The course concerns with study of the chemistry of carbon and essential classes of organic compounds as an introduction to specific medicinal chemistry courses.

### III. Intended learning outcomes of the course: (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No	PILOs	Intended learning outcomes of the course (CILOs)
1.	A2	a1. Explain the significance of organic chemistry in modern sciences and .
2.	A3	a2. Discuss the properties of Carbon atom, models of structural formula, specific properties and mechanisms of reactions of organic compounds.
3.	B1	b1. Interpret the influence of functional group on physical and chemical properties of organic compounds.
4.		b2. Design a plan to synthesize an organic compound from a parent compound using serial thinking .
5.	B2	b3. Classify organic compounds based on functional group.
6.		b4. Differentiate between different types of organic compounds based on their physical properties, structural formula, molecular formula and chemical reactions
7.	B3	b5 . Name organic compounds using IUPAC nomenclature rules.
8.		b6. Relate functional group in organic compounds to the physical and chemical properties of the compounds.
9.		b7. Predict the catalysts required and the outcomes of a reaction between an organic compound and other chemicals.
10.	C1.	c1. Handle efficiently the tools and chemicals used in chemistry lab.
11.		c2. Operate successfully the instruments used in chemistry lab.
12.	C2	c3 . Perform effectively experimentations of chemical reactions including identification and synthesis of organic compounds in chemistry lab using standard procedures and provide report of his work.
13.		c4 . Draw the structure of organic compounds using structural formula.
14.	C3	c6 .Take the required safety criteria during performing experiments in chemistry lab.
15.	D1	d1. Share successfully in team-work during performing experiments in chemistry lab.
16.	D3	d2. Communicate effectively with his/her colleagues during performing experiments in chemistry lab.
17.	D4	d3. Behave in discipline during performing experiments in chemistry lab.
18.	D5	d4. Demonstrate time management during performing experiments in chemistry lab.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, Lecture-discussion	written exam
a2	Lecture, Lecture-discussion	written exam

### (b) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1 , b2	Lectures	Written exam
b3, b4	Lecture, Lecture-discussion , feed-back learning	written exam , assignment, quizzes
b5, b6, b7	Lecture, Lecture-discussion, feed-back learning	written exam, quizzes

### (c) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment (Lab accomplishments, lab. reporting, practical exam )
c3, c4	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
c5	Lab. Practice	Practical assessment (Lab accomplishment + practical exam )

### (d) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Lab. Practice	Practical assessment (Attitude)
d2	Lab. Practice,	Practical assessment (Lab Attitude)
d3	Lab. Practice	Practical assessment (Lab Attitude)
d4	Lab. Practice	Practical assessment (Lab Attitude)

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	Aligned Course Learning Outcomes	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to organic chemistry</b>	a1, a2	<ul style="list-style-type: none"> <li>definition, brief history</li> <li>significance of organic chemistry in modern sciences</li> <li>Carbon chemistry: carbon atomic structure, chemical bonds, atomic Orbitals and electron configuration; <math>sp^3</math>, <math>sp^2</math>, sphybridization</li> <li>Physical state</li> <li>stereochemistry of organic compounds</li> <li>isomerism</li> <li>Resonance</li> <li>dipole moment</li> <li>structural theory</li> <li>Models of Structural formula (all-stick formula, dot formula, dash formula, condensed formula, bond-line formula)</li> </ul>	2	6
2	<b>Functional groups &amp; Classification of organic compounds</b>	b1, b2, b3, b4, b5, b6, c4	<ul style="list-style-type: none"> <li>Definition and types of functional groups</li> <li>classification into categories based on functional groups.</li> <li>Role of functional group in physical &amp; chemical properties of organic compounds.</li> <li>Common names Origin</li> <li>IUPAC Nomenclature priority ( which functional group is more important ?)</li> <li>Differences between aliphatic &amp; aromatic organic compounds</li> </ul>	1	3
3	<b>Hydrocarbons</b>	b1, b2, b3, b4, b5, b6, b7, c4	<p>(1) <b>Aliphatic (Alkanes, Alkenes, Alkynes, cycloalkanes, cycloalkenes):</b> definitions, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, synthesis and reactions (including mechanisms of reactions).</p> <p>(2) <b>Aromatic hydrocarbon</b> (definitions,</p>	1	

			types, general formula, structural models, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, , synthesis and reactions (including mechanisms of reactions).		
4	<b>Haloalkanes</b>	b1, b2, b3, b4, b5, b6, b7, c4	<ul style="list-style-type: none"> <li><b>Aliphatic and aromatic Alkyl halides (Haloalkanes)</b> and organometallic compounds: (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, physical properties, synthesis and reactions (including mechanisms of reactions).</li> </ul>	1	3
<b>MID-TERM EXAM</b>				1	2
5	<b>Aliphatic and aromatic Alcohols , ethers and thioethers</b>	b1, b2, b3, b4, b5, b6, b7, c4	<ul style="list-style-type: none"> <li>(definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, synthesis reactions (including mechanisms of reactions).</li> </ul>	2	
6	<b>Aliphatic and aromatic Amines</b>	b1, b2, b3, b4, b5, b6, b7, c4	<ul style="list-style-type: none"> <li>(definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, synthesis and reactions)</li> </ul>	1	3
7	<b>Aliphatic and aromatic Nitro compounds</b>	b1, b2, b3, b4, b5, b6, b7, c4	<ul style="list-style-type: none"> <li>: (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, physical properties, synthesis and reactions (including mechanisms of reactions).</li> </ul>	1	3
8	<b>Aliphatic and aromatic aldehydes and ketones</b>	b1, b2, b3, b4, b5, b6, b7, c4	<ul style="list-style-type: none"> <li>: (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, physical properties, synthesis and reactions)</li> </ul>	2	6
9	<b>Aliphatic and aromatic carboxylic acids</b>	b1, b2, b3, b4, b5, b6, b7, c4	<ul style="list-style-type: none"> <li>: (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, physical properties, synthesis and reactions (including</li> </ul>	1	3



			mechanisms of reactions).		
10	<b>Aliphatic and aromatic derivatives of carboxylic acids</b>	b1, b2, b3, b4, b5, b6, b7, c4	<b>Esters, amides, acyl halides, acid anhydrides:</b> <ul style="list-style-type: none"> <li>• : (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, physical properties, synthesis and reactions (including mechanisms of reactions).</li> </ul>	1	3
11	<b>Serial synthesis</b>	b2	Synthesis of an organic compound starting from simple parent organic compound.	1	3
<b>Course Review and discussion session</b>				1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				17	49
<b>Number of Weeks /and Units Per Semester</b>				17 weeks	11 units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Learning Outcomes</b>
<b>1.</b>	Physical properties & Chemical identification of compounds belonging to the following aliphatic and aromatic organic groups:			
<b>2.</b>	Hydrocarbons / Haloalkanes.	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>3.</b>	Alcohols	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>4.</b>	Ethers	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>5.</b>	amines	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>6.</b>	Aldehydes	<b>1</b>		c1, c2, c3, c4, d1, d2, d3, d4
<b>7.</b>	Ketones	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>8.</b>	Carboxylic acids	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>9.</b>	Esters	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>10.</b>	Acyl anhydride / Amides	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>11.</b>	Scheme of identification of organic compounds	<b>2</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	a2, c1, c2, c3, c4
<b>Total</b>		<b>13</b>	<b>26 equivalent to 13 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.                  The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>lecture - Discussion</b>: a short lecture/ address followed by discussion</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	<p><b>Individual</b>: every student is assigned to solve problems at home. The problems are provided by the teacher at the end of each unit. Problems are related to completion of a chemical reaction, nomenclature, draw structures, mechanisms of reactions and others. The student should deliver his/her work every second week in a specific homework booklet. The teacher may ask the student, either personally, or at the class to make sure that the student work belongs to his/her lonely effort.</p>	b2	4- 13	3
2	<p><b>Group</b> : each group of students will be assigned to do a search-report about one type the mechanism of a reaction.</p>	a3	14	2

## VII. Schedule of Assessment Tasks for Students During the Semester

Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion % of Total course Assessment	Aligned Course Learning Outcomes
1	Attendance	1 - 15	2	2	a1, a2 b1, b2, b3, b4, b5, b6, b7, c4
2	Assignments (1 + 2)	4, 14	5	5	a3, b2
3	Quiz 1 + Quiz 2	5, 12	3	3	b2, b5, b7
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2 b1, b2, b3, b4, b5, b6, c4
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2 b1, b2, b3, b4, b5, b6, b7, c4
TOTAL			60	60 %	

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes
1	Lab. Attendance	Weekly	5	5 %	b1, c1, c2, c3, d1, d2, d3, d4
2	Lab. Attitude	weekly	2.5	2.5 %	d1, d2, d3, d4
3	Lab. Accomplishments	weekly	5	5 %	b1, c1, c2, c3
4	Lab. Reporting	weekly	2.5	2.5 %	c2
5	Exam of practice theory (written exam or oral exam)	14	5	5 %	b1, c1, c2, c3
6	Practical exam (practical)	14	20	20 %	b1, c1, c2, c3
Total			40	40	

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Cotton . Basic inorganic chemistry
<b>2- Essential References.</b>
2. Bothara. inorganic pharmaceutical chemistry 3. Richard E. Beleil , General chemistry Lab. Manual, 2005, Dakota State university 4. British pharmacopeia, 2013
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of ORGANIC CHEMISTRY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	-----	Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail	-----						

### II. Course Description:

The course concerns with study of the chemistry of carbon and essential classes of organic compounds as an introduction to specific medicinal chemistry courses.

### III. Intended learning outcomes of the course: (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No	PILOs	Intended learning outcomes of the course (CILOs)
1.	A2	a1. Explain the significance of organic chemistry in modern sciences and .
2.	A3	a2. Discuss the properties of Carbon atom, models of structural formula, specific properties and mechanisms of reactions of organic compounds.
3.	B1	b1. Interpret the influence of functional group on physical and chemical properties of organic compounds.
4.		b2. Design a plan to synthesize an organic compound from a parent compound using serial thinking .
5.	B2	b3. Classify organic compounds based on functional group .
6.		b4. Differentiate between different types of organic compounds based on their physical properties, structural formula, molecular formula and chemical reactions
7.	B3	b5 . Name organic compounds using IUPAC nomenclature rules.
8.		b6. Relate functional group in organic compounds to the physical and chemical properties of the compounds.
9.		b7. Predict the catalysts required and the outcomes of a reaction between an organic compound and other chemicals.
10.	C1.	c1. Handle efficiently the tools and chemicals used in chemistry lab.
11.		c2. Operate successfully the instruments used in chemistry lab.
12.	C2	c3 . Perform effectively experimentations of chemical reactions including identification and synthesis of organic compounds in chemistry lab using standard procedures and provide report of his work.
13.		c4 . Draw the structure of organic compounds using structural formula.
14.	C3	c6 .Take the required safety criteria during performing experiments in chemistry lab.
15.	D1	d1. Share successfully in team-work during performing experiments in chemistry lab.
16.	D3	d2. Communicate effectively with his/her colleagues during performing experiments in chemistry lab.
17.	D4	d3. Behave in discipline during performing experiments in chemistry lab.
18.	D5	d4. Demonstrate time management during performing experiments in chemistry lab.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, Lecture-discussion	written exam
a2	Lecture , Lecture-discussion	written exam

### (b) Alignment Course Intended Learning Outcomes of Intellectual Skillsto Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1 , b2	Lectures	Written exam
b3 , b4	Lecture, Lecture-discussion , feed-back learning	written exam , assignment, quizzes
b5, b6, b7	Lecture, Lecture-discussion, feed-back learning	written exam, quizzes

### (c) Alignment Course Intended Learning Outcomes of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment (Lab accomplishments, lab. reporting, practical exam )
c3, c4	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
c5	Lab. Practice	Practical assessment (Lab accomplishment + practical exam )

### (d) Alignment Course Intended Learning Outcomes of Transferable Skillsto Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Lab. Practice	Practical assessment (Attitude)
d2	Lab. Practice,	Practical assessment (Lab Attitude)
d3	Lab. Practice	Practical assessment (Lab Attitude)
d4	Lab. Practice	Practical assessment (Lab Attitude)



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	Aligned Course Learning Outcomes	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to organic chemistry</b>	a1, a2	<ul style="list-style-type: none"> <li>definition, brief history</li> <li>significance of organic chemistry in modern sciences</li> <li>Carbon chemistry: carbon atomic structure, chemical bonds, atomic Orbitals and electron configuration; <math>sp^3</math>, <math>sp^2</math>, sphybridization</li> <li>Physical state</li> <li>stereochemistry of organic compounds</li> <li>isomerism</li> <li>Resonance</li> <li>dipole moment</li> <li>structural theory</li> <li>Models of Structural formula (all-stick formula, dot formula, dash formula, condensed formula, bond-line formula)</li> </ul>	2	6
2	<b>Functional groups &amp; Classification of organic compounds</b>	b1, b2, b3, b4, b5, b6, c4	<ul style="list-style-type: none"> <li>Definition and types of functional groups</li> <li>classification into categories based on functional groups.</li> <li>Role of functional group in physical &amp; chemical properties of organic compounds.</li> <li>Common names Origin</li> <li>IUPAC Nomenclature priority ( which functional group is more important ?)</li> <li>Differences between aliphatic &amp; aromatic organic compounds</li> </ul>	1	3
3	<b>Hydrocarbons</b>	b1, b2, b3, b4, b5, b6, b7, c4	<p><b>(3) Aliphatic (Alkanes, Alkenes, Alkynes, cycloalkanes, cycloalkenes):</b>            definitions, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, synthesis and reactions (including mechanisms of reactions).</p> <p><b>(4) Aromatic hydrocarbon</b> (definitions,</p>	1	

			types, general formula, structural models, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, , synthesis and reactions (including mechanisms of reactions).		
4	<b>Haloalkanes</b>	b1, b2, b3, b4, b5, b6, b7, c4	<ul style="list-style-type: none"> <li>• <b>Aliphatic and aromatic Alkyl halides (Haloalkanes)</b> and organometallic compounds: (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, physical properties, synthesis and reactions (including mechanisms of reactions).</li> </ul>	1	3
<b>MID-TERM EXAM</b>				1	2
5	<b>Aliphatic and aromatic Alcohols , ethers and thioethers</b>	b1, b2, b3, b4, b5, b6, b7, c4	<ul style="list-style-type: none"> <li>• (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, synthesis reactions (including mechanisms of reactions).</li> </ul>	2	
6	<b>Aliphatic and aromatic Amines</b>	b1, b2, b3, b4, b5, b6, b7, c4	<ul style="list-style-type: none"> <li>• (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, synthesis and reactions)</li> </ul>	1	3
7	<b>Aliphatic and aromatic Nitro compounds</b>	b1, b2, b3, b4, b5, b6, b7, c4	<ul style="list-style-type: none"> <li>• : (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, physical properties, synthesis and reactions (including mechanisms of reactions).</li> </ul>	1	3
8	<b>Aliphatic and aromatic aldehydes and ketones</b>	b1, b2, b3, b4, b5, b6, b7, c4	<ul style="list-style-type: none"> <li>• : (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, physical properties, synthesis and reactions)</li> </ul>	2	6
9	<b>Aliphatic and aromatic carboxylic acids</b>	b1, b2, b3, b4, b5, b6, b7, c4	<ul style="list-style-type: none"> <li>• : (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, physical properties, synthesis and reactions (including</li> </ul>	1	3

			mechanisms of reactions).		
10	<b>Aliphatic and aromatic derivatives of carboxylic acids</b>	b1, b2, b3, b4, b5, b6, b7, c4	<b>Esters, acyl halides, acid anhydrides:</b> <ul style="list-style-type: none"> <li>• : (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, physical properties, synthesis and reactions (including mechanisms of reactions).</li> </ul>	1	3
11	<b>Serial synthesis</b>	b2	Synthesis of an organic compound starting from simple parent organic compound.	1	3
<b>Course Review and discussion session</b>				1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				17	49
<b>Number of Weeks /and Units Per Semester</b>				17 weeks	11 units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.

The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**lecture - Discussion**: a short lecture/ address followed by discussion

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

VI. Assignments:				
No	Assignments	Aligned CILOS(symbols)	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve problems at home. The problems are provided by the teacher at the end of each unit. Problems are related to completion of a chemical reaction, nomenclature, draw structures, mechanisms of reactions and others. The student should deliver his/her work every second week in a specific homework booklet. The teacher may ask the student, either personally, or at the class to make sure that the student work belongs to his/her lonely effort.	b2	4- 13	3
2	<b>Group :</b> each group of students will be assigned to do a search-report about one type the mechanism of a reaction.	a3	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion % of Total course Assessment	Aligned Course Learning Outcomes
1	Attendance	1 - 15	2	2	a1, a2 b1, b2, b3, b4, b5, b6, b7, c4
2	Assignments (1 + 2)	4, 14	5	5	a3, b2
3	Quiz 1 + Quiz 2	5, 12	3	3	b2, b5, b7
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2 b1, b2, b3, b4, b5, b6, c4
5	Final exam of theoretical part (	17	40	40	a1, a2 b1, b2, b3, b4, b5,

written exam)				b6, b7, c4
TOTAL		60	60 %	

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes
1	Lab. Attendance	Weekly	5	5 %	b1, c1, c2, c3, d1, d2, d3, d4
2	Lab. Attitude	weekly	2.5	2.5 %	d1, d2, d3, d4
3	Lab. Accomplishments	weekly	2.5	2.5 %	b1, c1, c2, c3
4	Lab. Reporting	weekly	5	5 %	c2
5	Exam of practice theory (written exam or oral exam)	14	5	5 %	b1, c1, c2, c3
6	Practical exam (practical)	14	20	20 %	b1, c1, c2, c3
Total			40	40	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Cotton . Basic inorganic chemistry

### 2- Essential References.

1. Bothara. inorganic pharmaceutical chemistry
2. Richard E. Beleil , General chemistry Lab. Manual, 2005, Dakota State university
3. British pharmacopeia, 2013

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to

	attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### DRUG DISCOVERY & DEVELOPMENT

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	DRUG DISCOVERY & DEVELOPMENT					
2.	Course Code & Number:	PHRM 02					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( FIRST ) Year – ( 2 <sup>ND</sup> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>Introduction to pharmacy profession</li> <li>General chemistry</li> </ul>					
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>Organic chemistry</li> </ul>					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	10/2016					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course is designed to provide students basic knowledge of sources of drugs and modern phases and approaches of drug discovery & development



III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A2	a1. Define drug discovery & drug development and recognize their nowadays requirements.
2.		a2. Determine the main sources of drugs .
3.	A3	a3. Discuss the purposes, phases and modern approaches of drug discovery and development
4.	A4	a4. Recognize his/her role as drug discoverer and developer.
5.	B1	b1. Interpret abbreviations and terms such as HIT , lead, HTS commonly used in drug discovery and development
6.	B2	b2. Compare between various approaches employed in drug discovery and development.
7.	B3	b3. Predict the future progress in drug discovery and development approaches.
8.	C4	c1 .Properly search for information related drug discovery and development using books and suitable media technologies.
9.		c2. Report his/her work efficiently.
10.	D1	d1. Share successfully in team-work.
11.	D4	d2. Comply to pharmacy laws and ethics.
12.	D5	d3. Demonstrate self-learning and time management .

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture	written exam , Practical assessment (Lab accomplishments, Lab. Reporting , practical exam)
a4	lectures	written exam , assignment
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	lecture	Written exam, quiz
b2	Lecture	written exam , quiz
b3	Lecture	written exam
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Feed-back learning ,Group-project.	Written- exam , assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Group-project , feed-back learning	Assignment
d2	lecture	Written exam
d3.	Group-project	assignment

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a4, d2	<ul style="list-style-type: none"> <li>• definitions : drug discovery, drug development</li> <li>• History of drug discovery and development</li> <li>• Requirements of modern drug discovery &amp; development</li> </ul>	2	4
2	<b>Sources of drugs</b>	a2, a4, d2	<ul style="list-style-type: none"> <li>• Natural sources (plant, animals, minerals/earth)</li> <li>• Synthetic sources</li> <li>• Semisynthetic sources</li> <li>• Newer sources: biotechnology including -DNA</li> </ul> With Examples of drugs for each sources	3	6
3	<b>Approaches of drug discovery</b>	a3, a4, b1, b2, b3	<ul style="list-style-type: none"> <li>• Drug targets: definition and types</li> <li>• Definition of Hit</li> <li>• Types of Hit</li> </ul>	1	2
<b>MID-TERM EXAM</b>				1	2
3	<b>Approaches of drug discovery</b>	a3, a4, b1, b2, b3	<ul style="list-style-type: none"> <li>• Hit identification methods               <ul style="list-style-type: none"> <li>○ High throughout screening (HTS)</li> <li>○ Natural substrate</li> <li>○ Pharmacore: Patent burst ; Structure-based technology (Fragments)</li> </ul> </li> </ul>	4	8
4	<b>Phases of drug development</b>	a3, a4, b1, b2, b3	<ul style="list-style-type: none"> <li>• Lead identification</li> <li>• Lead optimization</li> <li>• Animal testing</li> <li>• Clinical trails on human</li> <li>• Re-gristration &amp; approval of the drug</li> </ul>	3	6

			<ul style="list-style-type: none"> <li>• Formulation as dosage forms</li> <li>• Clinical trails of the drug product</li> <li>• Regristration &amp; approval Of the drug product</li> </ul>		
<b>Course Review</b>	a3, a4, b1, b2, b3	Review of the course topics by discussion session.		1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	4 Units

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p> <p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p> <p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>
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## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search-based report on source of one drug	c2, d3	4	6
2	<b>Group</b> : each group of students will be assigned to do a search-based report on one of drug discovery approaches or drug development phases.	c2, d1	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b1, b2, b3, d1, d2, d3
2	Assignments (1 + 2)	4, 14	10	10	c2, d1, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, b1, b2, b3, d1, d2, d3
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, b1, b2, b3, d1, d2, d3
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Donald J Abraham, Burger`s medicinal chemistry and drug discovery: , John Wiley and Sons, Inc
2. Wermuth, Essentials medicinal chemistry

### 2- Essential References.

3. Edward R. Zartler, fragment-based drug discovery a practical approach, 2008 John Wiley & sons, ltd
4. Purcell. A strategy of drug :a guide to biological activity

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

<b>IX.Course Policies:</b>	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of **DRUG DISCOVERY & DEVELOPMENT**

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

I. Course Identification and General Information:							
1.	Course Title:	DRUG DISCOVERY & DEVELOPMENT					
2.	Course Code & Number:	PHRM 02					
3.	Credit hours:	C.H			TOTAL		
		Theoretical		P.		Tr.	
		L.	Tut.	S.			
		1	-	-	-	-	<b>1</b>
4.	Study level/ semester at which this course is offered:	( FIRST ) Year – ( 2 <sup>ND</sup> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>• Introduction to pharmacy profession</li> <li>• General chemistry</li> </ul>					
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>• Organic chemistry</li> </ul>					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10.	Prepared By:						
11.	Date of Approval	<b>10/2016</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

<b>III. Course Description:</b>
The course is designed to provide students basic knowledge of sources of drugs and modern phases and approaches of drug discovery & development

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>3. Alignment CILOs to PILOs</b>		
No.	PILOs	CILOs
1.	A2	a1. Define drug discovery & drug development and recognize their nowadays requirements.
2.		a2. Determine the main sources of drugs .
3.	A3	a3. Discuss the purposes, phases and modern approaches of drug discovery and development
4.	A4	a4. Recognize his/her role as drug discoverer and developer.
5.	B1	b1. Interpret abbreviations and terms such as HIT , lead, HTS commonly used in drug discovery and development
6.	B2	b2. Compare between various approaches employed in drug discovery and development.
7.	B3	b3. Predict the future progress in drug discovery and development approaches.
8.	C4	c1 .Properly search for information related drug discovery and development using books and suitable media technologies.
9.		c2. Report his/her work efficiently.
10.	D1	d1. Share successfully in team-work.
11.	D4	d2. Comply to pharmacy laws and ethics.
12.	D5	d3. Demonstrate self-learning and time management .



<b>4. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture	written exam , Practical assessment (Lab accomplishments, Lab. Reporting , practical exam)
a4	lectures	written exam , assignment
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	lecture	Written exam, quiz
b2	Lecture	written exam , quiz
b3	Lecture	written exam
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Feed-back learning ,Group-project.	Written- exam , assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Group-project , feed-back learning	Assignment
d2	lecture	Written exam
d3.	Group-project	assignment

## V. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a4, d2	<ul style="list-style-type: none"> <li>• definitions : drug discovery, drug development</li> <li>• History of drug discovery and development</li> <li>• Requirements of modern drug discovery &amp; development</li> </ul>	2	4
2	<b>Sources of drugs</b>	a2, a4, d2	<ul style="list-style-type: none"> <li>• Natural sources (plant, animals, minerals/earth)</li> <li>• Synthetic sources</li> <li>• Semisynthetic sources</li> <li>• Newer sources: biotechnology including -DNA</li> </ul> With Examples of drugs for each sources	3	6
3	<b>Approaches of drug discovery</b>	a3, a4, b1, b2, b3	<ul style="list-style-type: none"> <li>• Drug targets: definition and types</li> <li>• Definition of Hit</li> <li>• Types of Hit</li> </ul>	1	2
<b>MID-TERM EXAM</b>				1	2
3	<b>Approaches of drug discovery</b>	a3, a4, b1, b2, b3	<ul style="list-style-type: none"> <li>• Hit identification methods               <ul style="list-style-type: none"> <li>○ High throughout screening (HTS)</li> <li>○ Natural substrate</li> <li>○ Pharmacore: Patent burst ; Structure-based technology (Fragments)</li> </ul> </li> </ul>	4	8
4	<b>Phases of drug development</b>	a3, a4, b1, b2, b3	<ul style="list-style-type: none"> <li>• Lead identification</li> <li>• Lead optimization</li> <li>• Animal testing</li> <li>• Clinical trails on human</li> <li>• Re-gristration &amp; approval of the drug</li> </ul>	3	6

			<ul style="list-style-type: none"> <li>• Formulation as dosage forms</li> <li>• Clinical trails of the drug product</li> <li>• Re-gristration &amp; approval Of the drug product</li> </ul>		
<b>Course Review</b>	a3, a4, b1, b2, b3	Review of the course topics by discussion session.		1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	4 Units

## VI. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VII. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search-based report on source of one drug	c2, d3	4	6
2	<b>Group</b> : each group of students will be assigned to do a search-based report on one of drug discovery approaches or drug development phases.	c2, d1	14	4

### VIII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b1, b2, b3, d1, d2, d3
2	Assignments (1 + 2)	4, 14	10	10	c2, d1, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, b1, b2, b3, d1, d2, d3
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, b1, b2, b3, d1, d2, d3
TOTAL			100	100 %	100

### IX. Learning Resources:

#### 1- Required Textbook(s) ( maximum two ).

5. Donald J Abraham, Burger`s medicinal chemistry and drug discovery: , John Wiley and Sons, Inc
6. Wermuth, Essentials medicinal chemistry

#### 2- Essential References.

7. Edward R. Zartler, fragment-based drug discovery a practical approach, 2008 John Wiley & sons, ltd
8. Purcell. A strategy of drug :a guide to biological activity

#### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

<b>X. Course Policies:</b>	
5.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
6.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
7.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
8.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PSYCHOLOGY

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	PSYCHOLOGY					
2.	Course Code & Number:	MSC 07					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( SECOND ) Year – ( 1 <sup>ST</sup> ) semester					
5.	Pre –requisite (if any):	NONE					
6.	Co –requisite (if any):	NONE					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10.	Prepared By:						
11.	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course focuses on study of development of human personality according to various psychological and the importance of the caring environment for the health of patients.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the schools of psychology and the role of psychology in management of modern diseases
2.		a2. Define the essential psychological concepts such as mental ability, motives and emotions
3.		a3. Determine the basic human psychological needs and the emotional needs of ill people.
4.		a4. Describe various types of personalities and how to deal with each type.
5.	A3	a4. Discuss the stages in development of human personality.
6.	A4	a5. Comprehend his/her roles as a health care professional in dealing with various personalities of patients and grasp their emotional needs.
7.	B2	b1 . Compare between psychiatry, behavior medicine and psychology
8.		b2. Classify personalities of human into various categories.
9.		b3. Differentiate between psychopathic and normal persons.
10.	B4	b4 . Assess the emotional needs of patients. select
11.	C4	c1 . Present his/her thoughts , search for information and report works effectively using language.
12.	D1	d1. Share successfully in team-work.
13.	D2	d2. Show respect to life.
14.	D3	d3. Communicate effectively with patients.

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture, feed-back learning	written exam , assignment
a4, a5	Lecture	written exam

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning	Teaching strategies	Assessment Strategies
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<b>Outcomes</b>		
b1, b2, b3, b4	lecture ,Feed-back learning	Written exam , assignment, quiz
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1	Feed-back learning ,Group-project.	assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1	Group-project , feed-back learning	assignment
d2	lecture, Group-project, feed-back learning	Written exam , assignment
d3.	Group-project, feed-back learning	assignment



<b>IV. Course Content:</b>					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to psychology</b>	a1	<ul style="list-style-type: none"> <li>• Definition, historical progress</li> <li>• Purposes of psychology</li> <li>• schools of psychology.</li> </ul>	2	2
2	<b>Human needs and drives</b>	a3	<ul style="list-style-type: none"> <li>• Basic human needs and biological or primary drives, Secondary social and psychological drives.</li> </ul>	2	2
3	<b>Psychology concepts</b>	a2	<ul style="list-style-type: none"> <li>• Mental ability , Motor skills, motives</li> <li>• Sensation , Conceit , emotion</li> </ul>	2	2
<b>MID-TERM EXAM</b>				1	1
4	<b>Personality</b>	a4,a5, b2, b3, b4, d2	<ul style="list-style-type: none"> <li>• Definition and dimensional types</li> <li>• Growth and environment factors</li> <li>• Relationship between achievement of development stages goals and basic structure of personality.</li> <li>• Types of personalities</li> <li>• Methods of assessment</li> <li>• Dealing and communication with various types of personalities</li> <li>• Differences between psychopathic and normal persons.</li> </ul>	4	4
5	<b>Medical psychology</b>	b1, d2	<ul style="list-style-type: none"> <li>• Fear, anxiety and depression associated with Illness.</li> <li>• Emotional needs of ill persons</li> <li>• Psychological health and behavioral Medicine.</li> <li>• Psychiatry</li> </ul>	3	3
<b>Course Review</b>		a1, a2, a3, a4,a5, b2, b3, b4, d2	Review of the course topics by discussion session.	1	1
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	19
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	Units

## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search-based report on one of the subtopics studies such as : psychology schools and concepts.	a1, b1, b2, b3, c1	4-13	6
2	<b>Group</b> : each group of students will be assigned to do a search report on how to deal with one of the following : <ul style="list-style-type: none"> <li>• Mentally disables</li> <li>• Nervous personalities</li> <li>• Depressed patients</li> <li>• Self-proud persons</li> </ul>	c1, d1, d2, d3	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, b1, b2, b3, b4, d2
2	Assignments (1 + 2)	4-13, 14	10	10	a1, b1, b2, b3, c1, d1, d2, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2, b3
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, b1, b2, b3, b4, d2
<b>TOTAL</b>			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1.
<b>2- Essential References.</b>
2.
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

### IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of psychology

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course focuses on study of development of human personality according to various psychological and the importance of the caring environment for the health of patients.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the schools of psychology and the role of psychology in management of modern diseases
2.		a2. Define the essential psychological concepts such as mental ability, motives and emotions
3.		a3. Determine the basic human psychological needs and the emotional needs of ill people.
4.		a4. Describe various types of personalities and how to deal with each type.
5.	A3	a4. Discuss the stages in development of human personality.
6.	A4	a5. Comprehend his/her roles as a health care professional in dealing with various personalities of patients and grasp their emotional needs.
7.	B2	b1 . Compare between psychiatry, behavior medicine and psychology
8.		b2. Classify personalities of human into various categories.
9.		b3. Differentiate between psychopathic and normal persons.
10.	B4	b4 . Assess the emotional needs of patients. select
11.	C4	c1 . Present his/her thoughts , search for information and report works effectively using language.
12.	D1	d1. Share successfully in team-work.
13.	D2	d2. Show respect to life.
14.	D3	d3. Communicate effectively with patients.

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture, feed-back learning	written exam , assignment
a4, a5	Lecture	written exam

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
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Outcomes		
b1, b2, b3, b4	lecture ,Feed-back learning	Written exam , assignment, quiz
<b>(C) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	Feed-back learning ,Group-project.	assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Group-project , feed-back learning	assignment
d2	lecture, Group-project, feed-back learning	Written exam , assignment
d3.	Group-project, feed-back learning	assignment

<b>IV. Course Content:</b>					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to psychology</b>	a1	<ul style="list-style-type: none"> <li>• Definition, historical progress</li> <li>• Purposes of psychology</li> <li>• schools of psychology.</li> </ul>	2	2
2	<b>Human needs and drives</b>	a3	<ul style="list-style-type: none"> <li>• Basic human needs and biological or primary drives, Secondary social and psychological drives.</li> </ul>	2	2
3	<b>Psychology concepts</b>	a2	<ul style="list-style-type: none"> <li>• Mental ability , Motor skills, motives</li> <li>• Sensation , Conceit , emotion</li> </ul>	2	2
<b>MID-TERM EXAM</b>				1	1
4	<b>Personality</b>	a4,a5, b2, b3, b4, d2	<ul style="list-style-type: none"> <li>• Definition and dimensional types</li> <li>• Growth and environment factors</li> <li>• Relationship between achievement of development stages goals and basic structure of personality.</li> <li>• Types of personalities</li> <li>• Methods of assessment</li> <li>• Dealing and communication with various types of personalities</li> <li>• Differences between psychopathic and normal persons.</li> </ul>	4	4
5	<b>Medical psychology</b>	b1, d2	<ul style="list-style-type: none"> <li>• Fear, anxiety and depression associated with Illness.</li> <li>• Emotional needs of ill persons</li> <li>• Psychological health and behavioral Medicine.</li> <li>• Psychiatry</li> </ul>	3	3
<b>Course Review</b>		a1, a2, a3, a4,a5, b2, b3, b4, d2	Review of the course topics by discussion session.	1	1



FINAL - EXAM	1	2
TOTAL	16	19
Number of Weeks /and Units Per Semester	16 weeks	5 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search-based report on one of the subtopics studies such as : psychology schools and concepts.	a1, b1, b2, b3, c1	4-13	6
2	<b>Group</b> : each group of students will be assigned to do a search report on how to deal with one of the following : <ul style="list-style-type: none"> <li>• Mentally disables</li> <li>• Nervous personalities</li> <li>• Depressed patients</li> <li>• Self-proud persons</li> </ul>	c1, d1, d2, d3	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, b1, b2, b3, b4, d2
2	Assignments (1 + 2)	4-13, 14	10	10	a1, b1, b2, b3, c1, d1, d2, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2, b3
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, b1, b2, b3, b4, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

1- Required Textbook(s) ( maximum two ).

3.

2- Essential References.

4.

3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

IX.Course Policies:	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PHYSIOLOGY I

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	PHYSIOLOGY I					
2.	Course Code & Number:	MSC 08					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( SECOND ) Year – ( 1 <sup>ST</sup> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General biology</li> <li>Anatomy &amp; histology</li> </ul>					
6.	Co –requisite (if any):	-----					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course concerns with study of cell repair mechanism, transport mechanism through cell membrane, body fluids , acid-base balance as well as with functions and regulation of organs o the nervous system, endocrine and skeletal system.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Discuss the concept of homeostasis and feedback mechanisms observed in normal functions of human body organs.
2.		a2. . Identify the mechanisms of transport of material into and out of human cells.
3.		a3. Determine the normal functions and regulation of nervous system, endocrine glands and muscles.
4.	A2	a4. Explain the biological role of certain endogenous substances in regulation the normal functions of nervous system, endocrine glands and muscles.
5.	B1	b1. Identify the signs of normal functions of nervous system, endocrine glands and muscles.
6.		b2. Interpret the outcomes of normal functions of nervous system, endocrine glands and muscles.
7.	B2	b3. Classify neurotransmitters and hormones physiologically.
8.		b4. Compare physiologically between different types of nervous system, endocrine glands and muscles.
9.		b5 .Relate the normal functions in nervous system, endocrine glands and muscles to their affecting factors.
10.	B4	b6 . Assess the normal functions of nervous system, endocrine glands and muscles
11.	C4	c1. Present his/her thoughts , search for information and report works effectively using appropriate references books , internet and technologies media
12.	D1	d1. Share successfully in team-work.
13.	D2	d2. Show respect to life.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture,, laboratory practice	written exam , , assignment
a4	Lecture, feed-back learning	written exam , assignment

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Feed-back learning, Group-project.	Written exam
b3, b4	Lecture, , feed-back learning	written exam , quizzes
b5	Lecture, feed-back learning	written exam, quizzes
b6	Lecture	written exam

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	Feed-back learning ,Group-project.	assignment

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Group-project ,, feed-back learning	Assignment
d2	lecture	Written exam

IV. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a4, b4, b5	physiology definition, the concept of homeostasis. Negative feedback.	1	2
2	<b>The Cell and body fluids physiology</b>	a2, a4, b1,b2, b4, b4, b5, d1, d2	<ul style="list-style-type: none"> <li>• structure, functions, membrane transport mechanisms: (passive diffusion , mediated transport, osmosis)</li> <li>• membrane potential(resting, action)</li> <li>• Cell repair : mechanisms.</li> <li>• Composition and regulations of Body fluids, electrolytes and acid-base balance</li> </ul>	2	4
3	<b>The Nervous system</b>	a3, a4, b4, b5, b6,d1, d2	<ul style="list-style-type: none"> <li>• Classification of nervous system</li> <li>• classes of neurons</li> <li>• Synaptic transmission ( chemical synapsis, summation, interconnection between neurons, factors affecting the transmission)</li> </ul>	1	2
4	<b>Central nervous system (CNS) Part (1)</b>	a3, a4, b4, b5, b6,d1, d2	<ul style="list-style-type: none"> <li>• Components of CNS</li> <li>• level of CNS functions</li> <li>• functions of brain composition (cerebrum, cerebral cortex, etc. ),</li> <li>• blood brain barrier</li> <li>• spinal cord (function, composition, spinal reflex, cerebrospinal fluid)</li> </ul>	2	4
<b>MID-TERM EXAM</b>				1	2
4	<b>Central nervous system (CNS) Part (2)</b>	a3, a4, b4, b5, b6,d1, d2	<ul style="list-style-type: none"> <li>• Sensation: nociception, hyperalgesia, pain pathway, neurotransmitters of pain, types of pain (cutaneous, visceral, deep, , referred , phantom) , endogenous analgesic system</li> <li>• Regulating areas in brain</li> </ul>	2	4

			(function, neurotransmitters) : nociceptionarea, psychic area, heat regulating center, area controlling muscles relaxation and contraction vasomotor center, Chemoreceptor trigger zone and other areas involved in diseases.		
5	<b>Autonomic nervous system</b>	a3, a4, b4, b5, b6,d1, d2	<ul style="list-style-type: none"> <li>• definition and composition &amp; regulation</li> <li>• sympathetic system (functions, neurotransmitters, receptors), adrenal medulla ,</li> <li>• parasympathetic system (functions, neurotransmitters, receptors)</li> </ul>	2	4
6	<b>Endocrine system</b>	a3, a4, b4, b5, b6,d1, d2	<ul style="list-style-type: none"> <li>• hormones (biochemical classification, transport, mechanism of actions)</li> <li>• functions and regulation of</li> <li>• hormones of (pituitary gland, thyroid gland, parathyroid gland, pancreas, sex organs)</li> </ul>	2	4
7	<b>Muscles</b>	a3, a4, b4, b5, b6,d1, d2	<ul style="list-style-type: none"> <li>• types , functions</li> <li>• factors affecting contraction and relaxation</li> </ul>	1	2
<b>Course Review</b>		a3, a4, b4, b5, b6,d1, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search on one endogenous mediator that is involved in one of the physiological studied and provide a summary report on it.	a3, c1, d1	4-13	6
2	<b>Group</b> : each group of students will be assigned to do a search on one of the physiological processes studied and make a summary report.	a4, c1	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b4, b5, b6,c1, d1, d2
2	Assignments (1 + 2)	4, 14	10	10	a3, a4, c1, d1
3	Quiz 1 + Quiz 2	7, 12	5	5	b3, b4, b5
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, b4, b5, b6,c1, d1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, b4, b5, b6,c1, d1, d2
<b>TOTAL</b>			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. C.C.Chatterjee. Human physiology
2. Laurie kelly . Essential of human physiology for pharmacy, 2004, CRC press

### 2- Essential References.

1. Hassan Hamdi, Fundamentals of human physiology
2. Salah Abu-Sitta , Synopsis of medical physiology
3. W. F. Ganong. Review of medical physiology

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

### IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of PHYSIOLOGY I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
<p>The course concerns with study of cell repair mechanism, transport mechanism through cell membrane, body fluids , acid-base balance as well as with functions and regulation of organs o the nervous system, endocrine and skeletal system.</p>

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
3. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A1	a1. Discuss the concept of homeostasis and feedback mechanisms observed in normal functions of human body organs.
2.		a2. . Identify the mechanisms of transport of material into and out of human cells.
3.		a3. Determine the normal functions and regulation of nervous system, endocrine glands and muscles.
4.	A2	a4. Explain the biological role of certain endogenous substances in regulation the normal functions of nervous system, endocrine glands and muscles.
5.	B1	b1. Identify the signs of normal functions of nervous system, endocrine glands and muscles.
6.		b2. Interpret the outcomes of normal functions of nervous system, endocrine glands and muscles.
7.	B2	b3. Classify neurotransmitters and hormones physiologically.
8.		b4. Compare physiologically between different types of nervous system, endocrine glands and muscles.
9.		b5 .Relate the normal functions in nervous system, endocrine glands and muscles to their affecting factors.
10.	B4	b6 . Assess the normal functions of nervous system, endocrine glands and muscles
11.	C4	c1. Present his/her thoughts , search for information and report works effectively using appropriate references books , internet and technologies media
12.	D1	d1. Share successfully in team-work.
13.	D2	d2. Show respect to life.

#### 4. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture,, laboratory practice	written exam , , assignment
a4	Lecture, feed-back learning	written exam , assignment

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skillsto Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Feed-back learning , Group-project.	Written exam
b3, b4	Lecture, , feed-back learning	written exam , quizzes
b5	Lecture, feed-back learning	written exam, quizzes
b6	Lecture	written exam

##### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	Feed-back learning ,Group-project.	assignment

##### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Group-project , , feed-back learning	Assignment
d2	lecture	Written exam

IV. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a4, b4, b5	physiology definition, the concept of homeostasis. Negative feedback.	1	2
2	<b>The Cell and body fluids physiology</b>	a2, a4, b1,b2, b4, b4, b5, d1, d2	<ul style="list-style-type: none"> <li>• structure, functions, membrane transport mechanisms: (passive diffusion , mediated transport, osmosis)</li> <li>• membrane potential(resting, action)</li> <li>• Cell repair : mechanisms.</li> <li>• Composition and regulations of Body fluids, electrolytes and acid-base balance</li> </ul>	2	4
3	<b>The Nervous system</b>	a3, a4, b4, b5, b6,d1, d2	<ul style="list-style-type: none"> <li>• Classification of nervous system</li> <li>• classes of neurons</li> <li>• Synaptic transmission ( chemical synapsis, summation, interconnection between neurons, factors affecting the transmission)</li> </ul>	1	2
4	<b>Central nervous system (CNS) Part (1)</b>	a3, a4, b4, b5, b6,d1, d2	<ul style="list-style-type: none"> <li>• Components of CNS</li> <li>• level of CNS functions</li> <li>• functions of brain composition (cerebrum, cerebral cortex, etc. ),</li> <li>• blood brain barrier</li> <li>• spinal cord (function, composition, spinal reflex, cerebrospinal fluid)</li> </ul>	2	4
<b>MID-TERM EXAM</b>				1	2
4	<b>Central nervous system (CNS) Part (2)</b>	a3, a4, b4, b5, b6,d1, d2	<ul style="list-style-type: none"> <li>• Sensation: nociception, hyperalgesia, pain pathway, neurotransmitters of pain, types of pain (cutaneous, visceral, deep, , referred , phantom) , endogenous analgesic system</li> <li>• Regulating areas in brain</li> </ul>	2	4

			(function, neurotransmitters) : nociception area, psychic area, heat regulating center, area controlling muscles relaxation and contraction vasomotor center, Chemoreceptor trigger zone and other areas involved in diseases.		
5	<b>Autonomic nervous system</b>	a3, a4, b4, b5, b6,d1, d2	<ul style="list-style-type: none"> <li>• definition and composition &amp; regulation</li> <li>• sympathetic system (functions, neurotransmitters, receptors), adrenal medulla ,</li> <li>• parasympathetic system (functions, neurotransmitters, receptors)</li> </ul>	2	4
6	<b>Endocrine system</b>	a3, a4, b4, b5, b6,d1, d2	<ul style="list-style-type: none"> <li>• hormones (biochemical classification, transport, mechanism of actions)</li> <li>• functions and regulation of</li> <li>• hormones of (pituitary gland, thyroid gland, parathyroid gland, pancreas, sex organs)</li> </ul>	2	4
7	<b>Muscles</b>	a3, a4, b4, b5, b6,d1, d2	<ul style="list-style-type: none"> <li>• types , functions</li> <li>• factors affecting contraction and relaxation</li> </ul>	1	2
<b>Course Review</b>		a3, a4, b4, b5, b6,d1, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.

The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search on one endogenous mediator that is involved in one of the physiological studied and provide a summary report on it.	a3, c1, d1	4-13	6
2	<b>Group</b> : each group of students will be assigned todo a search on one of the physiological processes studied and make a summary report.	a4, c1	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b4, b5, b6,c1, d1, d2
2	Assignments (1 + 2)	4, 14	10	10	a3, a4, c1, d1
3	Quiz 1 + Quiz 2	7, 12	5	5	b3, b4, b5
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, b4, b5, b6,c1, d1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, b4, b5, b6,c1, d1, d2
<b>TOTAL</b>			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

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### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

IX.Course Policies:	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
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5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### MEDICAL BIOCHEMISTRY

<b>I. Course Identification and General Information:</b>						
1.	Course Title:	MEDICAL BIOCHEMISTRY				
2.	Course Code & Number:	MSC 09				
3.	Credit hours:	C.H			TOTAL	
		Theoretical		P.		Tr.
		L.	Tut.			
		2	-	-		1
4.	Study level/ semester at which this course is offered:	( SECOND ) Year – ( 1 <sup>ST</sup> ) semester				
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General chemistry</li> <li>Organic chemistry</li> <li>General biology</li> </ul>				
6.	Co –requisite (if any):	-----				
7.	Program (s) in which the course is offered:	All BC programs offered by the university				
8.	Language of teaching the course:	ENGLISH				
9.	Location of teaching the course:	IN THE UNIVERSITY				
10	Prepared By:					
11	Date of Approval	<b>10/2014</b>				

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course deals study of the types of biochemical compounds, including carbohydrates, lipids, proteins, enzymes , vitamins and nucleic acids, and the changes to which are undergone to in the body.

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A1	a1. Identify the biochemical compounds and that have significant roles in human and living organisms bodies.
2.	A2	a2. Explicit the physiological/pathological involvement of carbohydrates, lipids, proteins and other biochemicals.
3.	A3	a3. Discuss the biosynthesis and metabolic pathways of biochemical compounds.
4.	B1	b1. Interpret certain body diseases based on disturbances in levels of body biochemicals
5.	B2	b2 . Solve biochemical problems related to nomenclature, synthetic and metabolic reactions.
6.		b3. Classify biochemicals into various categories.
7.		b4. Compare between different types of biochemical synthesis or metabolic reactions based on their income and outcomes products.
8.	B3	b5. Predict the outcomes of biochemical reactions.
9.	C1	c1. Handle efficiently the tools and chemicals used in biochemistry Lab.
10.		c2. Operate successfully the instruments used in biochemistry Lab.
11.	C2	c3 . Perform efficiently experiments and practical tasks for in vitro and in vivo identifications of biochemical compounds using standard procedures.
12.		c4. Take and prepare human samples to biochemistry investigations using standard procedures.
13.	C3	c5 .Take the required safety criteria during performing practical works in in biochemistry Lab.
14.	C4	c6 .Appropriately search for information and also present and report his/her work using various source of information and media technologies..
15.		c7. Use effectively symbols and figures and drawing to express chemical reactions and synthesis
16.	D1	d1. Share successfully in team-work.
17.	D2	d2. Show respect to life.

18.	D3	d3. Communicate effectively with his/her colleagues during performing practical works in in biochemistry Lab.
19.	D4	d4. behave in discipline during performing practical works in biochemistry Lab.
20.	D5	d5. Demonstrate time management and self-learning during performing assignments and during practical works in in biochemistry Lab.

2. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, laboratory practice	written exam , Practical assessment
a2	Lecture,, feed-back learning	written exam , assignment
a3	Lecture, feed-back learning, Group-project.	written exam , assignment
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	lecture, group-project, feed-back learning	Written exam, assignments
b2 , b3, b4	Lecture, , feed-back learning	written exam , quizzes
b5	Lecture,, feed-back learning	written exam, quizzes
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment
c3, c4	Lab. Practice	Practical assessment
c5	Lab. Practice	Practical assessment
c6, c7	Group-project, feed-back learning	Written- exam , practical assessment , assignments

<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1</b>	<b>Group-project , feed-back learning</b>	<b>Assignment , Practical assessment</b>
<b>d2</b>	<b>lecture</b>	<b>Written exam</b>
<b>d3.</b>	<b>Lab. Practice</b>	<b>Practical assessment</b>
<b>d4</b>	<b>Lab. Practice</b>	<b>Practical assessment (Lab Attitude)</b>
<b>d5</b>	<b>Lab. Practice , Group-project</b>	<b>Practical assessment , assignment</b>

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Carbohydrates</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>• Classifications and physiological roles</li> <li>• Glycolysis</li> <li>• Citric acid cycle</li> <li>• Glycogenesis and glycogenolysis</li> <li>• Hexose monophosphate shunt</li> <li>• Uronic acid pathway</li> <li>• Blood sugar and its regulation.</li> <li>• Pathological conditions related carbohydrates.</li> </ul>	3	6
2	<b>Lipids</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>• Classifications and physiological roles</li> <li>• Biosynthesis of fats</li> <li>• Oxidation of fatty acids</li> <li>• Ketogenesis and ketosis</li> <li>• Metabolism of cholesterol</li> <li>• Essential fatty acid and eicosanodis phospholipids.</li> <li>• Sphingolipids.</li> <li>• Bile salts</li> <li>• Pathological conditions related to lipids.</li> </ul>	2	4
<b>MID-TERM EXAM</b>				1	2
3	<b>Proteins</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>• Classification of aminoacides</li> <li>• General biochemical reaction of amino acids like</li> <li>• Transamination</li> <li>• Deamination</li> <li>• Decarboxylation</li> <li>• Peptides and polypeptides</li> <li>• Biosynthesis of proteins : role of DNA</li> <li>• Classifications and physiological roles of proteins</li> <li>• Metabolism of proteins</li> <li>• Urea cycle</li> <li>• Nitrogen balance</li> <li>• Pathological conditions related to</li> </ul>	2	4



			proteins.		
4	<b>Enzymes</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>Classifications and physiological roles</li> <li>Nomenclature</li> <li>Factors affecting enzyme action</li> <li>Enzyme kinetics</li> <li>Cytochrome P450 enzymes : classification, roles, stimulation and inhibition</li> <li>Pathological conditions related to enzymes.</li> </ul>	2	4
5	<b>Vitamins and minerals</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>Classifications and physiological roles</li> <li>Vitamins as coenzymes and their significance</li> <li>Metals as co-factors</li> <li>Role and significant of minerals and trace elements</li> </ul>	2	4
6	<b>Nucleic acids</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>Basic structures</li> <li>Types (DNA, RNA), roles , biosynthesis and catabolism</li> <li>DNA replication and mutation</li> <li>DNA repair mechanism</li> </ul>	1	2
7	<b>Hormones</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	biosynthesis , catabolism and Pathological conditions related to : <ul style="list-style-type: none"> <li>Insulin</li> <li>Thyroxin</li> <li>Corticosteroids</li> </ul>	1	2
	<b>Course Review</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs
1.	<b>introduction to biochemistry chemistry Lab.:</b> safety requirements, list of experiments, How to report, etc	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
2.	<b>carbohydrates</b> monosaccharaides : physicochemical properties and in vitro identification & differentiation.	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
3.	<b>carbohydrates</b> disaccharides physicochemical properties and in vitro identification & differentiation.	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
4.	<b>carbohydrates</b> polysaccharides physicochemical properties and in vitro identification & differentiation.	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
5.	<b>Sampling and preserving of human samples : blood, urine</b>		2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
6.	<b>Bioassay of blood glucose</b>	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
7.	<b>Lipids</b> physicochemical properties and in vitro identification of cholesterol.	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
8.	<b>Assay of cholesterol in human blood.</b>	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
9.	<b>Proteins:</b> physicochemical properties and in vitro identification of certain types of proteins	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
10.	<b>bioassay of certain enzymes related to hepatic function e.g. GPT</b>	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
11.	<b>bioassay of thyroxin hormones.</b>	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
<b>PRACTICAL EXAM</b>		1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
<b>Total</b>		12	24 equivalent to 12	

		<b>credit hours</b>	
<b>Number of Weeks</b>		<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with biochemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b2, c5, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to present a search report on one pathological condition related to disturbances in biochemical levels in the body.	b1, d1, d5, c6	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b1, b2, c5, c6, d1, d4, d5
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b2, b5
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
2	Lab. Attitude	weekly	2.5	2.5	d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	c1, c2, c3
4	Lab. Reporting	weekly	2.5	2.5	c6, c7
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
6	Practical exam (practical)	14	20	20	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
Total			40	40 %	

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Pamela C. Champe, Lippincott's illustrated review in Biochemistry, 2010, Lippincott William & Wilkins
<b>2- Essential References.</b>
1. Hiram f. Gilbert , Basic concepts in biochemistry ; a student's survival guide, 2000, McGraw-Hill 2. Vyas . Pharmaceutical biochemistry
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of medical biochemistry

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

### II. Course Description:

The course deals study of the types of biochemical compounds, including carbohydrates, lipids, proteins, enzymes , vitamins and nucleic acids, and the changes to which are undergone to in the body.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A1	a1. Identify the biochemical compounds and that have significant roles in human and living organisms bodies.
2.	A2	a2. Explicit the physiological/pathological involvement of carbohydrates, lipids, proteins and other biochemicals.
3.	A3	a3. Discuss the biosynthesis and metabolic pathways of biochemical compounds.
4.	B1	b1. Interpret certain body diseases based on disturbances in levels of body biochemicals
5.	B2	b2 . Solve biochemical problems related to nomenclature, synthetic and metabolic reactions.
6.		b3. Classify biochemicals into various categories.
7.		b4. Compare between different types of biochemical synthesis or metabolic reactions based on their income and outcomes products.
8.	B3	b5. Predict the outcomes of biochemical reactions.
9.	C1	c1.Handle efficiently the tools and chemicals used in biochemistry Lab.
10.		c2. Operate successfully the instruments used in biochemistry Lab.
11.	C2	c3 . Perform efficiently experiments and practical tasks for in vitro and in vivo identifications of biochemical compounds using standard procedures.
12.		c4. Take and prepare human samples to biochemistry investigations using standard procedures.
13.	C3	c5 .Take the required safety criteria during performing practical works in in biochemistry Lab.
14.	C4	c6 .Appropriately search for information and also present and report his/her work using various source of information and media technologies..
15.		c7. Use effectively symbols and figures and drawing to express chemical reactions and synthesis
16.	D1	d1. Share successfully in team-work.
17.	D2	d2. Show respect to life.

18.	D3	d3. Communicate effectively with his/her colleagues during performing practical works in in biochemistry Lab.
19.	D4	d4. behave in discipline during performing practical works in biochemistry Lab.
20.	D5	d5. Demonstrate time management and self-learning during performing assignments and during practical works in in biochemistry Lab.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, laboratory practice	written exam , Practical assessment
a2	Lecture, , feed-back learning	written exam , assignment
a3	Lecture, feed-back learning, Group-project.	written exam , assignment

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	lecture, group-project, feed-back learning	Written exam, assignments
b2 , b3, b4	Lecture, , feed-back learning	written exam , quizzes
b5	Lecture, , feed-back learning	written exam, quizzes

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment
c3, c4	Lab. Practice	Practical assessment
c5	Lab. Practice	Practical assessment
c6, c7	Group-project, feed-back learning	Written- exam , practical assessment , assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
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<b>d1</b>	<b>Group-project , feed-back learning</b>	<b>Assignment , Practical assessment</b>
<b>d2</b>	<b>lecture</b>	<b>Written exam</b>
<b>d3.</b>	<b>Lab. Practice</b>	<b>Practical assessment</b>
<b>d4</b>	<b>Lab. Practice</b>	<b>Practical assessment (Lab Attitude)</b>
<b>d5</b>	<b>Lab. Practice , Group-project</b>	<b>Practical assessment , assignment</b>

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Carbohydrates</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>• Classifications and physiological roles</li> <li>• Glycolysis</li> <li>• Citric acid cycle</li> <li>• Glycogenesis and glycogenolysis</li> <li>• Hexose monophosphate shunt</li> <li>• Uronic acid pathway</li> <li>• Blood sugar and its regulation.</li> <li>• Pathological conditions related carbohydrates.</li> </ul>	3	6
2	<b>Lipids</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>• Classifications and physiological roles</li> <li>• Biosynthesis of fats</li> <li>• Oxidation of fatty acids</li> <li>• Ketogenesis and ketosis</li> <li>• Metabolism of cholesterol</li> <li>• Essential fatty acid and eicosanodis phospholipids.</li> <li>• Sphingolipids.</li> <li>• Bile salts</li> <li>• Pathological conditions related to lipids.</li> </ul>	2	4
<b>MID-TERM EXAM</b>				1	2
3	<b>Proteins</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>• Classification of aminoacides</li> <li>• General biochemical reaction of amino acids like</li> <li>• Transamination</li> <li>• Deamination</li> <li>• Decarboxylation</li> <li>• Peptides and polypeptides</li> <li>• Biosynthesis of proteins : role of DNA</li> <li>• Classifications and physiological roles of proteins</li> <li>• Metabolism of proteins</li> <li>• Urea cycle</li> </ul>	2	4

			<ul style="list-style-type: none"> <li>Nitrogen balance</li> <li>Pathological conditions related to proteins.</li> </ul>		
4	<b>Enzymes</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>Classifications and physiological roles</li> <li>Nomenclature</li> <li>Factors affecting enzyme action</li> <li>Enzyme kinetics</li> <li>Cytochrome P450 enzymes : classification, roles, stimulation and inhibition</li> <li>Pathological conditions related to enzymes.</li> </ul>	2	4
5	<b>Vitamins and minerals</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>Classifications and physiological roles</li> <li>Vitamins as coenzymes and their significance</li> <li>Metals as co-factors</li> <li>Role and significant of minerals and trace elements</li> </ul>	2	4
6	<b>Nucleic acids</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>Basic structures</li> <li>Types (DNA, RNA), roles , biosynthesis and catabolism</li> <li>DNA replication and mutation</li> <li>DNA repair mechanism</li> </ul>	1	2
7	<b>Hormones</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	biosynthesis , catabolism and Pathological conditions related to : <ul style="list-style-type: none"> <li>Insulin</li> <li>Thyroxin</li> <li>Corticosteroids</li> </ul>	1	2
	<b>Course Review</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Intended Learning Outcomes CILOs</b>
1.	<b>introduction to biochemistry chemistry</b> Lab.: safety requirements, list of experiments, How to report, etc	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
2.	<b>carbohydrates monosaccharaides</b> : physicochemical properties and in vitro identification & differentiation.	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
3.	<b>carbohydrates disaccharides</b> physicochemical properties and in vitro identification & differentiation.	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
4.	<b>carbohydrates polysaccharides</b> physicochemical properties and in vitro identification & differentiation.	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
5.	<b>Sampling and preserving of human samples : blood, urine</b>		2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
6.	<b>Bioassay of blood glucose</b>	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
7.	<b>Lipids</b> physicochemical properties and in vitro identification of cholesterol.	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
8.	<b>Assay of cholesterol in human blood.</b>	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
9.	<b>Proteins:</b> physicochemical properties and in vitro identification of certain types of proteins	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
10.	<b>bioassay of certain enzymes related to hepatic function e.g. GPT</b>	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
11.	<b>bioassay of thyroxin hormones.</b>	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
<b>PRACTICAL EXAM</b>		1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	

Number of Weeks	12
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## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Laboratory practice**: students doing experiments in labs individually or in small groups
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with biochemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b2, c5, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to present a search report on one pathological condition related to disturbances in biochemical levels in the body.	b1, d1, d5, c6	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b1, b2, c5, c6, d1, d4, d5
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b2, b5
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
2	Lab. Attitude	weekly	2.5	2.5	d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	c1, c2, c3
4	Lab. Reporting	weekly	2.5	2.5	c6, c7
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
6	Practical exam (practical)	14	20	20	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4, d5
Total			40	40 %	

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Pamela C. Champe, Lippincott's illustrated review in Biochemistry, 2010, Lippincott William & Wilkins
<b>2- Essential References.</b>
1. Hiram f. Gilbert , Basic concepts in biochemistry ; a student's survival guide, 2000, McGraw-Hill 2. Vyas . Pharmaceutical biochemistry
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## X. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### BOTANY

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	BOTANY					
2.	Course Code & Number:	PHRG 01					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	<i>( SECOND ) Year – ( 1<sup>ST</sup> ) semester</i>					
5.	Pre –requisite (if any):	• General biology					
6.	Co –requisite (if any):	-----					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course provides essential knowledge and skills in plants as an introduction to pharmacognosy and phytochemistry courses.



<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	<b>A1</b>	<b>a1.</b> Identify the general characters, life cycles and nutritional sources of the common orders, families, genera and species of the plant kingdom
2.		<b>a2.</b> Describe the types morphological and microscopical features of plant seeds, roots, leaves, stems , barks, flowers and fruits
3.		<b>a3.</b> Determine the structural/functional components and biological processes of plant cell and the anatomical and physiological features of tissues and systems in common plant species.
4.	<b>A2</b>	<b>a4.</b> Explicit the economic and medical uses of common plant genera and species in particular plants belonging to Angiosperm .
5.	<b>B2</b>	<b>b1.</b> Differentiate between various plant species based on their morphological and microscopical features.
6.		<b>b2 .</b> Classify plant kingdom into orders, families, genera and species.
7.		<b>b3.</b> Compare between animal cell and plant cell.
8.	<b>C1</b>	<b>c1.</b> Handle efficiently the tools and chemicals used in botany Lab.
9.		<b>c2.</b> Operate successfully the instruments used in botany Lab.
10.	<b>C2</b>	<b>c3 .</b> Perform effectively the experiments and practical tasks and including morphological & microscopical identification of plant species using standard procedures.
11.	<b>C3</b>	<b>c4 .</b> Take the required safety criteria during performing experiments in botany Lab.
12.	<b>C4</b>	<b>c5 .</b> Search efficiently for information using documented and electronic sources of information.
13.		<b>c6.</b> Present and report his/her works correctly using appropriate writing rules and technologies media.
14.	<b>D1</b>	<b>d1.</b> Share successfully in team-work.
15.	<b>D2</b>	<b>d2.</b> Show respect to life.
16.	<b>D3</b>	<b>d3.</b> Communicate effectively with his/her colleagues.
17.	<b>D4</b>	<b>d4.</b> Behave in discipline during practicing experiments in botany lab.
18.	<b>D5</b>	<b>d5.</b> Demonstrate time management and self-learning.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	laboratory practice , lecture	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam) , Written exam , Attendance
a3, a4	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture	Written exam , Attendance
b2, b3	Lecture, Feed-back learning	Written exam , Attendance quizzes
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	Feed-back learning , Group-project	Assignments
c6	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam) , Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice , Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) , Assignments
d2	Lecture	Written exam , Attendance

d5	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments
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## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to botany</b>	a1, a3, a4,b1, b2,b3, d2	<ul style="list-style-type: none"> <li>• Definition and Brief history of botany</li> <li>• Basis of plant structures: plant cell and plant cellular contents , types of plant tissues and plant organs</li> <li>• Differences between plant kingdom and animal kingdom</li> <li>• <b>Nutrition, metabolism and growth of plant</b></li> <li>• Plant taxonomy : basis of classification of plant kingdom into orders, families,, suborders, genera, species.</li> </ul>	2	4
2	<b>Plant Order (1) THALLOPHYTES( Thallophyta)</b>	a1, a3, a4,b1, b2, d2	<ul style="list-style-type: none"> <li>• General characters</li> <li>• <b>Algae</b>.g. Pleurococcus, Spirogyra, Vaucheria, Diatoms.), economic use of algae</li> <li>• <b>Fungi</b> : differences from algae, types phycomycetes (oomycetes e.g. saprolegnia), (zygomycetes e.g. black mold) eumycetes (ascomycetes e.g. yeasts: Ergot fungi ) (Basidiomycetes edible mushroom, amanita) economic use of fungi</li> <li>• <b>lichens</b> types and examples</li> <li>• <b>Bacteria</b> (only brief study on general characters and differences from fungi, algae and lichens.</li> <li>• <b>Viruses</b> : general characters, examples</li> </ul>	2	4
3	<b>Plant order (2) ARCHEGONIAT ES(Archegoniatae)</b>	a1, a3, a4,b1, b2, d2	<ul style="list-style-type: none"> <li>• General characters</li> <li>• Bryophytes e.g. Hepaticae, mosses</li> <li>• Pteridophytes e.g. Ferns, club mosses</li> </ul>	2	4
4	<b>Plant order (3) SPERMOPHYTES (seedling plants)</b>	a1, a3, a4,b1, b2, d2	<ul style="list-style-type: none"> <li>• Gymnosperms , characters, differences, examples of plants</li> <li>• Angiosperms: characters, differences, economically and medically valuable families.</li> </ul>	1	2
MID-TERM EXAM				1	2

5	<b>Plant parts in Angiosperms</b>	a1, a2, a3, a4, b1, b2, d2	(morphology, anatomy and physiology) of : <ul style="list-style-type: none"> <li>• The roots</li> <li>• The stems</li> <li>• The bark</li> <li>• The leaf</li> <li>• The flower</li> <li>• The fruit</li> <li>• The seed</li> </ul>	3	6
6	<b>classification of angiosperms yielding vegetable drugs.</b>	a1, a3, a4, b1, b2, d2	<ul style="list-style-type: none"> <li>• <b>Monocotyledons</b> : general characters, classification, examples of plants and their yielding drugs</li> <li>• <b>Dicotyledons</b> : (Archichlamydeae or Choripetalae, Metachlamydeas or Sympetalas): general characters, classification, examples of plants and their yielding drugs</li> </ul>	3	9
	<b>Course Review</b>	a1, a2, a3, a4, b1, b2, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Couse Intended Learning Outcomes CILOs</b>
1.	introduction to pharmaceutical organic chemistry Lab.: safety requirements, list of experiments, How to report, etc.	1	2	a1, a2, c1, c2, c3, c4, c6, d1, d2, d3, d4, d5
2.	Algae: microscopical slides	1	2	a1, a2, c1, c2, c3, c4, c6, d1, d2, d3, d4, d5
3.	Fungi: microscopical and morphological features of different fungi species	2	4	a1, a2, c1, c2, c3, c4, c6, d1, d2, d3, d4, d5
4.	Plant leaves: morphology and microscopy	2	4	a1, a2, c1, c2, c3, c4, c6, d1, d2, d3, d4, d5
5.	Plant barks: morphology and microscopy	1	2	a1, a2, c1, c2, c3, c4, c6, d1, d2, d3, d4, d5
6.	Plant roots and rhizomes: morphology and microscopy	1	2	a1, a2, c1, c2, c3, c4, c6, d1, d2, d3, d4, d5
7.	Plant flowers: morphology and microscopy	1	2	a1, a2, c1, c2, c3, c4, c6, d1, d2, d3, d4, d5
8.	Plant fruits: morphology and microscopy	1	2	a1, a2, c1, c2, c3, c4, c6, d1, d2, d3, d4, d5
9.	Differentiation between Monocotyledons Dicotyledons : morphology and microscopy	1	2	a1, a2, c1, c2, c3, c4, c6, d1, d2, d3, d4, d5
PRACTICAL EXAM		1	2	a1, a2, b2, c1, c2, c3, c4, c6, d1, d3, d4, d5
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Seminars**: these are mainly used with small groups of students (20-30) students in which they find better chances for discussing and participating in the teaching process.

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search report on one species of one medically valuable plant family.	c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to do a search report supported with illustrating videos on one of the followings : <ul style="list-style-type: none"> <li>Plant taxonomy</li> <li>Plant cell</li> <li>Algae</li> <li>phycomycetes</li> </ul>	c5, c6, d1, d3, d5	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, a4, b1, b2, b3, d2
2	Assignments (1 + 2)	4-13 , 14	5	5	c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b2, b3,
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a1, a2, a3, a4, b1, b2, b3, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, b1, c1, c2, c3, c4, c6, d1, d3, d4, d5
2	Lab. Attitude	weekly	2.5	2.5	c6, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a1, a2, b2, c1, c2, c3, c4, c6, d1, d3, d4, d5
4	Lab. Reporting	weekly	2.5	2.5	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, b1
6	Practical exam (practical)	14	20	20	a1, a2, b2, c1, c2, c3, c4, c6, d1, d3, d4, d5



Total	40	40 %	
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## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. MesSchooley , introduction to botany, 1997, Delmar publisher

### 2- Essential References.

1. W.C. Evans, Trease and Evans pharmacognosy, 2009, W.B.Saunders
2. Stern. Introductory plant biology

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of BOTANY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

### II. Course Description:

The course provides essential knowledge and skills in plants as an introduction to pharmacognosy and phytochemistry courses.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A1	a1. Identify the general characters, life cycles and nutritional sources of the common orders, families, genera and species of the plant kingdom
2.		a2. Describe the types morphological and microscopical features of plant seeds, roots, leaves, stems , barks, flowers and fruits
3.		a3. Determine the structural/functional components and biological processes of plant cell and the anatomical and physiological features of tissues and systems in common plant species.
4.	A2	a4. Explicit the economic and medical uses of common plant genera and species in particular plants belonging to Angiosperm .
5.	B2	b1. Differentiate between various plant species based on their morphological and microscopical features.
6.		b2 . Classify plant kingdom into orders, families, genera and species.
7.		b3. Compare between animal cell and plant cell.
8.	C1	c1. Handle efficiently the tools and chemicals used in botany Lab.
9.		c2. Operate successfully the instruments used in botany Lab.
10.	C2	c3 . Perform effectively the experiments and practical tasks and including morphological & microscopical identification of plant species using standard procedures.
11.	C3	c4 .Take the required safety criteria during performing experiments in botany Lab.
12.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
13.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
14.	D1	d1. Share successfully in team-work.
15.	D2	d2. Show respect to life.
16.	D3	d3. Communicate effectively with his/her colleagues.
17.	D4	d4. Behave in discipline during practicing experiments in botany lab.
18.	D5	d5. Demonstrate time management and self-learning.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	laboratory practice , lecture	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam) , Written exam , Attendance
a3, a4	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture	Written exam , Attendance
b2, b3	Lecture, Feed-back learning	Written exam , Attendance quizzes
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	Feed-back learning , Group-project	Assignments
c6	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam) , Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice , Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) ,

		Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to botany</b>	a1, a3, a4,b1, b2,b3, d2	<ul style="list-style-type: none"> <li>• Definition and Brief history of botany</li> <li>• Basis of plant structures: plant cell and plant cellular contents , types of plant tissues and plant organs</li> <li>• Differences between plant kingdom and animal kingdom</li> <li>• Nutrition, metabolism and growth of plant</li> <li>• Plant taxonomy : basis of classification of plant kingdom into orders, families,, suborders, genera, species.</li> </ul>	2	4
2	<b>Plant Order (1) THALLOPHYTES( Thallophyta)</b>	a1, a3, a4,b1, b2, d2	<ul style="list-style-type: none"> <li>• General characters</li> <li>• <b>Algae</b>.g. Pleurococcus, Spirogyra, Vaucheria, Diatoms.), economic use of algae</li> <li>• <b>Fungi</b> : differences from algae, types phycomycetes (oomycetes e.g. saprolegnia), (zygomycetes e.g. black mold) eumycetes (ascomycetes e.g. yeasts: Ergot fungi ) (Basidiomycetes edible mushroom, amanita) economic use of fungi</li> <li>• <b>lichens</b> types and examples</li> <li>• <b>Bacteria</b> (only brief study on general characters and differences from fungi, algae and lichens.</li> <li>• <b>Viruses</b> : general characters, examples</li> </ul>	2	4
3	<b>Plant order (2) ARCHEGONIAT ES(Archegoniatae)</b>	a1, a3, a4,b1, b2, d2	<ul style="list-style-type: none"> <li>• General characters</li> <li>• Bryophytes e.g. Hepaticae, mosses</li> <li>• Pteridophytes e.g. Ferns, club mosses</li> </ul>	2	4
4	<b>Plant order (3) SPERMOPHYTES (seedling plants)</b>	a1, a3, a4,b1, b2, d2	<ul style="list-style-type: none"> <li>• Gymnosperms , characters, differences, examples of plants</li> <li>• Angiosperms: characters, differences, economically and medically valuable families.</li> </ul>	1	2
MID-TERM EXAM				1	2

5	<b>Plant parts in Angiosperms</b>	a1, a2, a3, a4, b1, b2, d2	(morphology, anatomy and physiology) of : <ul style="list-style-type: none"> <li>• The roots</li> <li>• The stems</li> <li>• The bark</li> <li>• The leaf</li> <li>• The flower</li> <li>• The fruit</li> <li>• The seed</li> </ul>	3	6
6	<b>classification of angiosperms yielding vegetable drugs.</b>	a1, a3, a4, b1, b2, d2	<ul style="list-style-type: none"> <li>• <b>Monocotyledons</b> : general characters, classification, examples of plants and their yielding drugs</li> <li>• <b>Dicotyledons</b> : (Archichlamydeae or Choripetalae, Metachlamydeas or Sympetalas): general characters, classification, examples of plants and their yielding drugs</li> </ul>	3	9
	<b>Course Review</b>	a1, a2, a3, a4, b1, b2, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CLOs
1.	introduction to pharmaceutical organic chemistry Lab.: safety requirements, list of experiments, How to report, etc.	1	2	a1, a2, c1, c2, c3, c4, c6, d1, d2, d3, d4, d5
2.	Algae: microscopical slides	1	2	a1, a2, c1, c2, c3, c4, c6, d1, d2, d3, d4, d5
3.	Fungi: microscopical and morphological features of different fungi species	2	4	a1, a2, c1, c2, c3, c4, c6, d1, d2, d3, d4, d5
4.	Plant leaves: morphology and microscopy	2	4	a1, a2, c1, c2, c3, c4, c6, d1, d2, d3, d4, d5
5.	Plant barks: morphology and microscopy	1	2	a1, a2, c1, c2, c3, c4, c6, d1, d2, d3, d4, d5
6.	Plant roots and rhizomes: morphology and microscopy	1	2	a1, a2, c1, c2, c3, c4, c6, d1, d2, d3, d4, d5
7.	Plant flowers: morphology and microscopy	1	2	a1, a2, c1, c2, c3, c4, c6, d1, d2, d3, d4, d5
8.	Plant fruits: morphology and microscopy	1	2	a1, a2, c1, c2, c3, c4, c6, d1, d2, d3, d4, d5
9.	Differentiation between Monocotyledons Dicotyledons : morphology and microscopy	1	2	a1, a2, c1, c2, c3, c4, c6, d1, d2, d3, d4, d5
PRACTICAL EXAM		1	2	a1, a2, b2, c1, c2, c3, c4, c6, d1, d3, d4, d5
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search report on one species of one medically valuable plant family.	c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to do a search report supported with illustrating videos on one of the followings : <ul style="list-style-type: none"> <li>• Plant taxonomy</li> <li>• Plant cell</li> <li>• Algae</li> <li>• phycomycetes</li> </ul>	c5, c6, d1, d3, d5	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, a4, b1, b2, b3, d2
2	Assignments (1 + 2)	4-13, 14	5	5	c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b2, b3,
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a1, a2, a3, a4, b1, b2, b3, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, b1, c1, c2, c3, c4, c6, d1, d3, d4, d5
2	Lab. Attitude	weekly	2.5	2.5	c6, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a1, a2, b2, c1, c2, c3, c4, c6, d1, d3, d4, d5
4	Lab. Reporting	weekly	2.5	2.5	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, b1
6	Practical exam (practical)	14	20	20	a1, a2, b2, c1, c2, c3, c4, c6, d1, d3, d4, d5
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. MesSchooley , introduction to botany, 1997, Delmar publisher

### 2- Essential References.

1. W.C. Evans, Trease and Evans pharmacognosy, 2009, W.B.Saunders
2. Stern. Introductory plant biology

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## X. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PHARMACEUTICAL ORGANIC CHEMISTRY

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	PHARMACEUTICAL ORGANIC CHEMISTRY					
2.	Course Code & Number:	PHRM 03					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		3	-	-	1		-
4.	Study level/ semester at which this course is offered:	( second ) Year – ( 1 <sup>st</sup> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General chemistry</li> <li>Organic chemistry</li> </ul>					
6.	Co –requisite (if any):	Nil					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course deals with the study of synthesis and reactions of drugs classified according to their organic chemical structures.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Describe the physicochemical properties and reactions of the common homocyclic and heterocyclic organic compounds from which drugs are synthesized.
2.	A3	a2. Discuss the principles, mechanisms and technologies applied in synthesis of drugs from organic compounds.
3.	A4	a3. Recognize his/her mission as pharmacist in chemical synthesis of drugs.
4.	B1	b1. Name and draw the structure a homocyclic and heterocyclic organic compound using IUPAC rules.
5.		b2. Interpret the similarities of drug activity based on similarities of their chemical structures.
6.	B2	b3. Solve chemical problems related to nomenclature, synthesis or reactions of drugs-related homocyclic and heterocyclic organic compounds.
7.		b4. Classify homocyclic and heterocyclic organic compounds.
8.	B3	b5. Develop a sequence of reactions to synthesize a drug chemically from a parent organic compound.
9.		b6. Predict the outcomes of a chemical reaction of homocyclic and heterocyclic organic compounds.
10.	B4	b7. Select the catalyst and assisting conditions required to complete the reactions of drug synthesis
11.	C1	c1. Handle efficiently the tools and chemicals used in pharmaceutical organic chemistry Lab.
12.		c2. Operate successfully the instruments used in pharmaceutical organic chemistry Lab.
13.	C2	c3. Perform efficiently experiments and practical tasks to synthesize and identify drugs chemically using standard procedures.
14.	C3	c4. Take the required safety criteria during performing different types of practical works in the pharmaceutical organic chemistry Lab.
15.	C4	c5. Use effectively symbols and figures and drawing to express chemical reactions and synthesis.
16.		c6. Appropriately search for information and also present and report

		his/her work using various source of information and media technologies.
17.	D1	d1. Share successfully in team-work.
18.	D3	d3. Communicate effectively with his/her colleagues in the pharmaceutical organic chemistry Lab.
19.	D4	d4. behave in discipline during practicing practical works in the pharmaceutical organic chemistry Lab.
20.	D5	d5. Demonstrate time management and self-learning during performing practical works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, laboratory practice	written exam , Practical assessment (Lab accomplishments, Lab. Reporting , practical exam)
a2	Lecture	written exam
a3	Lecture	written exam

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lab practice, feed-back learning	Written exam, practical assessment (lab. accomplishment, practical exam), assignments
b3 , b4	Lecture , , feed-back learning , , Group-project.	written exam , assignment , quiz
b5, b6	Lecture	written exam, quizzes
b7	Lecture , Laboratory practice	written exam , practical assessment ( Practical exam)

<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
c3	Lab. Practice	Practical assessment (Lab activity + practical exam )
c4	lab. practice	Practical assessment (Lab activity + practical exam )
c5, c6	lecture, feed-back learning	Written- exam , practical assessment (Lab. Reporting), assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1	Lab. Practice ,Group-project , , feed-back learning	Assignment , Practical assessment (Lab Reporting & Attitude).
d2	Lab. Practice ,Group-project, Filed-training	Practical assessment (Lab Attitude)
d3	Lab. Practice ,Group-project	Practical assessment (Lab Attitude)
d4	Lab. Practice , Group-project	Practical assessment (Lab Attitude)

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Monocyclic Alicyclic compounds</b>	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	1	3
2	<b>Benzyl and Benzhydryl derivatives</b>	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	1	3
3	<b>Phenethyl and Phenylpropylamines</b>	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	2	6
4	<b>Arylacetic and Arylpropionic Acids</b>	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	2	6
<b>MID-TERM EXAM</b>				1	2
5	<b>Arylethylenes compounds</b>	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	1	3
6	<b>Polycyclic Aromatic compounds</b>	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	2	6
7	<b>Steroids</b>	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	1	6
8	<b>Heterocyclic compounds: 5, 6, 7 – membered fused to</b>	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	3	9



	<b>one ring and two rings</b>				
<b>Course Review</b>	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5	Review of the course topics by discussion session.	1	3	
FINAL - EXAM			1	3	
<b>TOTAL</b>			16	47	
<b>Number of Weeks /and Units Per Semester</b>			16 weeks	8 Units	

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CIOs
1.	introduction to pharmaceutical organic chemistry Lab.: safety requirements, list of experiments, How to report, etc.	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
<b>General physicochemical properties of the chemical group.</b>				
<b>experiments of Chemical identification and synthesis of one-two drugs belonging to the following groups</b>				
2.	Monocyclic Alicyclic compounds : Hyosine	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
3.	Benzyl and Benzhydryl derivatives : Orphenadine	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
4.	Phenethyl and Phenylpropylamines: adrenaline	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
5.	Phenethyl and Phenylpropylamines: methyl dopa			
6.	Arylacetic and Arylpropionic Acids : Thyroxin	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
7.	Polycyclic Aromatic compounds : Tetracycline	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
8.	Heterocyclic compounds:: Mebendazole	1	6	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
9.	Heterocyclic compounds:: indomethacin	1		
10.	Heterocyclic compounds:: aminophyllin	1		
11.	Heterocyclic compounds:: ascorbic acid	1		
<b>PRACTICAL EXAM</b>		1	2	a1, a2, b2, b3, b6, c1, c2, c3, c4, c5, d1, d2, d3, d4
<b>Total</b>		12	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with chemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b3, c5, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to do a search-report supported by illustrating figures for all drugs belonging to one of the studied homocyclic/hetrocyclic organic compounds.	d1, c6	14	2

## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5
2	Assignments (1 + 2)	4-13, 14	5	5	b3, c5, c6, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3 , b4, b5, b6
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5
TOTAL			60	60 %	60

### Practicalpartassessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
2	Lab. Attitude	weekly	2.5	2.5	d2, d3, d4
3	Lab. Accomplishments	weekly	5	5	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
4	Lab. Reporting	weekly	2.5	2.5	a1, c4, d1
5	Exam of practice theory (written exam or oral exam)	14	5	5	c6
6	Practical exam (practical)	14	20	20	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Daniel Ledincer : Organic chemistry of drug synthesis, John Wiley & Sons

### 2- Essential References.

1. Saraf. The chemistry of heterocyclic compounds
2. Anil. A text book of pharmaceutical organic chemistry
3. British pharmacopeia BP, 2013
4. United states pharmacopeia USP, 31
5. Ali. A text book of pharmaceutical organic chemistry

### 3- Electronic Materials and Web Sites etc.

- [www.en.wikipedia.org/](http://www.en.wikipedia.org/)
- [www.usp.org](http://www.usp.org)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of

### Pharmaceutical organic chemistry

I. Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with the study of synthesis and reactions of drugs classified according to their organic chemical structures.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Describe the physicochemical properties and reactions of the common homocyclic and heterocyclic organic compounds from which drugs are synthesized.
2.	A3	a2. Discuss the principles, mechanisms and technologies applied in synthesis of drugs from organic compounds.
3.	A4	a3. Recognize his/her mission as pharmacist in chemical synthesis of drugs.
4.	B1	b1. Name and draw the structure a homocyclic and heterocyclic organic compound using IUPAC rules.
5.		b2. Interpret the similarities of drug activity based on similarities of their chemical structures.
6.	B2	b3. Solve chemical problems related to nomenclature, synthesis or reactions of drugs-related homocyclic and heterocyclic organic compounds.
7.		b4. Classify homocyclic and heterocyclic organic compounds.
8.	B3	b5. Develop a sequence of reactions to synthesize a drug chemically from a parent organic compound.
9.		b6. Predict the outcomes of a chemical reaction of homocyclic and heterocyclic organic compounds.
10.	B4	b7. Select the catalyst and assisting conditions required to complete the reactions of drug synthesis
11.	C1	c1. Handle efficiently the tools and chemicals used in pharmaceutical organic chemistry Lab.
12.		c2. Operate successfully the instruments used in pharmaceutical organic chemistry Lab.
13.	C2	c3. Perform efficiently experiments and practical tasks to synthesize and identify drugs chemically using standard procedures.
14.	C3	c4. Take the required safety criteria during performing different types of practical works in the pharmaceutical organic chemistry Lab.
15.	C4	c5. Use effectively symbols and figures and drawing to express chemical reactions and synthesis.
16.		c6. Appropriately search for information and also present and report

		his/her work using various source of information and media technologies.
17.	D1	d1. Share successfully in team-work.
18.	D3	d3. Communicate effectively with his/her colleagues in the pharmaceutical organic chemistry Lab.
19.	D4	d4. behave in discipline during practicing practical works in the pharmaceutical organic chemistry Lab.
20.	D5	d5. Demonstrate time management and self-learning during performing practical works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, laboratory practice	written exam , Practical assessment (Lab accomplishments, Lab. Reporting , practical exam)
a2	Lecture	written exam
a3	Lecture	written exam

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lab practice , feed-back learning	Written exam, practical assessment (lab. accomplishment, practical exam), assignments
b3 , b4	Lecture, , feed-back learning, , Group-project.	written exam , assignment , quiz
b5, b6	Lecture	written exam, quizzes
b7	Lecture , Laboratory practice	written exam , practical assessment ( Practical exam)



<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
c3	Lab. Practice	Practical assessment (Lab activity + practical exam )
c4	lab. practice	Practical assessment (Lab activity + practical exam )
c5, c6	lecture, feed-back learning	Written- exam , practical assessment (Lab. Reporting), assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1	Lab. Practice ,Group-project , , feed-back learning	Assignment , Practical assessment (Lab Reporting & Attitude).
d2	Lab. Practice ,Group-project, Filed-training	Practical assessment (Lab Attitude)
d3	Lab. Practice ,Group-project	Practical assessment (Lab Attitude)
d4	Lab. Practice , Group-project	Practical assessment (Lab Attitude)

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Monocyclic Alicyclic compounds</b>	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	1	3
2	<b>Benzyl and Benzhydryl derivatives</b>	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	1	3
3	<b>Phenethyl and Phenylpropylamines</b>	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	2	6
4	<b>Arylacetic and Arylpropionic Acids</b>	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	2	6
<b>MID-TERM EXAM</b>				1	2
5	<b>Arylethylenes compounds</b>	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	1	3
6	<b>Polycyclic Aromatic compounds</b>	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	2	6
7	<b>Steroids</b>	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	1	6

8	<b>Heterocyclic compounds: 5, 6, 7 – membered fused to one ring and two rings</b>	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	3	9
	<b>Course Review</b>	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5	Review of the course topics by discussion session.	1	3
FINAL - EXAM				1	3
<b>TOTAL</b>				16	47
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	8 Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CIOs
1.	Introduction to pharmaceutical organic chemistry Lab.: safety requirements, list of experiments, How to report, etc.	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
<b>General physicochemical properties of the chemical group. experiments of Chemical identification and synthesis of one-two drugs belonging to the following groups</b>				
2.	Monocyclic Alicyclic compounds : Hyoscine	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
3.	Benzyl and Benzhydryl derivatives : Orphenadine	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
4.	Phenethyl and Phenylpropylamines: adrenaline	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
5.	Phenethyl and Phenylpropylamines: methyldopa			a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
6.	Arylacetic and Arylpropionic Acids : Thyroxin	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
7.	Polycyclic Aromatic compounds : Tetracycline	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
8.	Heterocyclic compounds:: Amikcin	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
9.	Heterocyclic compounds:: indomethacin	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
10.	Heterocyclic compounds:: aminophyllin	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
11.	Heterocyclic compounds:: ascorbic acid	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
PRACTICAL EXAM		1	2	a1, a2, b2, b3, b6, c1, c2, c3, c4, c5, d1, d2, d3, d4
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.          The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with chemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b3, c5, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to do a search-report supported by illustrating figures for all drugs belonging to one of the studied homocyclic/hetrocyclic organic compounds.	d1, c6	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5
2	Assignments (1 + 2)	4-13, 14	5	5	b3, c5, c6, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3 , b4, b5, b6
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
2	Lab. Attitude	weekly	2	2	d2, d3, d4
3	Lab. Accomplishments	weekly	5	5	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
4	Lab. Reporting	weekly	3	3	a1, c4, d1
5	Exam of practice theory (written exam or oral exam)	14	5	5	c6
6	Practical exam (practical)	14	20	20	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Daniel Ledincer : Organic chemistry of drug synthesis, John Wiley & Sons

### 2- Essential References.

1. Saraf. The chemistry of heterocyclic compounds
2. Anil. A text book of pharmaceutical organic chemistry
3. British pharmacopeia BP, 2013
4. United states pharmacopeia USP, 31
5. Ali. A text book of pharmaceutical organic chemistry

### 3- Electronic Materials and Web Sites etc.

- [www.en.wikipedia.org/](http://www.en.wikipedia.org/)
- [www.usp.org](http://www.usp.org)

## X. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PHYSICAL PHARMACY

<b>I. Course Identification and General Information:</b>					
1.	Course Title:	PHYSICAL PHARMACY			
2.	Course Code & Number:	PHRT 02			
3.	Credit hours:	C.H			TOTAL
		Theoretical			
		L.	Tut.	S.	
		1	1	-	
			P.	Tr.	
			1	-	3
4.	Study level/ semester at which this course is offered:	( SECOND ) Year – ( 1 <sup>ST</sup> ) semester			
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>Introduction to pharmacy profession</li> <li>Physics</li> </ul>			
6.	Co –requisite (if any):				
7.	Program (s) in which the course is offered:	All BC programs offered by the university			
8.	Language of teaching the course:	ENGLISH			
9.	Location of teaching the course:	IN THE UNIVERSITY			
10	Prepared By:				
11	Date of Approval	<b>10/2014</b>			

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### I. Course Description:

This course deals with study of the various physical phenomena applied or observed in pharmacy in particular pharmaceutical dosage forms design and formulation. Therefore, this course can be referred so as to introduction to "pharmaceutics" courses.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explicit the physical properties that exist between molecules of the same matter and those existing as interaction between two or more matters.
2.	A3	a2. Discuss certain physical phenomena that are applied or frequently observed in pharmacy practice.
3.	A4	a3. Recognize the role of pharmacist in applying the rules of physics in pharmacy practice.
4.	B1	b1. Solve mathematical problems related to physical pharmacy.
5.	B2	b2. Relate physical phenomena to their affecting factors.
6.	B3	b3. Interpret scientifically the sequence and outcomes of certain physical phenomena related to pharmacy practice. Formulate /develop
7.	B4	b4. Assess the pharmaceutical applications of various physical phenomena.
8.	C1	c1. Handle efficiently the tools and chemicals used in physical pharmacy Lab.
9.		c2. Operate successfully the instruments used in physical pharmacy Lab.
10.	C2	c3. Perform effectively the experiments for determination of certain physical parameters in physical pharmacy Lab.
11.	C3	c4. Take the required safety criteria during performing experiments in physical pharmacy Lab.
12.	C4	c5. Use efficiently different types of information sources to search and report certain search assignments related to the studied topics.
13.	D1	d1. Share successfully in a team-work.
14.	D3	d2. Communicate effectively with his/her colleagues during performing experiments in physical pharmacy Lab.
15.	D4	d3. Behave in discipline during performing experiments in physical pharmacy Lab.
16.	D5	d4. Demonstrate time management during performing experiments in physical pharmacy Lab and show self-learning by making individual assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, Lecture-discussion , feed-back learning	written exam
a2	Lecture, Lecture-discussion,, feed-back learning	written exam
a3	Lecture, Lecture-discussion, Laboratory practice	written exam, practical assessment

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lab practice ,Feed-back learning , feed-back learning.	Written exam, practical assessment (lab. accomplishment, practical exam), assignments
b2	Lecture, Lecture-discussion , feed-back learning	written exam , quizzes
b3	Lecture, Lecture-discussion, feed-back learning	written exam, quizzes
b4	Lecture , Laboratory practice	written exam , practical assessment ( Practical exam )

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )

<b>c3</b>	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
<b>c4</b>	Lab. Practice	Practical assessment (Lab activity + practical exam )
<b>c5</b>	Feed-back learning ,Group-project.	Written- exam , practical assessment (Lab. Reporting),assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1</b>	Lab. Practice ,Group-project , , feed-back learning	Assignment , Practical assessment (Lab Reporting & Attitude) , assignment
<b>d2.</b>	Lab. Practice ,Group-project,	Practical assessment (Lab Attitude)
<b>d3</b>	Lab. Practice	Practical assessment (Lab Attitude)
<b>d4</b>	Lab. Practice, feed-back learning	Practical assessment (Lab Attitude) ,assignment

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to physical pharmacy</b>	a1, a2, a3, b2	<ul style="list-style-type: none"> <li>• Scope and purposes of physical pharmacy</li> <li>• State of matters : factors affecting ( intermolecular forces, vapor pressure, atmospheric pressure, thermal energy)</li> <li>• Circle of interconversion of a matter from a state of state ; name of processes, factors affecting</li> <li>• Pharmaceutical Application of interconversion of matters in pharmacy</li> </ul>	2	4
2	<b>solid state physical properties</b>	a1, a2, a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>• Melting points of solids</li> <li>• Liquification of mixed solids</li> <li>• Crystallization : principles and applications</li> <li>• Amorphous and crystalline forms</li> <li>• Polymorphism, hydrates, anhydrous</li> <li>• Micrometrics : particle size definition, analysis</li> <li>• Tapped and bulk density</li> <li>• porosity, flowability and Carr`s index</li> <li>• Mathematical problems related to the studied topics</li> <li>• summary of Pharmaceutical Applications of solid state properties.</li> </ul>	3	6
	<b>liquid states physical properties</b>	a1, a2, a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>• evaporation, boiling, vaporization and volatilization</li> <li>• Viscosity and types of flow of fluids</li> <li>• Mathematical problems related to the studied topics</li> <li>• Pharmaceutical Applications of</li> </ul>	2	4

			liquid state properties.		
<b>MID-TERM EXAM</b>				1	2
4	<b>Gas state physical properties</b>	a1, a2, a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>• Ideal gases and Real gases</li> <li>• Laws and equations of ideal and real gases</li> <li>• Aerosols :principles and applications</li> </ul>	1	2
5	<b>Physical interactions between matters</b>	a1, a2, a3, b1, b2, b3, b4	<p>Principles, equations, factors and problems of the following physical matters interactions:</p> <ul style="list-style-type: none"> <li>• solubility , miscibility and dissolution</li> <li>• insolubility and immiscibility</li> <li>• dispersion and surface tensions (Solid dispersion in liquids , Liquid dispersion in liquids)</li> <li>• Sedimentation</li> <li>• Colaescences</li> <li>• partition coefficient: hydrophilicity and lipophilicity</li> <li>• Adsorption</li> <li>• Complexation</li> <li>• Mathematical problems related to the studied topics</li> <li>• Summary of pharmaceutical applications of the</li> </ul>	3	6
6	<b>Stability and degradation kinetics</b>	a1, a2, a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>• Degradation of matters : definition and types of degradation, definition of stability, factors enhancing degradation, approaches to reduce or limit degradation</li> <li>• Orders of degradarion (zero,first, second)</li> <li>• Degradation parameters: degradation rate constant, half-life(<math>t_{1/2}</math>) , shelf life (<math>t_{90}</math>)</li> <li>• Mathematical problems related to degradation order kinetics</li> </ul>	3	6

<b>Course Review</b>	a1, a2, a3, b1, b2, b3, b4	Review of the course topics by discussion session.	1	2
FINAL - EXAM			1	2
<b>TOTAL</b>			16	32
<b>Number of Weeks /and Units Per Semester</b>			16 weeks	6 Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	AlignedCourse Intended Learning Outcomes CILOs
1.	<b>introduction to Lab.:</b> safety requirements, list of experiments, How to report, etc + liquefaction of solids	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
2.	Crystallization phenomena	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
3.	Tapped and bulk density porosity and Carr`s index of flowabilit description ..	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
4.	Density of l iquids	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
5.	Viscosity determination	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
6.	Particle size determination (sedimentation method)	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
7.	Surface tension determination (Drop weight method)	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
8.	Solubility descption	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
9.	Adsorption phenomenon	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
10.	Partitition coefficient determination	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
11.	Review	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**lecture - Discussion**: a short lecture/ address followed by discussion

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, home-works, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with mathematical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b1, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to make a search-report supported by illustrating videos on one of the studied physical phenomenon.	c5, d1	14	2



VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b1, b2, b3, b4
2	Assignments (1 + 2)	4-13 , 14	5	5	b1, c5, d1, d5
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b1, b3
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, b1, b2, b3, b4
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b1, b2, b3, b4
TOTAL			60	60 %	60

Practicalpart assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	c1, c2, c3, c4, d1, d2, d3, d4,d5
2	Lab. Attitude	weekly	2.5	2.5	d1, d2, d3, d4
3	Lab. Accomplishments	weekly	5	5	c1, c2
4	Lab. Reporting	weekly	2.5	2.5	c5, d1
5	Exam of practice theory (written exam or oral exam)	14	5	5	c1, c2, c3, c4, d1, d2, d3, d4,d5
6	Practical exam (practical)	14	20	20	c1, c2, c3, c4, d1, d2, d3, d4,d5
Total			40	40 %	

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Martin`s : Physical pharmacy and pharmaceutical sciences, 2011, Lippincott Williams & Wilkins, UK
<b>2- Essential References.</b>
1. Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone, UK 2. Subrahmanyam. A text book of physical pharmaceutics, 2015, VallabhPrakashan, India 3. R.S. Gaud G.T. Gupta practical physical pharmacy, 2012, CBS, USA
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of PHYSICAL PHARMACY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
<p>This course deals with study of the various physical phenomena applied or observed in pharmacy in particular pharmaceutical dosage forms design and formulation. Therefore, this course can be referred so as to introduction to "pharmaceutics" courses.</p>

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A2	a1. Explicit the physical properties that exist between molecules of the same matter and those existing as interaction between two or more matters.
2.	A3	a2. Discuss certain physical phenomena that are applied or frequently observed in pharmacy practice.
3.	A4	a3. Recognize the role of pharmacist in applying the rules of physics in pharmacy practice.
4.	B1	b1. Solve mathematical problems related to physical pharmacy.
5.	B2	b2. Relate physical phenomena to their affecting factors.
6.	B3	b3. Interpret scientifically the sequence and outcomes of certain physical phenomena related to pharmacy practice. Formulate /develop
7.	B4	b4. Assess the pharmaceutical applications of various physical phenomena.
8.	C1	c1. Handle efficiently the tools and chemicals used in physical pharmacy Lab.
9.		c2. Operate successfully the instruments used in physical pharmacy Lab.
10.	C2	c3. Perform effectively the experiments for determination of certain physical parameters in physical pharmacy Lab.
11.	C3	c4. Take the required safety criteria during performing experiments in physical pharmacy Lab.
12.	C4	c5. Use efficiently different types of information sources to search and report certain search assignments related to the studied topics.
13.	D1	d1. Share successfully in a team-work.
14.	D3	d2. Communicate effectively with his/her colleagues during performing experiments in physical pharmacy Lab.
15.	D4	d3. Behave in discipline during performing experiments in physical pharmacy Lab.
16.	D5	d4. Demonstrate time management during performing experiments in physical pharmacy Lab and show self-learning by making individual assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, Lecture-discussion , feed-back learning	written exam
a2	Lecture, Lecture-discussion,, feed-back learning	written exam
a3	Lecture, Lecture-discussion, Laboratory practice	written exam , practical assessment

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lab practice ,Feed-back learning , feed-back learning.	Written exam, practical assessment (lab. accomplishment, practical exam), assignments
b2	Lecture, Lecture-discussion , feed-back learning	written exam , quizzes
b3	Lecture, Lecture-discussion, feed-back learning	written exam, quizzes
b4	Lecture , Laboratory practice	written exam , practical assessment ( Practical exam)

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment (Lab accomplishments + practical

		exam )
c3	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
c4	Lab. Practice	Practical assessment (Lab activity + practical exam )
c5	Feed-back learning ,Group-project.	Written- exam , practical assessment (Lab. Reporting),assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1	Lab. Practice ,Group-project , , feed-back learning	Assignment , Practical assessment (Lab Reporting & Attitude) , assignment
d2.	Lab. Practice ,Group-project,	Practical assessment (Lab Attitude)
d3	Lab. Practice	Practical assessment (Lab Attitude)
d4	Lab. Practice, feed-back learning	Practical assessment (Lab Attitude) ,assignment

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to physical pharmacy</b>	a1, a2, a3, b2	<ul style="list-style-type: none"> <li>• Scope and purposes of physical pharmacy</li> <li>• State of matters : factors affecting ( intermolecular forces, vapor pressure, atmospheric pressure, thermal energy)</li> <li>• Circle of interconversion of a matter from a state of state ; name of processes, factors affecting</li> <li>• Pharmaceutical Application of interconversion of matters in pharmacy</li> </ul>	2	4
2	<b>solid state physical properties</b>	a1, a2, a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>• Melting points of solids</li> <li>• Liquifiction of mixed solids</li> <li>• Crystallization : principles and applications</li> <li>• Amorphous and crystalline forms</li> <li>• Polymorphism, hydrates, anhydrous</li> <li>• Micrometrics : particle size definition, analysis</li> <li>• Tapped and bulk density</li> <li>• porosity, flowability and Carr`s index</li> <li>• Mathematical problems related to the studied topics</li> <li>• summary of Pharmaceutical Applications of solid state properties.</li> </ul>	3	6
	<b>liquid states physical properties</b>	a1, a2, a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>• evaporation, boiling, vaporization and volatilization</li> <li>• Viscosity and types of flow of fluids</li> <li>• Mathematical problems related to the studied topics</li> <li>• Pharmaceutical Applications of liquid state properties.</li> </ul>	2	4

MID-TERM EXAM				1	2
4	<b>Gas state physical properties</b>	a1, a2, a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>• Ideal gases and Real gases</li> <li>• Laws and equations of ideal and real gases</li> <li>• Aerosols :principles and applications</li> </ul>	1	2
5	<b>Physical interactions between matters</b>	a1, a2, a3, b1, b2, b3, b4	<p>Principles, equations, factors and problems of the following physical matters interactions:</p> <ul style="list-style-type: none"> <li>• solubility , miscibility and dissolution</li> <li>• insolubility and immiscibility</li> <li>• dispersion and surface tensions (Solid dispersion in liquids , Liquid dispersion in liquids)</li> <li>• Sedimentation</li> <li>• Colaescences</li> <li>• partition coefficient: hydrophilicity and lipophilicity</li> <li>• Adsorption</li> <li>• Complexation</li> <li>• Mathematical problems related to the studied topics</li> <li>• Summary of pharmaceutical applications of the</li> </ul>	3	6
6	<b>Stability and degradation kinetics</b>	a1, a2, a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>• Degradation of matters : definition and types of degradation, definition of stability, factors enhancing degradation, approaches to reduce or limit degradation</li> <li>• Orders of degradarion (zero,first, second)</li> <li>• Degradation parameters: degradation rate constant, half-life(<math>t_{1/2}</math>) , shelf life (<math>t_{90}</math>)</li> <li>• Mathematical problems related to degradation order kinetics</li> </ul>	3	6
<b>Course Review</b>		a1, a2, a3, b1, b2, b3, b4	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2



<b>TOTAL</b>	16	32
<b>Number of Weeks /and Units Per Semester</b>	16 weeks	6 Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CLOs
1.	introduction to Lab.: safety requirements, list of experiments, How to report, etc + liquefaction of solids	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
2.	Crystallization phenomena	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
3.	Tapped and bulk density porosity and Carr`s index of flowabilit description .	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
4.	Density of l iquids	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
5.	Viscosity determination	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
6.	Particle size determination (sedimentation method)	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
7.	Solubility description	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
8.	Surface tension determination (Drop weight method)	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
9.	Adsorption phenomenon	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
10.	Partition coefficient determination	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
11.	Review	1	2	c1, c2, c3, c4, d1, d2, d3, d4,d5
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**lecture - Discussion**: a short lecture/ address followed by discussion

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, home-works, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with mathematical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b1, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to make a search-report supported by illustrating videos on one of the studied physical phenomenon.	c5, d1	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b1, b2, b3, b4
2	Assignments (1 + 2)	4-13 , 14	5	5	b1, c5, d1, d5
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b1, b3
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a1, a2, a3, b1, b2, b3, b4
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b1, b2, b3, b4
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	c1, c2, c3, c4, d1, d2, d3, d4,d5
2	Lab. Attitude	weekly	2.5	2.5	d1, d2, d3, d4
3	Lab. Accomplishments	weekly	5	5	c1, c2
4	Lab. Reporting	weekly	2.5	2.5	c5, d1
5	Exam of practice theory (written exam or oral exam)	14	5	5	c1, c2, c3, c4, d1, d2, d3, d4,d5
6	Practical exam (practical)	14	20	20	c1, c2, c3, c4, d1, d2, d3, d4,d5
Total			40	40 %	

## IX. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
2. Martin`s : Physical pharmacy and pharmaceutical sciences, 2011, Lippincott Williams & Wilkins, UK
<b>2- Essential References.</b>
4. Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone, UK
5. Subrahmanyam. A text book of physical pharmaceutics, 2015, VallabhPrakashan, India
6. R.S. Gaud G.T. Gupta practical physical pharmacy, 2012, CBS, USA
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PHARMACEUTICAL CALCULATIONS SKILLS

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	PHARMACEUTICAL CALCULATIONS SKILLS					
2.	Course Code & Number:	PHRT 03					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		1	1	-	-		-
4.	Study level/ semester at which this course is offered:	( SECOND ) Year – ( FIRST ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>Introduction to pharmacy profession</li> <li>Mathematics</li> </ul>					
6.	Co –requisite (if any):	None					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with study of essential mathematical calculations related to drug formulation, dispensing and dosing.

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A4	a1. Comprehend his/her role as pharmacist in performing correct calculations and measuring to perform pharmaceutical tasks e.g. drug product preparation and dispensing and dosaging
2.	B1	b1. Express drug strength in various expressions and use Arabic and Roman numerals to express numbers.
3.		b2. Interpret symbols and abbreviations in medical prescriptions.
4.	B2	b3. Solve mathematical problems related to drug product preparation and dispensing.
5.		b4. Enlarge and reduce the ingredients quantity in a pharmaceutical
6.		b5. Calculate the isotonicity and buffer capacity in pharmaceutical solutions.
7.		b6. Calculate child doses based on standard rules.
8.	B4	b7 . Assess the correction of his/her calculations mathematically.
9.	C1	c1. Effectively and accurately use scientific calculator to perform pharmaceutical calculations related to preparation, dispensing and dosing of drug products..
10.	C4	c2. Present and report his/her workscorrectly using appropriate writing rules and technologies media.
11.	D1	d1. Share successfully in team-work.
12.	D4	d2. Comply to pharmacy rules and laws.
13.	D5	d3. Demonstrate time management and self-learning

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	lecture, Lecture-discussion	Written exam , Attendance
b3, b4, b5, b6	lecture, Lecture-discussion , Feed-back learning, group project	Written exam , Attendance, assignments, quizzes
b7	lecture, Lecture-discussion	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	Lecture-discussion, Feed-back learning	written exam, assignments
c2	Feed-back learning, group project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2	Feed-back learning, group project	Assignments
d3	Feed-back learning, group project	Assignments

#### IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, b3, b7, c1	basic mathematical processing, calculators , source of errors, Roman and Arabic Numerals	1	2
2	<b>Pharmaceutical measurement systems of weightss</b>	a1, b3, b7, c1	: <ul style="list-style-type: none"> <li>• Apothecary and avoidd. systems</li> <li>• metric system.</li> <li>• Equivalent weight and milliequivalent weight</li> </ul>	2	4
3	<b>Pharmaceutical measurement systems of volumes</b>	a1, b3, b7, c1	<ul style="list-style-type: none"> <li>• Apothecary</li> <li>• Metric system</li> <li>• house-hold systems</li> </ul>	2	4
4	<b>Expressions of concentrations</b>	a1, b3, b7, c1	percentage, ratio, quantity/quantity, PPM, PPB, molarity, milliequivalent	1	2
5	<b>Dilution&amp;Alliga tion</b>	a1, b3, b7, c1	<ul style="list-style-type: none"> <li>• Dilution of conc. Solutions</li> <li>• dilution of potent solids</li> </ul>	1	2
<b>MID-TERM EXAM</b>				1	2
6	<b>Isotonicity</b>	a1, b3, b5, b7, c1	<ul style="list-style-type: none"> <li>• definition &amp; significance</li> <li>• determination</li> </ul>	1	2
7	<b>Buffer capacity</b>	a1, b3, b5, b7, c1	<ul style="list-style-type: none"> <li>• definition &amp; significance</li> <li>• determination</li> </ul>	1	2
8	<b>Medical prescriptions</b>	a1, b2, b3, b7, c1	<ul style="list-style-type: none"> <li>• ideal prescription,components of the prescriptions</li> <li>• common symbols and abbreviations</li> </ul>	2	4
9	<b>Enlarging and reducing prescription</b>	a1, b3,b4 b7, c1	<ul style="list-style-type: none"> <li>• definition</li> <li>• determination</li> </ul>	1	2



	formulas				
10	<b>Pediatric Dose</b>	a1, b3, b7, c1	<ul style="list-style-type: none"> <li>• definitions of doses</li> <li>• Expression of doses</li> <li>• Rules for calculation the child's dose based on age, weight and body surface area</li> </ul>	2	4
<b>Course Review</b>		a1, b3, b6, b7, c1	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	10 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**lecture - Discussion**: a short lecture/ address followed by discussion

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> the teacher provide the students with mathematical problems after each unit. Every student is assigned to solve some of those problems individually.	b3, b4, b5, b6, c2, d1, d3	4-13	6
2	<b>Group :</b> each group of students will be assigned to present a report of typical answers of problems of one unit with assessing the correction of answers.	b3, c2, d1, d2, d3	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, b1, b2, b3, b4, b5, b6, b7
2	Assignments (1 + 2)	4-13, 14	10	10	b3, b4, b5, b6, c2, d1, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b3, b4, b5, b6
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, b3, b7, c1
5	Final exam of theoretical part ( written exam)	17	60	60	1, b1, b2, b3, b4, b5, b6, b7
TOTAL			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Howard C. Ansel, Pharmaceutical Calculations, 2010, Lippincott Williams & Wilkins .
<b>2- Essential References.</b>
1. Winfield. calculations for pharmaceutical practice 2. Ryan F Donnelly, Johanne Barry, MCQs in Pharmaceutical Calculations, 2009, pharmaceutical press
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of

### Pharmaceutical calculations skills

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

### II. Course Description:

The course deals with study of essential mathematical calculations related to drug formulation, preparation, dispensing and dosing.

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
3. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A4	a1. Comprehend his/her role as pharmacist in performing correct calculations and measuring to perform pharmaceutical tasks e.g. drug product preparation and dispensing and dosaging
2.	B1	b1. Express drug strength in various expressions and use Arabic and Roman numerals to express numbers.
3.		b2. Interpret symbols and abbreviations in medical prescriptions.
4.	B2	b3. Solve mathematical problems related to drug product preparation and dispensing.
5.		b4. Enlarge and reduce the ingredients quantity in a pharmaceutical
6.		b5. Calculate the isotonicity and buffer capacity in pharmaceutical solutions.
7.		b6. Calculate child doses based on standard rules.
8.	B4	b7 . Assess the correction of his/her calculations mathematically.
9.	C1	c1. Effectively and accurately use scientific calculator to perform pharmaceutical calculations related to preparation, dispensing and dosing of drug products..
10.	C4	c2. Present and report his/her workscorrectly using appropriate writing rules and technologies media.
11.	D1	d1. Share successfully in team-work.
12.	D4	d2. Comply to pharmacy rules and laws.
13.	D5	d3. Demonstrate time management and self-learning

<b>4. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	lecture, Lecture-discussion	Written exam , Attendance
b3, b4, b5, b6	lecture, Lecture-discussion , Feed-back learning, group project	Written exam , Attendance, assignments, quizzes
b7	lecture, Lecture-discussion	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	Lecture-discussion, Feed-back learning	written exam, assignments
c2	Feed-back learning, group project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2	Feed-back learning, group project	Assignments
d3	Feed-back learning, group project	Assignments

IV. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, b3, b7, c1	basic mathematical processing, calculators , source of errors, Roman and Arabic Numerals	1	2
2	<b>Pharmaceutical measurement systems of weightss</b>	a1, b3, b7, c1	: <ul style="list-style-type: none"> <li>• Apothecary and avoird. systems</li> <li>• metric system.</li> <li>• Equivalent weight and milliequivalent weight</li> </ul>	2	4
3	<b>Pharmaceutical measurement systems of volumes</b>	a1, b3, b7, c1	<ul style="list-style-type: none"> <li>• Apothecary</li> <li>• Metric system</li> <li>• house-hold systems</li> </ul>	2	4
4	<b>Expressions of concentrations</b>	a1, b3, b7, c1	percentage, ratio, quantity/quantity, PPM, PPB, molarity, milliequivalent	1	2
5	<b>Dilution&amp;Alliga tion</b>	a1, b3, b7, c1	<ul style="list-style-type: none"> <li>• Dilution of conc. Solutions</li> <li>• dilution of potent solids</li> </ul>	1	2
<b>MID-TERM EXAM</b>				1	2
6	<b>Isotonicity</b>	a1, b3, b5, b7, c1	<ul style="list-style-type: none"> <li>• definition &amp; significance</li> <li>• determination</li> </ul>	1	2
7	<b>Buffer capacity</b>	a1, b3, b5, b7, c1	<ul style="list-style-type: none"> <li>• definition &amp; significance</li> <li>• determination</li> </ul>	1	2
8	<b>Medical prescriptions</b>	a1, b2, b3, b7, c1	<ul style="list-style-type: none"> <li>• ideal prescription,components of the prescriptions</li> </ul>	2	4

			<ul style="list-style-type: none"> <li>• common symbols and abbreviations</li> </ul>		
9	<b>Enlarging and reducing prescription formulas</b>	a1, b3,b4 b7, c1	<ul style="list-style-type: none"> <li>• definition</li> <li>• determination</li> </ul>	1	2
10	<b>Pediatric Dose</b>	a1, b3, b7, c1	<ul style="list-style-type: none"> <li>• definitions of doses</li> <li>• Expression of doses</li> <li>• Rules for calculation the child`s dose based on age, weight and body surface area</li> </ul>	2	4
<b>Course Review</b>		a1, b3, b6, b7, c1	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	10 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student`s brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**lecture - Discussion**: a short lecture/ address followed by discussion

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills



VI. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> the teacher provide the students with mathematical problems after each unit. Every student is assigned to solve some of those problems individually.	b3, b4, b5, b6, c2, d1, d3	4-13	6
2	<b>Group :</b> each group of students will be assigned to present a report of typical answers of problems of one unit with assessing the correction of answers.	b3, c2, d1, d2, d3	14	4

VII. Schedule of Assessment Tasks for Students During the Semester					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, b1, b2, b3, b4, b5, b6, b7
2	Assignments (1 + 2)	4-13, 14	10	10	b3, b4, b5, b6, c2, d1, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b3, b4, b5, b6
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, b3, b7, c1
5	Final exam of theoretical part ( written exam)	17	60	60	1, b1, b2, b3, b4, b5, b6, b7
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Howard C. Ansel,, Pharmaceutical Calculations, 2010, Lippincott Williams & Wilkins .

### 2- Essential References.

1. Winfield. calculations for pharmaceutical practice
2. Ryan F Donnelly, Johanne Barry, MCQs in Pharmaceutical Calculations, 2009, pharmaceutical press

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## X. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification" PATHOLOGY"

I. Course Identification and General Information:						
1.	Course Title:	PATHOLOGY				
2.	Course Code &Number:	MSC 10				
3.	Credit hours:	C.H			TOTAL	
		Theoretical		P.		Tr.
		L.	Tut.	S.		
		2	-	-	-	2
4.	Study level/ semester at which this course is offered:	( SECOND) Year –( 2 <sup>ND</sup> ) semester				
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>• General biology</li> <li>• Anatomy &amp; histology</li> <li>• Physiology I</li> </ul>				
6.	Co –requisite (if any):	NONE				
7.	Program (s) in which the course is offered:	All BC programs offered by the university				
8.	Language of teaching the course:	ENGLISH				
9.	Location of teaching the course:	IN THE UNIVERSITY				
10	Prepared By:					
11	Date of Approval	10/2014				

. Course Description:	
The course provides the students with essential knowledge of mechanisms of diseases including alterations in body system and their associated pathological features.	

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the mechanisms by which diseases occur.
2.		a2. Determine the pathological changes in normal body systems that occur during diseases.
3.	B1	b1. Differentiate between common pathological features such as inflammation, lesions, etc.
4.		b2. Interpret pathological features of diseases.
5.		b3. Relate between pathological features and diseases progress.
6.	B2	b4. Predict progress of common type of diseases.
7.	B4	b5. Assess the stage of disease progress.
8.	C4	c1. Search efficiently for information using documented and electronic sources of information.
9.		c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
10.	D1	d1. Share successfully in team-work.
11.	D2	d2. Show respect to life.
12.	D3	d3. Communicate effectively with his/her colleagues.
13.	D5	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam, Attendance

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies

<b>b1, b2</b>	Lecture, feed-back learning	Written exam , Attendance, quizzes
<b>b3</b>	Lecture	Written exam , Attendance
<b>b4</b>	Lecture	Written exam , Attendance, quizzes
<b>b5</b>	Lecture , feed-back learning	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
<b>c1, c2</b>	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
<b>d1, d3</b>	Feed-back learning	Assignments
<b>d2</b>	Lecture	Written exam , Attendance
<b>d4</b>	Feed-back learning	Assignments

IV. Course Content:					
Order	Units/Topics List	Sub Topics List	No. of Weeks	Contact hours	Course Learning Outcomes
1	<b>Introduction</b>	<ul style="list-style-type: none"> <li>▪ Importance of the study of pathology</li> <li>▪ Definition of terms</li> <li>▪ Methods and techniques</li> <li>▪ Cellular and Tissue changes</li> </ul> <p><b>Cell injury</b> : mechanisms, failure of cell repair, cell death; apoptosis , adaptationelectrolyte imbalance.</p>	2	4	a1, a2, b1, b2, b3, b4, b5
2	<b>Alteration in body fluids and electrolytes and acid-base balance:</b>	mechanism, prognosis	2	4	a1, a2, b1, b2, b3, b4, b5
3	<b>Pathological Alteration in body defense:</b>	stress, inflammation, lesions, alteration in tissue repair , fever, alteration in immune response : allergy and hypersensitivity	2	4	a1, a2, b1, b2, b3, b4, b5
<ul style="list-style-type: none"> <li>• Mid-term exam</li> <li>• post-exam discussion</li> </ul>			1	2	
4	<b>Pathological Alteration in body defense</b>	alteration in immune response immunopathology, immunodeficiency	2	4	a1, a2, b1, b2, b3, b4, b5
5	<b>Genetic impact on diseases</b>	<ul style="list-style-type: none"> <li>• Diseases caused by single – gene defects</li> <li>• -Disorders with multifactor polygenic inheritance</li> <li>• Cytogenetic disorders (Down s syndrome )</li> <li>• sex chromosome disorders</li> <li>• klinefelters syndrome XYY</li> </ul>	2	4	a1, a2, b1, b2, b3, b4, b5
6	<b>Pathological Alterations in the</b>	alteration in blood cells count alteration in blood count	2	4	a1, a2, b1, b2, b3, b4, b5

	<b>Hematologic System</b>				
7	<b>Pathology of cancer</b>	etiology, carcinogenic agents, cellular ad histological changes, types of cancers	2	4	a1, a2, b1, b2, b3, b4, b5
	Course Review		1	2	
	Final exam		1		a1, a2, b1, b2, b3, b4, b5
<b>Number of Weeks /and Units Per Semester</b>			<b>16</b>	<b>32</b>	<b>7 units</b>

## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Field training**: each 2-3 students are commissioned to do certain assignments in a real field entity such as drug factory, hospitals, pharmacies under supervision of both the field principle and an academic supervisor

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report on one pathological features such as inflammation, lesion, allergy, etc.	c1, c2, d4	4	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report on a correlation of one disease to its pathological features.	c1, c2, d1, d3, d4	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a2, a2, b1, b2, b3, b4, b5, d2
2	Assignments (1 + 2)	4, 14	10	10	c1, c2, d1, d3, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b4, b5, b6, b3, b8, b4
4	Mid-semester exam of theoretical part (written exam)	7	20	20	a2, a2, b1, b2, b3, b4, b5, d2
5	Final exam of theoretical part (written exam)	17	60	60	a2, a2, b1, b2, b3, b4, b5, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s)

1. James OD Oxford Textbook of Pathology, Oxford press, 2012.

### 2- Essential References.

1. John H. Bircky, Essentials of Anatomic and Clinical Pathology , 2<sup>nd</sup> ed. (2001). Health Professions Institute.

### 3- Electronic Materials and Web Sites etc.

<http://en.wikipedia.org>



## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of PATHOLOGY

I. Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							X

II. Course Description:
The course provides the students with essential knowledge of mechanisms of diseases including alterations in body system and their associated pathological features.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the mechanisms by which diseases occur.
2.		a2. Determine the pathological changes in normal body systems that occur during diseases.
3.	B1	b1. Differentiate between common pathological features such as inflammation, lesions, etc.
4.		b2. Interpret pathological features of diseases.
5.		b3. Relate between pathological features and diseases progress.
6.	B2	b4. Predict progress of common type of diseases.
7.	B4	b5. Assess the stage of disease progress.
8.	C4	c1. Search efficiently for information using documented and electronic sources of information.
9.		c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
10.	D1	d1. Share successfully in team-work.
11.	D2	d2. Show respect to life.
12.	D3	d3. Communicate effectively with his/her colleagues.
13.	D5	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam, Attendance

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, feed-back learning	Written exam, Attendance,

		quizzes
b3	Lecture	Written exam , Attendance
b4	Lecture	Written exam , Attendance, quizzes
b5	Lecture , feed-back learning	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
c1, c2	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
d1, d3	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d4	Feed-back learning	Assignments

<b>IV. Course Content:</b>					
<b>Order</b>	<b>Units/Topics List</b>	<b>Sub Topics List</b>	<b>No. of Weeks</b>	<b>Contact hours</b>	<b>Course Learning Outcomes</b>
1	<b>Introduction</b>	<ul style="list-style-type: none"> <li>▪ Importance of the study of pathology</li> <li>▪ Definition of terms</li> <li>▪ Methods and techniques</li> <li>▪ Cellular and Tissue changes</li> </ul> <p><b>Cell injury</b> : mechanisms, failure of cell repair, cell death; apoptosis , adaptation electrolyte imbalance.</p>	2	4	a1, a2, b1, b2, b3, b4, b5
2	<b>Alteration in body fluids and electrolytes and acid-base balance:</b>	mechanism, prognosis	2	4	a1, a2, b1, b2, b3, b4, b5
3	<b>Pathological Alteration in body defense:</b>	stress, inflammation, lesions, alteration in tissue repair , fever, alteration in immune response : allergy and hypersensitivity	2	4	a1, a2, b1, b2, b3, b4, b5
<ul style="list-style-type: none"> <li>• Mid-term exam</li> <li>• post-exam discussion</li> </ul>			1	2	
4	<b>Pathological Alteration in body defense</b>	alteration in immune response immunopathology, immunodeficiency	2	4	a1, a2, b1, b2, b3, b4, b5
5	<b>Genetic impact on diseases</b>	<ul style="list-style-type: none"> <li>• Diseases caused by single – gene defects</li> <li>• -Disorders with multifactor polygenic inheritance</li> <li>• Cytogenetic disorders (Down s syndrome )</li> <li>• sex chromosome disorders</li> <li>• klinefelters syndrome XYY</li> </ul>	2	4	a1, a2, b1, b2, b3, b4, b5
6	<b>Pathological Alterations in the</b>	alteration in blood cells count alteration in blood count	2	4	a1, a2, b1, b2, b3, b4, b5

	<b>Hematologic System</b>				
7	<b>Pathology of cancer</b>	etiology, carcinogenic agents, cellular ad histological changes, types of cancers	2	4	a1, a2, b1, b2, b3, b4, b5
	Course Review		1	2	
	Final exam		1		a1, a2, b1, b2, b3, b4, b5
<b>Number of Weeks /and Units Per Semester</b>			<b>16</b>	<b>32</b>	<b>7 units</b>

## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Field training**: each 2-3 students are commissioned to do certain assignments in a real field entity such as drug factory, hospitals, pharmacies under supervision of both the field principle and an academic supervisor

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report on one pathological features such as inflammation, lesion, allergy, etc.	c1, c2, d4	4	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report on a correlation of one disease to its pathological features.	c1, c2, d1, d3, d4	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a2, a2, b1, b2, b3, b4, b5, d2
2	Assignments (1 + 2)	4, 14	10	10	c1, c2, d1, d3, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b4, b5, b6, b3, b8, b4
4	Mid-semester exam of theoretical part (written exam)	7	20	20	a2, a2, b1, b2, b3, b4, b5, d2
5	Final exam of theoretical part (written exam)	17	60	60	a2, a2, b1, b2, b3, b4, b5, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s)</b>
2. James OD Oxford Textbook of Pathology, Oxford press, 2012.
<b>2- Essential References.</b>
1. John H. Bircky, Essentials of Anatomic and Clinical Pathology , 2 <sup>nd</sup> ed. (2001). Health Professions Institute.
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.



## PHARMACEUTICS I

### Course Plan (Syllabus) of PHARMACEUTICS I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course provides introduction to pharmaceuticals as a science of dosage form design and also deals with the study of non-sterile liquid pharmaceutical preparations.

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	definitions and brief history of pharmaceuticals, dosage forms, pharmacopeia, active ingredients, excipients.	1	2
2	<b>Compounded prescriptions</b>	formula, incompatibilities, general operations (maceration, percolation, filtration, mixing, size-reducing, etc)	2	4
3	<b>Pharmaceutical excipients</b>	roles, types with examples	1	2
4	<b>Pharmaceutical dosage forms</b>	the need to dosage forms, classification (according to physical form, route of administration, etc.)	1	2
5	<b>Old pharmaceutical dosage forms</b>	Galenicals, mucilages, lozenges, cachets, pills, glycerites, etc.	1	2
<b>Mid-semester exam</b>			1	2
6	<b>Non-sterile Pharmaceutical solutions</b>	definition of solutions, advantages, disadvantages, general method of preparation, enhancement of dissolution, excipients, types of waters	1	2
7	<b>Aqueous Pharmaceutical solutions</b>	(aromatic waters, douches, mouthwashes, syrups, linctuses, non-syrup oral solutions, and enemas) : general characters advantages, disadvantages, method of preparation, purpose of each type.	1	2
8	<b>Non-Aqueous Pharmaceutical solutions</b>	(concentrated water, spirits, elixirs, collodions, liniments, sprays, fluidextracts, tinctures), , method of preparation, purpose of each type, general characters	1	2

9	<b>Non-sterile liquid Dispersion systems</b>	<p>definition, difference from solutions, advantages, disadvantages.</p> <ul style="list-style-type: none"> <li>• <b>Colloidals:</b> types, advantages, disadvantages, properties , examples.</li> <li>• <b>suspensions</b> definition, types, advantages, disadvantages, physical properties ( sedimentation, stability, flocculated, deflocculated, zeta-potential), excipients, method of preparation, examples</li> <li>• <b>emulsions</b> definition, types, advantages, disadvantages, physical stability, excipients, method of preparation, examples</li> <li>• <b>Microemulsions and nanoemulsion:</b> definition, types, advantages, disadvantages, physical stability, excipients, method of preparation, examples</li> </ul>	3	6
10	<b>Non-sterile Drops and mixtures</b>	definition, types, formulation requirements,	1	2
<b>Course Review</b>		Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>			1	2
<b>TOTAL</b>			16	32
<b>Number of Weeks /and Units Per Semester</b>			16 week	10 Units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	
1.	introduction to pharmaceutical organic chemistry Lab.: safety requirements, list of experiments, How to report, etc.	1	2	
2.	Preparation of aqueous solutions : aromatic water (Pippermint water)	1	2	
3.	Preparation of aqueous solutions : mouthwash (boric acid M.W.)	1	2	
4.	Preparation of aqueous solutions : Syrups (simple syrpy.)	1	2	
5.	Preparation of aqueous solutions : cough Syrup (linctuses) (ammonium chloride syrpy.)	1	2	
6.	Preparation of non-aqueous solutions : Elixirs (Aromatic elixir)	1	2	
7.	Preparation of non-aqueous solutions : liniments (camphor liniment)	1	2	
8.	Preparation of liquid dispersion systems : emulsions (castor oil emulsion)	1	2	
9.	Preparation of liquid dispersion systems : emulsions (liquid paraffin emulsion)	1	2	
10.	Preparation of liquid dispersion systems : suspensions (calamine lotion)	1	2	
11.	Review	1	2	
PRACTICAL EXAM		1	2	
<b>Total</b>		12	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	
1	Attendance	1 - 15	2	2	
2	Assignments (1 + 2)	4-13, 14	5	5	
3	Quiz 1 + Quiz 2	7, 12	3	3	
4	Mid-semester exam of theoretical part ( written exam	7	10	10	
5	Final exam of theoretical part ( written exam)	17	40	40	
TOTAL			60	60 %	60

Practicalpart assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	
1	Lab. Attendance	Weekly	5	5	
2	Lab. Attitude	weekly	2	2	
3	Lab. Accomplishments	weekly	5	5	
4	Lab. Reporting	weekly	3	3	
5	Exam of practice theory (written exam or oral exam)	14	5	5	
6	Practical exam (practical)	14	20	20	
Total			40	40 %	

VIII. Learning Resources	
<b>1- Required Textbook(s) ( maximum two ).</b>	
1. Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone, UK 2. Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA	
<b>2- Essential References.</b>	
1. Rawlins. Bentley s of text book of pharmaceutics 2. Raph. practical pharmaceutics	
<b>3- Electronic Materials and Web Sites etc.</b>	
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>	

## Course Plan (Syllabus) of PHARMACEUTICAL MICROBIOLOGY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

IV. Course Content:				
A – Theoretical Aspect:				
Order	Units/ Topics List	Sub Topics List	No. of Weeks	conta ct hours
1	<b>Introduction to Microbiology</b>	<ul style="list-style-type: none"> <li>• Definition, brief history, role in medical sciences</li> <li>• Prokaryotes and Eukaryotes</li> <li>• Role of microorganisms in life</li> <li>• Classification of microorganisms.</li> </ul>	1	2
2	<b>Bacteria</b>	<ul style="list-style-type: none"> <li>• Nomenclature , Morphology and fine structures, biological process : (growth, reproduction , nutrition)</li> <li>• Classification</li> <li>• Study of the microscopical features , common infections and culture media of pathogenic bacteria e.g. Staphylococci , Streptococci, Neisseriae, E.coli, pseudomonas, , Mycobacteria , Vibrio , Mycoplasma , Ureaplasma, Chlamydia etc.</li> </ul>	3	6
3	<b>Micro-organisms other than bacteria</b>	<ul style="list-style-type: none"> <li>• <b>Fungi:</b> Types, morphology, Reproduction and physiology. Pathogenic yeasts , dermatophytes, aspergillus</li> <li>• <b>Rickettsiae:</b> Introduction, characteristics, Pathogenic rickettsiae, laboratory diagnosis of rickettsiai diseases.</li> <li>• <b>Viruses:</b> History of viruses. Classification. Characteristics. Reproduction and culture of viruses. Virus inhibition. Control of virus infections.</li> </ul>	3	6
MID-TERM EXAM			1	2

4	<b>Application of microbiology in pharmacy</b>	<ul style="list-style-type: none"> <li>• Methods of Preservation and sterilization of pharmaceutical preparations</li> <li>• common pharmaceutical preservatives</li> <li>• Pharmacopeial requirements of microbial contents in various pharmaceutical dosage forms.</li> <li>• Procedures for microbial content test</li> <li>• Culture media preparation</li> <li>• Study of antimicrobial activity of drugs : methods, culture media, etc.</li> </ul>	6	12
<b>Course Review</b>		Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>			1	2
<b>TOTAL</b>			16	32
<b>Number of Weeks /and Units Per Semester</b>			16 weeks	4 Units

### B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours
1.	introduction to the Lab.: safety requirements, list of experiments, How to report, source of errors, etc.	1	2
2.	Sterilization & disinfection of plastic and glasswares	1	2
3.	Preparation of culture media and inoculums for microorganisms	1	2
4.	Wet preparation & Microscopical characteristics differentiation of bacteria: streptococci, staphylococci, E.coli, pseudomonas aueroginoa, Nesseria, M. tuberculosis.	3	6
5.	Microscopical characteristics differentiation of Fungi Candida albicans.	1	2
6.	Antimicrobial activity of certain antimicrobial disks.	1	2
7.	Antimicrobial activity of certain antimicrobial dermatological products using dilution method	1	2
8.	Determination of microbial content (e.g. staphylococci) in pharmaceutical product : paracetamol syrup	1	2
9.	Testing of sterility of pharmaceutical products	1	2
<b>PRACTICAL EXAM</b>		1	2
<b>Total</b>		12	24 equivalent to 12 credit hours
<b>Number of Weeks</b>			12

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.

The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	
2	Assignments (1 + 2)	4-13, 14	5	5	
3	Quiz 1 + Quiz 2	7, 12	3	3	
4	Mid-semester exam of theoretical part ( written exam	7	10	10	
5	Final exam of theoretical part ( written exam)	17	40	40	
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	
1	Lab. Attendance	Weekly	5	5	
2	Lab. Attitude	weekly	2	2	
3	Lab. Accomplishments	weekly	5	5	
4	Lab. Reporting	weekly	3	3	
5	Exam of practice theory (written exam or oral exam)	14	5	5	
6	Practical exam (practical)	14	20	20	
Total			40	40 %	





## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Chandrakanty pharmaceutical microbiology

### 2- Essential References.

1. W. B. Hugo: pharmaceutical microbiology, 1998, Black well science LTD.
2. Aulton, pharmaceutics the science of dosage form design, 2002, Churchill Livingstone
3. Kar. Pharmaceutical microbiology

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## Course Specification

### MEDICINAL CHEMSITRY I

I. Course Identification and General Information:							
1.	Course Title:	MEDICINAL CHEMSITRY I					
2.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		3	-	-	1		-
3.	Study level/ semester at which this course is offered:	( SECOND ) Year – ( 2 <sup>ND</sup> ) semester					
4.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>• General chemistry</li> <li>• Organic chemistry</li> <li>• Pharmaceutical organic chemistry</li> </ul>					
5.	Language of teaching the course:	ENGLISH					

IV. Course Content:				
A – Theoretical Aspect:				
Order	Units/ Topics List	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to medicinal chemistry</b>	<ul style="list-style-type: none"> <li>• definitions, brief history, roles in pharmacy.</li> <li>• Physicochemical properties in relation to biological activity (structure-activity relationship "SAR").</li> <li>• Basics of chemical drug designing : patent burst, synthesis of fragments, etc.</li> </ul>	1	3
2	<b>Drug-receptor interaction &amp; Stereochemistry of drugs</b>	<ul style="list-style-type: none"> <li>• binding and drug-receptor interaction : chemical bonding and biological activity</li> <li>• stereochemical aspects of drug action</li> <li>• isosterism and bioisosterism</li> </ul>	1	3
3	<b>chemistry of Drug metabolism</b>	<ul style="list-style-type: none"> <li>• phase I reactions</li> <li>• phase II reactions</li> <li>• Metabolites: inactive, active , more active</li> </ul>	1	3

4	Drugs acting on the autonomic nervous system	<b>Physicochemical properties, synthesis, purification, structure-activity relationship, metabolism of drugs acting on sympathetic system</b> <ul style="list-style-type: none"> <li>Indirectly sympatholytic drugs</li> <li>Directly sympatholytic drugs : adrenergic blocking agents</li> <li>Indirectly sympatholytic drugs</li> <li>Directly sympatholytic drugs : adrenergic blocking agents</li> </ul>	2	6
		<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of drugs acting on parasympathetic system</b> <ul style="list-style-type: none"> <li>Indirectly parasympathomimetics</li> <li>Direct parasympathomimetics : cholinergic agonists</li> <li>Indirectly parasympatholytic drugs</li> <li>Directly sympatholytic drugs : cholinergic blocking agents</li> <li><b>Drugs acting on autonomic ganglia:</b> Ganglionic stimulants, ganglionic</li> </ul>	2	6
MID-TERM EXAM			1	2
5	Drugs affecting skeletal muscles	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of drugs acting on parasympathetic system</b> <ul style="list-style-type: none"> <li>Neuromuscular blocking agents</li> <li>Central muscles relaxants</li> </ul>	1	3
6	Ophthalmic drugs	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of drugs acting on parasympathetic system</b> <ul style="list-style-type: none"> <li>Parasympathomimetic and parasympatholytics agents used for eye disorders.</li> <li>Adrenergic agonists and antagonists used for eye disorders</li> <li>Carbonic anhydrase inhibitors</li> <li>Prostaglandin analogues</li> <li>Osmotic agents</li> </ul>	2	6

		" Topics of Anti-inflammatory, antihistamins, antibiotics used for eye disorders will be discussed in next pharmacology courses"		
7	<b>Drugs for alimentary system disorders</b>	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Antacids and Drugs for Peptic Ulcer</li> <li>• Anti- emetics</li> <li>• Laxatives</li> <li>• Anti-diarrheal</li> <li>• Antispasmodics</li> <li>• Drugs for irritable colon</li> <li>• Hepatic protectives</li> <li>• Drugs for gall bladder disorders</li> </ul>	3	9
<b>Course Review</b>		Review of the course topics by discussion session.	1	3
FINAL - EXAM			1	3
<b>TOTAL</b>			16	47
<b>Number of Weeks /and Units Per Semester</b>			16 weeks	6 Units

<b>B - Practical Aspect:</b>			
Order	Tasks/ Experiments	Number of Weeks	contact hours
1.	introduction to pharmaceutical organic chemistry Lab.: safety requirements, list of experiments, How to report, etc.	1	2
2.	Pharmacopeial physicochemical properties , identification of: adrenergic agonist : <b>adrenaline</b>	1	2
3.	Pharmacopeial physicochemical properties , identification of : adrenergic blockers : <b>atenolol</b>	1	2
4.	Pharmacopeial physicochemical properties , identification of : parasympathomimetics : <b>neostigmine</b>	1	2
5.	Pharmacopeial physicochemical properties , identification of : cholinergic blockers : <b>atropine</b>	1	2
6.	Pharmacopeial physicochemical properties , identification of : skeletal muscle relaxants <b>suxamethonium</b>	1	2
7.	Pharmacopeial physicochemical properties , identification of : drugs used for eye disorders : <b>pilocarpineeye drops.</b>	1	2
8.	Pharmacopeial physicochemical properties , identification of : anti-peptic ulcer : omeprazole	1	2
9.	Pharmacopeial physicochemical properties , identification of : antispasmodics : mebeverine	1	2
10.	Synthesis of drugs	1	2
11.	Purification of drugs.	1	2
PRACTICAL EXAM		1	2
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>
<b>Number of Weeks</b>			<b>12</b>

<b>VIII. Learning Resources:</b>
<b>1- Required Textbook(s) ( maximum two ).</b>
1. Gareth Thomas, Medicinal chemistry: an introduction to, 2007 John Wiley & Sons Ltd, 2. Siddique. A textbook of medicinal chemistry
<b>2- Essential References.</b>
1. AshutochKar. Medicinal chemistry, 2007, New age international publisher 2. Rajie. Pharmaceutical chemistry 3. Wermuth. The practice of medicinal chemistry
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## Course Specification

### PHYSIOLOGY II

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	PHYSIOLOGY II					
2.	Course Code & Number:	PHRC 01					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( SECOND ) Year – ( 2 <sup>ND</sup> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General biology</li> <li>Anatomy &amp; histology</li> <li>Physiology I</li> </ul>					
6.	Co –requisite (if any):	-----					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course concerns with the study of functions and regulation of blood , cardiovascular, respiratory, alimentary ,renal and immune systems in human body.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Determine the normal functions and regulation of blood , cardiovascular , respiratory, alimentary ,renal and immune systems in human body
2.	A2	a2. Explain the biological role of certain endogenous substances that affect regulation and normal functions of blood , cardiovascular , respiratory, alimentary ,renal and immune systems in human body
3.	B1	b1. Identify the signs of normal functions of blood , cardiovascular , respiratory, alimentary ,renal and immune systems in human body
4.		b2. Interpret the outcomes of normal functions of blood , cardiovascular , respiratory, alimentary ,renal and immune systems.
5.	B2	b3. Classify immune system physiologically.
6.		b4 .Relate the normal functions of blood , cardiovascular , respiratory, alimentary ,renal and immune systems to their affecting factors.
7.	B4	b5 . Assess the normal functions of blood , cardiovascular , respiratory, alimentary ,renal and immune systems in human body.
8.	C4	c1. Present his/her thoughts , search for information and report works effectively using appropriate references books , internet and technologies media
9.	D1	d1. Share successfully in team-work.
10.	D2	d2. Show respect to life.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture,, laboratory practice	written exam , , assignment
a2	Lecture, feed-back learning	written exam , assignment
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Feed-back learning, Group-project.	Written exam
b3	Lecture , , feed-back learning	written exam , quizzes
b4	Lecture, feed-back learning	written exam, quizzes
b5	Lecture	written exam
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	Feed-back learning ,Group-project.	assignment
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Group-project ,, feed-back learning	Assignment
d2	lecture	Written exam



IV. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Cardiovascular system</b>	a1, a2, b1, b2, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>the heart: functions and regulation of the heart work, physiologic parameters of the heart work: heart rate, cardiac output, heart rhythmicity, conductivity, contraction</li> <li>Blood vessels: functions and regulation of the blood vessels (veins, arteries, capillaries), physiologic parameters of the blood vessels : blood pressure, peripheral vascular resistance.</li> </ul>	3	6
2	<b>The Blood</b>	a1, a2, b1, b2, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>Blood composition, functions and regulation of plasma, RBCs, WBCs and platelets.</li> <li>Circulation: regulations and factors affecting venous return and blood flow.</li> </ul>	2	4
3	<b>Respiratory system</b>	a1, a2, b1, b2, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>blood-gas interface, airways, the pleura, mechanism of breathing, Ventilation, Diffusion , Partial pressures of oxygen and carbon dioxide, Ventilation–perfusion matching, Gas transport in blood , Regulation of ventilation, Ventilator response to exercise.</li> </ul>	2	4
				1	2
4	<b>Alimentary system</b>	a1, a2, b1, b2, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>functions and regulations of the mouth, pharynx and the gastrointestinal tract (esophagus, stomach, small and large intestine</li> <li>the digestive system associated – organs: the liver, gall bladder., spleen and pancreases</li> </ul>	2	4

5	<b>Renal system</b>	a1, a2, b1, b2, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>• basic unit of the kidney</li> <li>• renal blood flow, glomerular filtration, active excretion tubular reabsorption,</li> <li>• regulation of plasma volume and plasma osmolality</li> </ul>	2	4
6	<b>immune system</b>	a1, a2, b1, b2, b3, b4, b5, d2	compositions, types, functions , regulations	2	4
	<b>Course Review</b>	a1, a2, b1, b2, b3, b4, b5, d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to do a search on one endogenous mediator that is involved in one of the physiological studied and provide a summary report on it.	a2, c1	4-13	6
2	<b>Group :</b> each group of students will be assigned todo a search on one of the physiological processes studied and make a summary report.	a1, c1, d1	13	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, b4, b5,c1, d2
2	Assignments (1 + 2)	4-13, 14	10	10	a1, a2, c1, d1
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b4
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, b4, b5,c1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, b4, b5,c1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
<ol style="list-style-type: none"> <li>1. C.C.Chatterjee. Human physiology</li> <li>2. Laurie kelly . Essential of human physiology for pharmacy, 2004, CRC press</li> </ol>
<b>2- Essential References.</b>
<ol style="list-style-type: none"> <li>1. Hassan Hamdi, Fundamentals of human physiology</li> <li>2. Salah Abu-Sitta , Synopsis of medical physiology</li> <li>3. W. F. Ganong. Review of medical physiology</li> </ol>
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of PHYSIOLOGY II

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course concerns with the study of functions and regulation of blood , cardiovascular , respiratory, alimentary ,renal and immune systems in human body.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Determine the normal functions and regulation of blood , cardiovascular , respiratory, alimentary ,renal and immune systems in human body
2.	A2	a2. Explain the biological role of certain endogenous substances that affect regulation and normal functions of blood , cardiovascular , respiratory, alimentary ,renal and immune systems in human body
3.	B1	b1. Identify the signs of normal functions of blood , cardiovascular , respiratory, alimentary ,renal and immune systems in human body
4.		b2. Interpret the outcomes of normal functions of blood , cardiovascular , respiratory, alimentary ,renal and immune systems.
5.	B2	b3. Classify immune system physiologically.
6.		b4 .Relate the normal functions of blood , cardiovascular , respiratory, alimentary ,renal and immune systems to their affecting factors.
7.	B4	b5 . Assess the normal functions of blood , cardiovascular , respiratory, alimentary ,renal and immune systems in human body.
8.	C4	c1. Present his/her thoughts , search for information and report works effectively using appropriate references books , internet and technologies media
9.	D1	d1. Share successfully in team-work.
10.	D2	d2. Show respect to life.

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture,, laboratory practice	written exam , , assignment
a2	Lecture, feed-back learning	written exam , assignment

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Feed-back learning , Group-project.	Written exam
b3	Lecture, , feed-back learning	written exam , quizzes
b4	Lecture, feed-back learning	written exam, quizzes
b5	Lecture	written exam
<b>(C)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	Feed-back learning ,Group-project.	assignment
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Group-project , , feed-back learning	Assignment
d2	lecture	Written exam

#### IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Cardiovascular system</b>	a1, a2, b1, b2, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>the heart: functions and regulation of the heart work, physiologic parameters of the heart work: heart rate, cardiac output, heart rhythmicity, conductivity, contraction</li> <li>Blood vessels: functions and regulation of the blood vessels (veins, arteries, capillaries), physiologic parameters of the blood vessels : blood pressure, peripheral vascular resistance.</li> </ul>	3	6
2	<b>The Blood</b>	a1, a2, b1, b2, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>Blood composition, functions and regulation of plasma, RBCs, WBCs and platelets.</li> <li>Circulation: regulations and factors affecting venous return and blood flow.</li> </ul>	2	4
3	<b>Respiratory system</b>	a1, a2, b1, b2, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>blood-gas interface, airways, the pleura, mechanism of breathing, Ventilation, Diffusion , Partial pressures of oxygen and carbon dioxide, Ventilation–perfusion matching, Gas transport in blood , Regulation of ventilation, Ventilator response to exercise.</li> </ul>	2	4
				1	2
4	<b>Alimentary system</b>	a1, a2, b1, b2, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>functions and regulations of the mouth, pharynx and the gastrointestinal tract (esophagus, stomach, small and large intestine</li> <li>the digestive system associated – organs: the liver, gall bladder., spleen and pancreases</li> </ul>	2	4



5	<b>Renal system</b>	a1, a2, b1, b2, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>• basic unit of the kidney</li> <li>• renal blood flow, glomerular filtration, active excretion tubular reabsorption,</li> <li>• regulation of plasma volume and plasma osmolality</li> </ul>	2	4
6	<b>immune system</b>	a1, a2, b1, b2, b3, b4, b5, d2	compositions, types, functions , regulations	2	4
<b>Course Review</b>		a1, a2, b1, b2, b3, b4, b5, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search on one endogenous mediator that is involved in one of the physiological studied and provide a summary report on it.	a2, c1	4-13	6

2	<b>Group</b> : each group of students will be assigned to do a search on one of the physiological processes studied and make a summary report.	a1, c1, d1	13	4
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### VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, b4, b5, c1, d2
2	Assignments (1 + 2)	4, 14	10	10	a1, a2, c1, d1
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b4
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, b4, b5, c1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, b4, b5, c1, d2
TOTAL			100	100 %	100

### IX. Learning Resources:

#### 1- Required Textbook(s) ( maximum two ).

1. C.C.Chatterjee. Human physiology
2. Laurie Kelly . Essential of human physiology for pharmacy, 2004, CRC press

#### 2- Essential References.

1. Hassan Hamdi, Fundamentals of human physiology
2. Salah Abu-Sitta , Synopsis of medical physiology
3. W. F. Ganong. Review of medical physiology

#### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

### IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PHARMACOLOGY I

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	PHARMACOLOGY I					
2.	Course Code & Number:	PHRC 02					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		3	-	-	-		-
4.	Study level/ semester at which this course is offered:	( SECOND ) Year – ( 2 <sup>ND</sup> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General biology</li> <li>Anatomy and histology</li> <li>Physiology I, II</li> </ul>					
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>Medicinal chemistry I</li> <li>Pathology</li> </ul>					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course provides the students with knowledge of mechanisms of drugs on the body including drug-receptors interaction and effect of body on drugs. The course also deals with the study of pharmacodynamic and pharmacokinetics of drugs affecting autonomic nervous system, skeletal muscles and drugs used for eye and alimentary system disorders.

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A2	a1. Explicit the various types of pharmacokinetics, mechanisms of action (MAO) , adverse effects , doses (effective, lethal ) , therapeutic index and drug interactions of drugs.
2.		a2. Determine pharmacokinetics (absorption, distribution, metabolism and excretion) and drug benefits (therapeutic actions, indications, efficacy and potency) & drug posology of drugs affecting autonomic nervous system, skeletal muscles and drugs used for eye and alimentary system disorders.
3.		a3. Discuss drug limitations (side effects, contraindications, precautions, use in special patent categories and drug interactions) of drugs affecting autonomic nervous system, skeletal muscles and drugs used for eye and alimentary system disorders.
4.	A4	a4. Comprehend his/her role as a pharmacist in providing correct information on rational use of medications.
5.	B2	b1 .Classify drugs used for disorders of drugs affecting autonomic nervous system, skeletal muscles and drugs used for eye and alimentary system disorders.
6.		b2. Compare between therapeutically related drugs based on drug benefits ( in particular efficacy and potency)and drug limitations.
7.		b3. Relate drug indications to MAO of drugs.
8.	B3	b4. Predict drug limitations on the basis of Drug MOA.
9.	B4	b5. Select an appropriate drug for patients based on drug benefits and limitation.
10.	C1	c1. Provide correct information on drug benefits and limitation.
11.	C2	c2 .Search efficiently for information using documented and electronic sources of information.
12.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
13.	D1	d1. Share successfully in team-work.
14.	D2	d2. Show respect to life.
15.	D5	d3. Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture	Written exam , Attendance
a4	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3	Lecture	Written exam , Attendance, quizzes
b4	Lecture	Written exam , Attendance
b5	Lecture	Written exam , Attendance
<b>(c)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	lecture, feed-back learning	written exam, attendance, assignment
c2	feed-back learning, Group-project	Assignments
c3	laboratory practice	Practical assessment (Lab. attendance, reporting, practical exam)
c3	Feed-back learning Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d3	Feed-back learning	Assignments

IV. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to pharmacology</b>  ( <b>General pharmacology</b> )	a1, a4, b2, b3, b4, b5, c1, d2	<ul style="list-style-type: none"> <li>• Definition, brief history</li> <li>• Divisions of pharmacology (pharmacokinetics, pharmacodynamics : definitions, field of concern)</li> <li>• Dose-Response curve</li> <li>• Types of dose (effective, lethal), therapeutic index</li> <li>• Drug efficacy and drug potency</li> <li>• Mechanisms of drug action : drug targets (receptors, enzymes, ion channels, etc).</li> <li>• receptor theory , types of receptors, affinity, specificity, selectivity, agonist, antagonist, competitive and non-competitive , reversible and irreversible.</li> <li>• Enzymes as drug targets : types, examples, mechanisms</li> <li>• Ion channels as drug target : types, examples, mechanisms</li> <li>• Neurotransmitters and autacoids: physiopathologic roles</li> <li>• Types of drug adverse effects with examples</li> <li>• Types of drug interactions effects with examples</li> <li>• Pharmacokinetics ( in brief) : drug absorption, distribution, metabolism, excretion</li> </ul>	3	6

2	<b>Drugs acting on the autonomies nervous system</b>	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Indirectly sympathomimetics</li> <li>• Direct symapthomimetics: adrenergic agonists</li> <li>• Indirectly sympatholytic drugs</li> <li>• Directly sympatholytic drugs : adrenergic blocking agents</li> </ul>	2	6
	<b>Drugs acting on the autonomies nervous system</b>	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Indirectly parasympathomimetics</li> <li>• Direct parasympathomimetics : cholinergic agonists</li> <li>• Indirectly parasympatholytic drugs</li> <li>• Directly sympatholytic drugs : cholinergic blocking agents</li> <li>• <b>Drugs affecting autonomic ganglia:</b> ganglia stimulants , ganglia blockers</li> </ul>	2	6
<b>MID-TERM EXAM</b>				1	2
3	<b>Drugs affecting skeletal muscles</b>	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Neuromuscular blocking agents</li> <li>• Central muscles relaxants</li> </ul>	1	2
4	<b>Eye pharmacology</b>	a2, a3, a4, b1, b2, b3,	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and</b>	2	6



		b4, b5, c1, d2	<b>potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Parasympathomimetic and parasympatholytics agents used for eye disorders.</li> <li>• Adrenergic agonists and antagonists used for eye disorders</li> <li>• Carbonic anhydrase inhibitors</li> <li>• Prostaglandin analogues</li> <li>• Osmotic agents</li> </ul> <p><i>" Topics of Anti-inflammatory, antihistamins, antibiotics used for eye disorders will be discussed in next pharmacology courses"</i></p>		
5	<b>Drugs for alimentary system disorders</b>	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Antacids and Drugs for Peptic Ulcer</li> <li>• Anti- emetics</li> <li>• Laxatives</li> <li>• Anti-diarrheal</li> <li>• Antispasmodics</li> <li>• Drugs for irritable colon</li> <li>• Hepatic protectives</li> <li>• Drugs for gall bladder disorders</li> </ul>	3	9
	<b>Course Review</b>	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2	Review of the course topics by discussion session.	1	3
<b>FINAL - EXAM</b>				1	3
<b>TOTAL</b>				16	47
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	3 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the

student's brain through a group of questions &/or <b>Concepts map</b> : which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using <b>learning aids</b> such as Data show projector
<b>Feed-back learning</b> : students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
<b>Group projects</b> : students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

VI. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to prepare an index booklet of the drugs studied in the course. The index should contain the basic drug information on drug benefits and limitation.	c2, c3, d3	13	6
2	<b>Group</b> : each group of students will be assigned to provide a comparison chart on drugs of the same pharmacologic category. Comparison focuses on drug benefits and limitations.	b2, c2, c3, d1, d3	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2
2	Assignments (1 + 2)	4, 14	10	10	b2, c2, c3, d1, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b3
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a4, b2, b3, b4, b5, c1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Katzung –Basic and Clinical Pharmacology, (2007), McGraw-Hill
2. Rang, Dale and Ritter. Pharmacology, (2007), Churchill Livingstone.

### 2- Essential References.

1. Richard A. Harvey. Lippincott's pharmacology, 2000, Lippincott William and Wilkins.
2. Udaykumar. Text book of medical pharmacology

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to

	attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of PHARMACOLOGY I

I. - Information about Faculty Member Responsible for the Course:								
Name of Faculty Member	Pr.Dr. Rashad Al-namer		Office Hours					
Location & Telephone No.	Pharmacy department ; 774871511		SAT	SUN	MON	TUE	WED	THU
E-mail								

II. Course Description:
<p>The course provides the students with knowledge of mechanisms of drugs on the body including drug-receptors interaction and effect of body on drugs. The course also deals with the study of pharmacodynamic and pharmacokinetics of drugs affecting autonomic nervous system, skeletal muscles and drugs used for eye and alimentary system disorders.</p>

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A2	a1. Explicit the various types of pharmacokinetics, mechanisms of action (MAO) , adverse effects , doses (effective, lethal ) , therapeutic index and drug interactions of drugs.
2.		a2. Determine pharmacokinetics (absorption, distribution, metabolism and excretion) and drug benefits (therapeutic actions, indications, efficacy and potency) & drug posology of drugs affecting autonomic nervous system, skeletal muscles and drugs used for eye and alimentary system disorders.
3.		a3. Discuss drug limitations (side effects, contraindications, precautions, use in special patent categories and drug interactions) of drugs affecting autonomic nervous system, skeletal muscles and drugs used for eye and alimentary system disorders.
4.	A4	a4. Comprehend his/her role as a pharmacist in providing correct information on rational use of medications.
5.	B2	b1 .Classify drugs used for disorders of drugs affecting autonomic nervous system, skeletal muscles and drugs used for eye and alimentary system disorders.
6.		b2. Compare between therapeutically related drugs based on drug benefits ( in particular efficacy and potency)and drug limitations.
7.		b3. Relate drug indications to MAO of drugs.
8.	B3	b4. Predict drug limitations on the basis of Drug MOA.
9.	B4	b5. Select an appropriate drug for patients based on drug benefits and limitation.
10.	C1	c1. Provide correct information on drug benefits and limitation.
11.	C2	c2 .Search efficiently for information using documented and electronic sources of information.
12.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
13.	D1	d1. Share successfully in team-work.
14.	D2	d2. Show respect to life.
15.	D5	d3. Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture	Written exam , Attendance
a4	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3	Lecture	Written exam , Attendance, quizzes
b4	Lecture	Written exam , Attendance
b5	Lecture	Written exam , Attendance
<b>(c)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	lecture, feed-back learning	written exam, attendance, assignment
c2	feed-back learning, Group-project	Assignments
c3	laboratory practice	Practical assessment (Lab. attendance, reporting, practical exam)
c3	Feed-back learning Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d3	Feed-back learning	Assignments

IV. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to pharmacology</b>  ( <b>General pharmacology</b> )	a1, a4, b2, b3, b4, b5, c1, d2	<ul style="list-style-type: none"> <li>• Definition, brief history</li> <li>• Divisions of pharmacology (pharmacokinetics, pharmacodynamics : definitions, field of concern)</li> <li>• Dose-Response curve</li> <li>• Types of dose (effective, lethal), therapeutic index</li> <li>• Drug efficacy and drug potency</li> <li>• Mechanisms of drug action : drug targets (receptors, enzymes, ion channels, etc).</li> <li>• receptor theory , types of receptors, affinity, specificity, selectivity, agonist, antagonist, competitive and non-competitive , reversible and irreversible.</li> <li>• Enzymes as drug targets : types, examples, mechanisms</li> <li>• Ion channels as drug target : types, examples, mechanisms</li> <li>• Neurotransmitters and autacoids: physiopathologic roles</li> <li>• Types of drug adverse effects with examples</li> <li>• Types of drug interactions effects with examples</li> <li>• Pharmacokinetics ( in brief) : drug absorption, distribution, metabolism, excretion</li> </ul>	3	6



2	<b>Drugs acting on the autonomies nervous system</b>	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Indirectly sympathomimetics</li> <li>• Direct symapthomimetics: adrenergic agonists</li> <li>• Indirectly sympatholytic drugs</li> <li>• Directly sympatholytic drugs : adrenergic blocking agents</li> </ul>	2	6
	<b>Drugs acting on the autonomies nervous system</b>	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Indirectly parasympathomimetics</li> <li>• Direct parasympathomimetics : cholinergic agonists</li> <li>• Indirectly parasympatholytic drugs</li> <li>• Directly sympatholytic drugs : cholinergic blocking agents</li> <li>• <b>Drugs affecting autonomic ganglia:</b> ganglia stimulants , ganglia blockers</li> </ul>	2	6
<b>MID-TERM EXAM</b>				1	2
3	<b>Drugs affecting skeletal muscles</b>	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Neuromuscular blocking agents</li> <li>• Central muscles relaxants</li> </ul>	1	2
4	<b>Eye pharmacology</b>	a2, a3, a4, b1, b2, b3,	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and</b>	2	6

		b4, b5, c1, d2	<p><b>potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b></p> <ul style="list-style-type: none"> <li>• Parasympathomimetic and parasympatholytics agents used for eye disorders.</li> <li>• Adrenergic agonists and antagonists used for eye disorders</li> <li>• Carbonic anhydrase inhibitors</li> <li>• Prostaglandin analogues</li> <li>• Osmotic agents</li> </ul> <p><i>" Topics of Anti-inflammatory, antihistamins, antibiotics used for eye disorders will be discussed in next pharmacology courses"</i></p>		
5	<b>Drugs for alimentary system disorders</b>	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2	<p><b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b></p> <ul style="list-style-type: none"> <li>• Antacids and Drugs for Peptic Ulcer</li> <li>• Anti- emetics</li> <li>• Laxatives</li> <li>• Anti-diarrheal</li> <li>• Antispasmodics</li> <li>• Drugs for irritable colon</li> <li>• Hepatic protectives</li> <li>• Drugs for gall bladder disorders</li> </ul>	3	9
	<b>Course Review</b>	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2	Review of the course topics by discussion session.	1	3
<b>FINAL - EXAM</b>				1	3
<b>TOTAL</b>				16	47
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	3 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.

The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to prepare an index booklet of the drugs studied in the course. The index should contain the basic drug information on drug benefits and limitation.	c2, c3, d3	13	6
2	<b>Group</b> : each group of students will be assigned to provide a comparison chart on drugs of the same pharmacologic category. Comparison focuses on drug benefits and limitations.	b2, c2, c3, d1, d3	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2
2	Assignments (1 + 2)	4, 14	10	10	b2, c2, c3, d1, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b3
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a4, b2, b3, b4, b5, c1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2
<b>TOTAL</b>			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Katzung –Basic and Clinical Pharmacology, (2007), McGraw-Hill 2. Rang, Dale and Ritter. Pharmacology, (2007), Churchill Livingstone.
<b>2- Essential References.</b>
1. Richard A. Harvey. Lippincott's pharmacology, 2000, Lippincott William and Wilkins. 2. Udaykumar. Text book of medical pharmacology
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

### IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PHARMACOGNOSY I

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	PHARMACOGNOSY I					
2.	Course Code & Number:	PHRG 02					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( SECOND ) Year – ( 2 <sup>ND</sup> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General biology</li> <li>Botany</li> </ul>					
6.	Co –requisite (if any):	none					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course provides the students with introduction to medicinal plants as an important natural source of drugs. Besides, the course deals with study of common medicinal leaves, barks, roots and rhizomes

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A1	a1. Identify the botanical origin, morphological and microscopical characteristics of common medicinal leaves, barks, roots and rhizomes.
2.	A2	a2. Determine the active constituents and therapeutic use of common medicinal leaves, barks, roots and rhizomes.
3.	A3	a3. Discuss the principles and procedures applied for obtaining appropriate crude drugs from plants.
4.		a4. Explicit the methods used for detection of active constituents and discovering adulteration of medicinal plants.
5.	A4	a5. Comprehend his/her role as pharmacist in collection, detection, and rationaltherapeuticuse of medicinal plants.
6.	B1	b1. Express with drawings the morphology and key microscopical features of medicinal plants
7.		b2. Differentiate between common medicinal leaves, barks, roots and rhizomes based on morphological and microscopical features.
8.	B2	b3 .Classifyactiveconstituentsinmedicinal plants.
9.		b4. Compare between common medicinal leaves, barks, roots and rhizomes according to their botanical origin, plant parts, chemical structures and therapeutic use.
10.	B3	b5. Design a plan to obtain medicinal plants and crude drugs of high quality.
11.	B4	b6 . Assess the quality of medicinal plants and crude drugs.
12.		b7. Select the appropriate day time/season for cultivation of medicinal plants.
13.	C1	c1. Handlefficiently the tools and chemicals used in pharmacognosy and phytochemistry Lab.
14.		c2. Operate successfully the instruments used in pharmacognosy and phytochemistry Lab.
15.	C2	c3 .Perform effectively using standard procedures the practical works in pharmacognosy and phytochemistryLab. Includingpreparationofmedicinal crude drug samples for microscopical investigation and detection the active constituents and key-microscopical elements.

16.	C3	c4 .Take the required safety criteria during performing different types of pharmacy works
17.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
18.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1. Share successfully in team-work.
20.	D2	d2. Show respect to life.
21.	D3	d3. Communicate effectively with his/her colleagues.
22.	D4	d4.Behave in discipline during practicing practical and professional works and assignments.
23.	D5	d5. Demonstrate time management and self-learning during performing practical works and assignments.

2. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	laboratory practice, lab. practice	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam)
a2	Lecture	Written exam , Attendance
a3, a4	Lecture	Written exam , Attendance
a5	lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies



b1, b2	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3, b4	Lecture	Written exam , Attendance
b5	Lecture	Written exam , Attendance
b7	Lecture	Written exam , Attendance
b6	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)

**(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	Feed-back learning , Group-project	Assignments
c6	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam) , Assignments

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a3, a4, a5, b5,b6, b7, d2	<ul style="list-style-type: none"> <li><input type="checkbox"/> Definition, importance, and function, brief history</li> <li><input type="checkbox"/> Crude, official and unofficial drugs.</li> <li><input type="checkbox"/> Nomenclature of crude drugs (botanical, geographical and commercial sources of drugs)</li> <li><input type="checkbox"/> Classification of crude drugs (alphabetical, taxonomical, morphological, pharmacological and chemical)</li> <li><input type="checkbox"/> Cultivation (Disadvantages of collecting wild plants and advantages of cultivation, factors affecting cultivation).</li> <li><input type="checkbox"/> Collection (Time of the year, time of the day, stage of the development of the plant and general rules of collection).</li> <li><input type="checkbox"/> Post-collection processing of crude drugs: Drying(Natural methods, artificial methods, changes occurring after drying), Preservation and protection of crude drugs(deterioration during storage, physicochemical factors, biological factors, methods to destroy and control of insects)</li> <li><input type="checkbox"/> Adulteration(sophistication, substitution, admixture and deterioration, determination of adulteration.)</li> </ul>	4	8
2	<b>Natural Chemical constituents in plants</b>	a2, a4, a5	Types , biological and pharmaceutical and therapeutic roles of : starch, proteins, fixed oils and fats, terpenes, etc., gums, mucilage, resins, tannins ,alkaloids, volatile oils and glycosides etc.	2	4
<b>MID-TERM EXAM</b>				1	2

3	<b>Medicinal leaves</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, cultivation, adulteration detection, active constituents and medical uses of the following medicinal leaves: Digitalis, Senna, Stramonium, Belladonna, Hyoscymus, Bucho, Boldo , Coca, Jaborandi, Henna.	3	6
4	<b>Medicinal barks</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, cultivation, adulteration detection, active constituents and medical uses of the following medicinal barks:Cinchona, Cinnamon, Frangula, Quillaia, Pomegranate, Hamamelis and Galls.	2	4
5	<b>Medicinal roots and rhizomes</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, cultivation, adulteration detection, active constituents and medical uses of the following medicinal roots and rhizomes :Liquorice,Ipecacuanha,Rauwolfia,Senega,Ginger,Colchicum,Squill,Ginseng,Rhubarb,Curcuma,Podophyllum,Aconite,Vera trum,Sasaparilla,Kava-kava	2	4
<b>Course Review</b>		a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Intended Learning Outcomes CILOs</b>
1.	preparation of hard parts of plant(e.g. roots, seeds), for investigation : drying, grinding, treating with reagents , etc	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
2.	preparation of soft parts of plant(e.g. leaves, flowers), for investigation : drying, grinding, treating with reagents , etc	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
3.	microscopical Detection of types of calcium oxalate in plant	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
4.	microscopical Detection of types of starch in plant	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
5.	morphology and microscopical determination of medicinal leaves : senna leaves	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
6.	morphology and microscopical determination of medicinal leaves : Henna leaves	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
7.	morphology and microscopical determination of medicinal barks : cinnamon bark	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
8.	morphology and microscopical determination of medicinal barks : pomegranate bark	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
9.	morphology and microscopical determination of medicinal roots & rhizomes: Ginger	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
10.	morphology and microscopical determination of medicinal roots & rhizomes: liquorice	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
11.	Review	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search on the pharmaceutical products available in the drug market of one plant drug studied in the course.	a2, c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to do search report for adulteration of one crude drug studied in the course.	b6, c5, c6, d1, d3, d5	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, a5, b2, b3, b4, b5
2	Assignments (1 + 2)	4-13, 14	5	5	c5, c6, d1, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a1, a2, a5, b2, b3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, a5, b2, b3, b4, b5
TOTAL			60	60 %	60

Practicalpart assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b6
6	Practical exam (practical)	14	20	20	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. W.C. Evans, Trease and Evans pharmacognosy, 2009, W.B.Saunders

### 2- Essential References.

1. Jarald. Colour atlas of medicinal plants
2. Bhandari. Textbook of pharmacognosy.
3. Gokhale. Practical pharmacognosy

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of PHARMACOGNOSY I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course provides the students with introduction to medicinal plants as an important natural source of drugs. Besides, the course deals with study of common medicinal leaves, barks, roots and rhizomes



III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A1	a1. Identify the botanical origin, morphological and microscopical characteristics of common medicinal leaves, barks, roots and rhizomes.
2.	A2	a2. Determine the active constituents and therapeutic use of common medicinal leaves, barks, roots and rhizomes.
3.	A3	a3. Discuss the principles and procedures applied for obtaining appropriate crude drugs from plants.
4.		a4. Explicit the methods used for detection of active constituents and discovering adulteration of medicinal plants.
5.	A4	a5. Comprehend his/her role as pharmacist in collection, detection, and rational therapeutic use of medicinal plants.
6.	B1	b1. Express with drawings the morphology and key microscopical features of medicinal plants
7.		b2. Differentiate between common medicinal leaves, barks, roots and rhizomes based on morphological and microscopical features.
8.	B2	b3. Classify active constituents in medicinal plants.
9.		b4. Compare between common medicinal leaves, barks, roots and rhizomes according to their botanical origin, plant parts, chemical structures and therapeutic use.
10.	B3	b5. Design a plan to obtain medicinal plants and crude drugs of high quality.
11.	B4	b6. Assess the quality of medicinal plants and crude drugs.
12.		b7. Select the appropriate day time/season for cultivation of medicinal plants.
13.	C1	c1. Handle efficiently the tools and chemicals used in pharmacognosy and phytochemistry Lab.
14.		c2. Operate successfully the instruments used in pharmacognosy and phytochemistry Lab.
15.	C2	c3. Perform effectively using standard procedures the practical works in pharmacognosy and phytochemistry Lab including preparation of medicinal crude drug samples for microscopical investigation and detection the active constituents and key-microscopical elements.
16.	C3	c4. Take the required safety criteria during performing different types of

		pharmacy works
17.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
18.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1. Share successfully in team-work.
20.	D2	d2. Show respect to life.
21.	D3	d3. Communicate effectively with his/her colleagues.
22.	D4	d4.Behave in discipline during practicing practical and professional works and assignments.
23.	D5	d5. Demonstrate time management and self-learning during performing practical works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	laboratory practice, lab. practice	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam)
a2	Lecture	Written exam , Attendance
a3, a4	Lecture	Written exam , Attendance
a5	lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
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b1, b2	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3, b4	Lecture	Written exam , Attendance
b5	Lecture	Written exam , Attendance
b7	Lecture	Written exam , Attendance
b6	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)

**(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	Feed-back learning , Group-project	Assignments
c6	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam) , Assignments

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a3, a4, a5, b5,b6, b7, d2	<ul style="list-style-type: none"> <li><input type="checkbox"/> Definition, importance, and function, brief history</li> <li><input type="checkbox"/> Crude, official and unofficial drugs.</li> <li><input type="checkbox"/> Nomenclature of crude drugs (botanical, geographical and commercial sources of drugs)</li> <li><input type="checkbox"/> Classification of crude drugs (alphabetical, taxonomical, morphological, pharmacological and chemical)</li> <li><input type="checkbox"/> Cultivation (Disadvantages of collecting wild plants and advantages of cultivation, factors affecting cultivation).</li> <li><input type="checkbox"/> Collection (Time of the year, time of the day, stage of the development of the plant and general rules of collection).</li> <li><input type="checkbox"/> Post-collection processing of crude drugs: Drying(Natural methods, artificial methods, changes occurring after drying), Preservation and protection of crude drugs(deterioration during storage, physicochemical factors, biological factors, methods to destroy and control of insects)</li> <li><input type="checkbox"/> Adulteration(sophistication, substitution, admixture and deterioration, determination of adulteration.)</li> </ul>	4	8
2	<b>Natural Chemical constituents in plants</b>	a2, a4, a5	Types , biological and pharmaceutical and therapeutic roles of : starch, proteins, fixed oils and fats, terpenes, etc., gums, mucilage, resins, tannins ,alkaloids, volatile oils and glycosides etc.	2	4
<b>MID-TERM EXAM</b>				1	2

3	<b>Medicinal leaves</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, cultivation, adulteration detection, active constituents and medical uses of the following medicinal leaves: Digitalis, Senna, Stramonium, Belladonna, Hyoscymus, Bucho, Boldo , Coca, Jaborandi, Henna.	3	6
4	<b>Medicinal barks</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, cultivation, adulteration detection, active constituents and medical uses of the following medicinal barks:Cinchona, Cinnamon, Frangula, Quillaia, Pomegranate, Hamamelis and Galls.	2	4
5	<b>Medicinal roots and rhizomes</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, cultivation, adulteration detection, active constituents and medical uses of the following medicinal roots and rhizomes : Liquorice,Ipecacuanha,Rauwolfia,Senega ,Ginger,Colchicum,Squill,Ginseng,Rhubarb,Curcuma,Podophyllum,Aconite,Veratrum,Sasaparilla,Kava-kava	2	4
<b>Course Review</b>		a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
1.	preparation of hard parts of plant(e.g. roots, seeds), for investigation : drying, grinding, treating with reagents , etc	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
2.	preparation of soft parts of plant(e.g. leaves, flowers), for investigation : drying, grinding, treating with reagents , etc	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
3.	microscopical Detection of types of calcium oxalate in plant	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
4.	microscopical Detection of types of starch in plant	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
5.	morphology and microscopical determination of medicinal leaves : senna leaves	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
6.	morphology and microscopical determination of medicinal leaves : Henna leaves	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
7.	morphology and microscopical determination of medicinal barks : cinnamon bark	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
8.	morphology and microscopical determination of medicinal barks : cinnamon bark	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
9.	morphology and microscopical determination of medicinal roots & rhizomes: Ginger	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
10.	morphology and microscopical determination of medicinal roots & rhizomes: liquorice	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
11.	Review	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to</b>	

		<b>12 credit hours</b>	
<b>Number of Weeks</b>		<b>12</b>	

## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Laboratory practice**: students doing experiments in labs individually or in small groups
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search on the pharmaceutical products available in the drug market of one plant drug studied in the course.	a2, c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to do search report for adulteration of one crude drug studied in the course.	b6, c5, c6, d1, d3, d5	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, a5, b2, b3, b4, b5
2	Assignments (1 + 2)	4-13, 14	5	5	c5, c6, d1, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a1, a2, a5, b2, b3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, a5, b2, b3, b4, b5
TOTAL			60	60 %	60

Practicalpart assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b6
6	Practical exam (practical)	14	20	20	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
Total			40	40 %	



## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. W.C. Evans, Trease and Evans pharmacognosy, 2009, W.B.Saunders
<b>2- Essential References.</b>
1. Jarald. Colour atlas of medicinal plants 2. Bhandari. Textbook of pharmacognosy. 3. Gokhale. Practical pharmacognosy
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PHARMACEUTICAL ANALYTICAL CHEMISTRY

<b>I. Course Identification and General Information:</b>								
1.	Course Title:	PHARMACEUTICAL ANALYTICAL CHEMISTRY						
2.	Course Code & Number:	PHRM 04						
3.	Credit hours:	C.H			TOTAL	4		
		Theoretical					P.	Tr.
		L.	Tut.	S.				
		2	1	-			1	-
4.	Study level/ semester at which this course is offered:	( SECOND ) Year – ( 2 <sup>ND</sup> ) semester						
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General chemistry</li> <li>Pharmaceutical calculation skills</li> </ul>						
6.	Co –requisite (if any):	none						
7.	Program (s) in which the course is offered:	All BC programs offered by the university						
8.	Language of teaching the course:	ENGLISH						
9.	Location of teaching the course:	IN THE UNIVERSITY						
10	Prepared By:							
11	Date of Approval	<b>10/2014</b>						

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of essential principles of analytical chemistry applied in pharmaceutical analysis. Although the course concerns mainly with titrimetric analysis, it provides also an introduction to analytical techniques that will be studied in details in " pharmaceutical instrumental analysis" courses.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A3	a1. Define analysis and demonstrate its purposes and types (quantitative, qualitative) and the validation criteria including average, standard deviation, accuracy, precision and calibration.
2.		a2. Discuss the chemical principles and pharmaceutical applications of titrimetric analysis.
3.	A4	a3. Comprehend his/her role as pharmacist in perform accurate and precise quantitative and qualitative analysis of materials.
4.	B1	b1. Interpret data obtained after quantitative titrimetric analysis.
5.	B2	b2. Calculate the content % of a material in a sample using titrimetric analysis and solve the related problems.
6.		b3 . Classify analytical techniques into quantitative/qualitative and to manual /instrumental and categorize titrimetric analysis based on principle reactions.
7.		b4. Compare between various types of titrimetric analysis.
8.	B4	b5 . Assess the validation of a titrimetric analysis.
9.		b6. Select the appropriate titrimetric analysis method for quantitation of materials
10.	C1	c1. Handle efficiently the tools and chemicals used in chemistry Lab.
11.		c2. Operate successfully the instruments used in chemistry Lab.
12.	C2	c3 . Perform effectively titrimetric analysis of materials using standard procedures and avoiding the source of errors.
13.	C3	c4 .Take the required safety criteria during performing practical works in chemistry Lab.
14.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
15.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
16.	D1	d1. Share successfully in team-work.
17.	D3	d2. Communicate effectively with his/her colleagues.
18.	D4	d3. behave in discipline during practicing pharmacy works.
19.	D5	d4. Demonstrate time management and self-learning during performing practical works and assignments.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a7, a8	Lecture	Written exam , Attendance
a9	Lecture, laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b3	lecture, Lecture-discussion laboratory practice, Feed-back learning	Written exam , Attendance, assignment , Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), quizzes
b4	Lecture-discussion, laboratory practice Feed-back learning	Written exam , Attendance, assignment , Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam) , quizzes
b5, b6	Lecture, lab.practice	Written exam , Attendance, Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b10, b11	Lecture, lecture-discussion, laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning	Teaching strategies	Assessment Strategies

Outcomes		
c1, c2, c3, c6	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c7	feed-back learning, Group-project	Assignments
c8	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam), Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam), Assignments
d5	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam), Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to analytical chemistry &amp; analytical techniques</b>	a1,a3, b1, b2,b3,b4, b6	<ul style="list-style-type: none"> <li>• Definitions, brief history, scope of applications</li> <li>• Quantitative and qualitative analysis (purposes , types)</li> <li>• Validation of analysis               <ul style="list-style-type: none"> <li>○ Source of errors</li> <li>○ Sampling procedures.</li> <li>○ calibration of analytical equipment</li> <li>○ preparation of standard solutions and calibration curve</li> <li>○ Analyzing of results : average, SD, coefficient of variation (CV%), accuracy , precision</li> <li>○ Significant numbers, rejection of doubtful values</li> </ul> </li> <li>• Manual versus instrumental analytical techniques: types, advantages , disadvantages.</li> <li>• Types &amp; comparison of titrimetric analysis</li> </ul>	4	12
2	<b>Aqueous Acid Base Titration</b>	a2,a3, b1, b2,b6	<ul style="list-style-type: none"> <li>• Definitions</li> <li>• Distribution of acid-base species with pH of the medium.</li> <li>• Acid-Base titrimetry for determination of weakly acidic and basic drugs.</li> <li>• Indicators (theories) and their selection</li> <li>• applications</li> </ul>	2	6
<b>MID-TERM EXAM</b>				1	2
3	<b>Non-Aqueous Acid Base Titrimetry 10</b>	a2,a3, b1, b2,b6	<ul style="list-style-type: none"> <li>• Theoretical considerations and principles.</li> <li>• Bronsted Lowery of acids and bases.</li> <li>• Non-aqueous solvents.</li> </ul>	3	9

			<ul style="list-style-type: none"> <li>• Titration of weak acids and weak bases.</li> <li>• Applications and scope of non-aqueous titrations.</li> </ul>		
4	<b>Oxidation Reduction Titration</b>	a2,a3, b1, b2,b6	<ul style="list-style-type: none"> <li>• Principles and concepts, determination involving oxidizing agents</li> <li>• iodimetric and iodometric determination, miscellaneous oxidation and reduction titrations. Indicators</li> <li>• applications.</li> <li>• chromometric determination, miscellaneous oxidation</li> </ul>	2	6
5	<b>Complexometric Titration</b>	a2,a3, b1, b2,b6	<ul style="list-style-type: none"> <li>• Principle, Complexes and chelates, stability of complex ions.</li> <li>• Types of Complexometric titrations. Technique employed in complexometric titration, End point detection</li> </ul>	2	6
<b>Course Review</b>		a1, a2,a9, b3, b4,b6	a2,a3, b1, b2	1	3
FINAL - EXAM				1	2
<b>TOTAL</b>				16	46
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Intended Learning Outcomes CILOs</b>
1.	introduction to the Lab.: safety requirements, list of experiments, How to report, source of errors, etc	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
2.	aqueous titration of weak acids e.g. acetic acid	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
3.	aqueous titration of weak acids e.g. citric acid	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
4.	aqueous titration of weak bases e.g. ammonium chloride	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
5.	non-aqueous titration of weak acids e.g. salicylic acid	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
6.	non-aqueous titration of weak bases	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
7.	Oxidation/reduction titration (iodometry) ; titration of H <sub>2</sub> O <sub>2</sub> using iodine	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
8.	Oxidation/reduction titration (chromometry) ; titration of iron using potassium dichromate	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
9.	titration (chromometry) ; titration of methanol using potassium dichromate	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
10.	Compleximetric titration of calcium salt	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
11.	Compleximetric titration of magnesium salt	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
PRACTICAL EXAM		1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**lecture - Discussion**: a short lecture/ address followed by discussion

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provides the students with problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b2, c6, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to do a search report on pharmaceutical applications of one method of the studied titrimetric analysis.	c5, c6, d1, d2, d4	14	2

## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1,a3, b2, b1, b2,b3,b4,b6
2	Assignments (1 + 2)	4-13, 14	5	5	b2,c5, c6, d1, d2, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b2
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1,a3, b2, b1, b2,b3,b4,b6
5	Final exam of theoretical part ( written exam)	17	40	40	a1,a3, b2, b1, b2,b3,b4,b6
TOTAL			60	60 %	60

### Practicalpart assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
2	Lab. Attitude	weekly	2	2	d1, d2, d3,d4
3	Lab. Accomplishments	weekly	5	5	b5, c1, c2, c3,c4, c6, d4
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b5, c1, c2, c3,c4, c6, d4
6	Practical exam (practical)	14	20	20	b5, c1, c2, c3,c4, c6, d4
Total			40	40 %	

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Gary G. Christian, analytical chemistry, 2004, John Wiley & sons
<b>2- Essential References.</b>
1. Leslie G Chatten: Deans analytical chemistry handbook, 2003, McGraw Hill
2. Verma. Analytical chemistry
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of

### Pharmaceutical analytical chemistry

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
<p>The course deals with the study of essential principles of analytical chemistry applied in pharmaceutical analysis. Although the course concerns mainly with titrimetric analysis, it provides also an introduction to analytical techniques that will be studied in details in " pharmaceutical instrumental analysis" courses.</p>

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A3	a1. Define analysis and demonstrate its purposes and types (quantitative, qualitative) and the validation criteria including average, standard deviation, accuracy, precision and calibration.
2.		a2. Discuss the chemical principles and pharmaceutical applications of titrimetric analysis.
3.	A4	a3. Comprehend his/her role as pharmacist in perform accurate and precise quantitative and qualitative analysis of materials.
4.	B1	b1. Interpret data obtained after quantitative titrimetric analysis.
5.	B2	b2. Calculate the content % of a material in a sample using titrimetric analysis and solve the related problems.
6.		b3 . Classify analytical techniques into quantitative/qualitative and to manual /instrumental and categorize titrimetric analysis based on principle reactions.
7.		b4. Compare between various types of titrimetric analysis.
8.	B4	b5 . Assess the validation of a titrimetric analysis.
9.		b6. Select the appropriate titrimetric analysis method for quantitation of materials
10.	C1	c1.Handle efficiently the tools and chemicals used in chemistry Lab.
11.		c2. Operate successfully the instruments used in chemistry Lab.
12.	C2	c3 . Perform effectively titrimetric analysis of materials using standard procedures and avoiding the source of errors.
13.	C3	c4 .Take the required safety criteria during performing practical works in chemistry Lab.
14.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
15.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
16.	D1	d1. Share successfully in team-work.
17.	D3	d2. Communicate effectively with his/her colleagues.
18.	D4	d3. behave in discipline during practicing pharmacy works.
19.	D5	d4. Demonstrate time management and self-learning during performing practical works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a7, a8	Lecture	Written exam , Attendance
a9	Lecture, laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b3	lecture, Lecture-discussion laboratory practice, Feed-back learning	Written exam , Attendance, assignment , Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), quizzes
b4	Lecture-discussion, laboratory practice Feed-back learning	Written exam , Attendance, assignment , Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam) , quizzes
b5, b6	Lecture, lab. practice	Written exam , Attendance, Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b10, b11	Lecture, lecture-discussion, laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning	Teaching strategies	Assessment Strategies
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Outcomes		
c1, c2, c3, c6	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c7	feed-back learning, Group-project	Assignments
c8	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam), Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam), Assignments
d5	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam), Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to analytical chemistry and analytical techniques</b>	a1,a3, b1, b2,b3,b4, b6	<ul style="list-style-type: none"> <li>• Definitions, brief history, scope of applications</li> <li>• Quantitative and qualitative analysis (purposes , types)</li> <li>• Validation of analysis               <ul style="list-style-type: none"> <li>○ Source of errors</li> <li>○ Sampling procedures.</li> <li>○ calibration of analytical equipment</li> <li>○ preparation of standard solutions and calibration curve</li> <li>○ Analyzing of results : average, SD, coefficient of variation (CV%), accuracy , precision</li> <li>○ Significant numbers, rejection of doubtful values</li> </ul> </li> <li>• Manual versus instrumental analytical techniques: types, advantages , disadvantages.</li> <li>• Types &amp; comparison of titrimetric analysis</li> </ul>	4	12
2	<b>Aqueous Acid Base Titration</b>	a2,a3, b1, b2,b6	<ul style="list-style-type: none"> <li>• Definitions</li> <li>• Distribution of acid-base species with pH of the medium.</li> <li>• Acid-Base titrimetry for determination of weakly acidic and basic drugs.</li> <li>• Indicators (theories) and their selection</li> <li>• applications</li> </ul>	2	6
<b>MID-TERM EXAM</b>				1	2
3	<b>Non-Aqueous Acid Base Titrimetry</b>	a2,a3, b1, b2,b6	<ul style="list-style-type: none"> <li>• Theoretical considerations and principles.</li> <li>• Bronsted Lowery of acids and bases.</li> <li>• Non-aqueous solvents.</li> <li>• Titration of weak acids and weak bases.</li> </ul>	3	9



			<ul style="list-style-type: none"> <li>• Applications and scope of non-aqueous titrations.</li> </ul>		
4	<b>Oxidation Reduction Titration</b>	a2,a3, b1, b2,b6	<ul style="list-style-type: none"> <li>• Principles and concepts, determination involving oxidizing agents</li> <li>• iodimetric and iodometric determination, miscellaneous oxidation and reduction titrations. Indicators</li> <li>• applications.</li> <li>• chromometric determination, miscellaneous oxidation</li> </ul>	2	6
5	<b>Complexometric Titration</b>	a2,a3, b1, b2,b6	<ul style="list-style-type: none"> <li>• Principle, Complexes and chelates, stability of complex ions.</li> <li>• Types of Complexometric titrations. Technique employed in complexometric titration, End point detection</li> </ul>	2	6
	<b>Course Review</b>	a1, a2,a9, b3, b4,b6	a2,a3, b1, b2	1	3
FINAL - EXAM				1	2
<b>TOTAL</b>				16	46
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Intended Learning Outcomes CLOs</b>
12.	introduction to the Lab.: safety requirements, list of experiments, How to report, source of errors, etc	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
13.	aqueous titration of weak acids e.g. acetic acid	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
14.	aqueous titration of weak acids e.g. citric acid	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
15.	aqueous titration of weak bases e.g. ammonium chloride	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
16.	non-aqueous titration of weak acids e.g. salicylic acid	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
17.	non-aqueous titration of weak bases	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
18.	Oxidation/reduction titration (iodometry) ; titration of H <sub>2</sub> O <sub>2</sub> using iodine	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
19.	Oxidation/reduction titration (chromometry) ; titration of iron using potassium dichromate	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
20.	titration (chromometry) ; titration of methanol using potassium dichromate	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
21.	Compleximetric titration of calcium salt	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
22.	Compleximetric titration of magnesium salt	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
PRACTICAL EXAM		1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.

The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**lecture - Discussion**: a short lecture/ address followed by discussion

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provides the students with problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b2, c6, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to do a search report on pharmaceutical applications of one method of the studied titrimetric analysis.	c5, c6, d1, d2, d4	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1,a3, b2, b1, b2,b3,b4,b6
2	Assignments (1 + 2)	4, 14	5	5	b2,c5, c6, d1, d2, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b2
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1,a3, b2, b1, b2,b3,b4,b6
5	Final exam of theoretical part ( written exam)	17	40	40	a1,a3, b2, b1, b2,b3,b4,b6
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
2	Lab. Attitude	weekly	2	2	d1, d2, d3,d4
3	Lab. Accomplishments	weekly	5	5	b5, c1, c2, c3,c4, c6, d4
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b5, c1, c2, c3,c4, c6, d4
6	Practical exam (practical)	14	20	20	b5, c1, c2, c3,c4, c6, d4
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Gary G. Christian, analytical chemistry, 2004, John Wiley & sons

### 2- Essential References.

1. Leslie G Chatten: Deans analytical chemistry handbook, 2003, McGraw Hill
2. Verma. Analytical chemistry

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

Medical sciences college  
 Department: Pharmacy  
 Title of the Program: **PHARMACY BACHELOR**

## Course Specification

### PHARMACOLOGY II

<b>I. Course Identification and General Information:</b>					
1.	Course Title:	PHARMACOLOGY II			
2.	Course Code & Number:	PHRC 04			
3.	Credit hours:	C.H			TOTAL
		Theoretical		P.	
		L.	Tut.		
		3	-	-	-
4.	Study level/ semester at which this course is offered:	( <i>THIRD</i> ) Year – (1 <sup>ST</sup> ) semester			
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>• General biology</li> <li>• Anatomy and histology</li> <li>• Physiology I, II</li> <li>• Pathology</li> <li>• Pharmacology I</li> </ul>			
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>• Medicinal chemistry II</li> <li>• Pathophysiology</li> </ul>			
7.	Program (s) in which the course is offered:	All BC programs offered by the university			
8.	Language of teaching the course:	ENGLISH			
9.	Location of teaching the course:	IN THE UNIVERSITY			
10	Prepared By:				
11	Date of Approval	<b>10/2014</b>			

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course also deals with the study of pharmacodynamic and pharmacokinetics of drugs used for respiratory, cardiovascular systems , blood and endocrine glands disorders as well as analgesic drugs.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Determine pharmacokinetics (absorption, distribution, metabolism and excretion) and drug benefits (therapeutic actions, indications, efficacy and potency) & drug posology of drugs used for respiratory, cardiovascular systems , blood and endocrine glands disorders as well as analgesic drugs.
2.		a2. Discuss drug limitations (side effects, contraindications, precautions, use in special patent categories and drug interactions) of drugs used for respiratory, cardiovascular systems , blood and endocrine glands disorders as well as analgesic drugs.
3.	A3	a3. Comprehend his/her role as a pharmacist in providing correct information on rational use of medications.
4.	B2	b1 .Classify drugs affecting adugs used for respiratory, cardiovascular systems , blood and endocrine glands disorders as well as analgesic drugs into various categories .
5.		b2. Compare between therapeutically related drugs based on drug benefits ( in particular efficacy and potency)and drug limitations.
6.		b3. Relate drug indications to MAO of drugs.
7.	B3	b4. Predict drug limitations on the basis of Drug MOA.
8.	B4	b5. Select an appropriate drug for patients based on drug benefits and limitation.
9.	C1	c1. Provide correct information on drug benefits and limitation.
10.	C2	c2 .Search efficiently for information using documented and electronic sources of information.
11.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
12.	D1	d1. Share successfully in team-work.
13.	D2	d2. Show respect to life.
14.	D3	d3. Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
a1, a2	Lecture	Written exam , Attendance
a3	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
b1, b2, b3	Lecture	Written exam , Attendance, quizzes
b4	Lecture	Written exam , Attendance
b5	Lecture	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1	lecture, feed-back learning	written exam, attendance, assignment
c2	feed-back learning, Group-project	Assignments
c3	laboratory practice	Practical assessment (Lab. attendance, reporting, practical exam)
c3	Feed-back learning Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d3	Feed-back learning	Assignments



IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	Drugs acting on respiratory system	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Drugs for common cold : nasal decongestant , antihistmines</li> <li>• Drugs for cough</li> <li>• Drugs for bronchial asthma</li> </ul>	1	3
2	Cardiovascular system drugs	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Diuretics and Antihypertensive</li> <li>• Hypertensives</li> <li>• Antianginal and drugs for myocardial infarction</li> <li>• Drugs for congestive heart failure</li> <li>• antiarrhythmics</li> </ul>	3	9
3	Drugs for blood disorders	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Haematinics (antianaemic drugs)</li> <li>• Antihemorrhagic drugs</li> <li>• Anticoagulants</li> </ul>	2	6
MID-TERM EXAM				1	2
4	Drugs for endocrine glands disorders	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Anterior and posterior pituitary hormones</li> <li>• Drugs for thyroid gland disorders</li> <li>• Antidiabetic drugs: insulin, oral hypoglycemics</li> <li>• Corticosteroids</li> </ul>	4	12

			<ul style="list-style-type: none"> <li>Estrogens, progesterons, hormonal contraceptives and antiestrogens</li> <li>Androgens and antiandrogens</li> </ul>		
5	<b>Analgesics</b>	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>Narcotic analgesics</li> <li>Non-narcotic analgesic antipyretic drugs with weak or no anti-inflammatory effect : paracetamol</li> <li>Non-narcotic Analgesic and antipyretic with anti-inflammatory effect " Non-steroidal anti-inflammatory drugs (NSAIDs): salicylates, fenamates, propionic acid derivatives, acetic acid derivatives, oxicams, newer NSAIDs (ketoprolac, etc)</li> <li>AntiCOX II NSAIDs (etodalac, meloxicam, coxibs, etc)</li> </ul>	3	9
	<b>Course Review</b>	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	Review of the course topics by discussion session.	1	3
<b>FINAL - EXAM</b>				1	3
<b>TOTAL</b>				16	47
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to prepare an index booklet of the drugs studied in the course. The index should contain the basic drug information on drug benefits and limitation.	c2, c3, d3	13	6
2	<b>Group :</b> each group of students will be assigned to provide a comparison chart on drugs of the same pharmacologic category. Comparison focuses on drug benefits and limitations.	b2, c2, c3, d1, d3	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2
2	Assignments (1 + 2)	4, 14	10	10	b2, c2, c3, d1, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b3
4	Mid-semester exam of theoretical part (written exam)	7	20	20	, a3, b2, b3, b4, b5, c1, d2
5	Final exam of theoretical part (written exam)	17	60	60	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Katzung –Basic and Clinical Pharmacology, (2007), McGraw-Hill
2. Rang, Dale and Ritter. Pharmacology, (2007), Churchill Livingstone.

### 2- Essential References.

1. Richard A. Harvey. Lippincott's pharmacology, 2000, Lippincott William and Wilkins.
2. Udaykumar. Text book of medical pharmacology

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

**Medical sciences college**

Department: pharmacy

**Title of the Program: PHARMACY BACHELOR**

**Course Plan (Syllabus) of PHARMACOLOGY II**

<b>I. - Information about Faculty Member Responsible for the Course:</b>							
<b>Name of Faculty Member</b>		<b>Office Hours</b>					
<b>Location &amp; Telephone No.</b>	Pharmacy department	<b>SAT</b>	<b>SUN</b>	<b>MON</b>	<b>TUE</b>	<b>WED</b>	<b>THU</b>
<b>E-mail</b>							

<b>II. Course Description:</b>
The course also deals with the study of pharmacodynamic and pharmacokinetics of drugs used for respiratory, cardiovascular systems, blood and endocrine glands disorders as well as analgesic drugs.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

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3.	A3	a3. Comprehend his/her role as a pharmacist in providing correct information on rational use of medications.
4.	B2	b1 .Classify drugs affecting adrugs used for respiratory, cardiovascular systems , blood and endocrine glands disorders as well as analgesic drugs into various categories .
5.		b2. Compare between therapeutically related drugs based on drug benefits ( in particular efficacy and potency)and drug limitations.
6.		b3. Relate drug indications to MAO of drugs.
7.	B3	b4. Predict drug limitations on the basis of Drug MOA.
8.	B4	b5. Select an appropriate drug for patients based on drug benefits and limitation.
9.	C1	c1. Provide correct information on drug benefits and limitation.
10.	C2	c2 .Search efficiently for information using documented and electronic sources of information.
11.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
12.	D1	d1. Share successfully in team-work.
13.	D2	d2. Show respect to life.
14.	D3	d3. Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
a1, a2	Lecture	Written exam , Attendance
a3	Lecture	Written exam , Attendance
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<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
b1, b2, b3	Lecture	Written exam , Attendance, quizzes
b4	Lecture	Written exam , Attendance
b5	Lecture	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1	lecture, feed-back learning	written exam, attendance, assignment
c2	feed-back learning, Group-project	Assignments
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<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d3	Feed-back learning	Assignments

V. Course Content:					
A – Theoretical Aspect:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	Drugs acting on respiratory system	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Drugs for common cold : nasal decongestant , antihistmines</li> <li>• Drugs for cough</li> <li>• Drugs for bronchial asthma</li> </ul>	1	3
2	Cardiovascular system drugs	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Diuretics and Antihypertensive</li> <li>• Hypertensives</li> <li>• Antianginal and drugs for myocardial infarction</li> <li>• Drugs for congestive heart failure</li> <li>• antiarrhythmics</li> </ul>	3	9
3	Drugs for blood disorders	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Haematinics (antianaemic drugs)</li> <li>• Antihemorrhagic drugs</li> <li>• Anticoagulants</li> </ul>	2	6
MID-TERM EXAM				1	2
4	Drugs for endocrine glands disorders	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Anterior and posterior pituitary hormones</li> <li>• Drugs for thyroid gland disorders</li> <li>• Antidiabetic drugs: insulin, oral hypoglycemics</li> <li>• Corticosteroids</li> </ul>	4	12



			<ul style="list-style-type: none"> <li>• Estrogens, progesterons, hormonal contraceptives and antiestrogens</li> <li>• Androgens and antiandrogens</li> </ul>		
5	<b>Analgesics</b>	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Narcotic analgesics</li> <li>• Non-narcotic analgesic antipyretic drugs with weak or no anti-inflammatory effect : paracetamol</li> <li>• Non-narcotic Analgesic and antipyretic with anti-inflammatory effect " Non-steroidal anti-inflammatory drugs (NSAIDs): salicylates, fenamates, propionic acid derivatives, acetic acid derivatives, oxicams, newer NSAIDs (ketoprolac, etc)</li> <li>• AntiCOX II NSAIDs (etodalac, meloxicam, coxibs, etc</li> </ul>	3	9
	<b>Course Review</b>	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	Review of the course topics by discussion session.	1	3
<b>FINAL - EXAM</b>				1	3
<b>TOTAL</b>				16	47
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.

The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

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## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to prepare an index booklet of the drugs studied in the course. The index should contain the basic drug information on drug benefits and limitation.	c2, c3, d3	13	6
2	<b>Group :</b> each group of students will be assigned to provide a comparison chart on drugs of the same pharmacologic category. Comparison focuses on drug benefits and limitations.	b2, c2, c3, d1, d3	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2
2	Assignments (1 + 2)	4, 14	10	10	b2, c2, c3, d1, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b3
4	Mid-semester exam of theoretical part (written exam)	7	20	20	, a3, b2, b3, b4, b5, c1, d2
5	Final exam of theoretical part (written exam)	17	60	60	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Katzung –Basic and Clinical Pharmacology, (2007), McGraw-Hill
2. Rang, Dale and Ritter. Pharmacology, (2007), Churchill Livingstone.

### 2- Essential References.

1. Richard A. Harvey. Lippincott's pharmacology, 2000, Lippincott William and Wilkins.
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### 3- Electronic Materials and Web Sites etc.

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## IX. Course Policies:

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## Course Specification

### MEDICINAL CHEMSITRY II

<b>I. Course Identification and General Information:</b>						
1.	Course Title:	MEDICINAL CHEMSITRY II				
2.	Course Code & Number:	PHRM 06				
3.	Credit hours:	C.H			TOTAL	
		Theoretical		P.		Tr.
		L.	Tut.			
		3	-	-		1
4.	Study level/ semester at which this course is offered:	<i>( THIRD ) Year – ( 1<sup>ST</sup> ) semester</i>				
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General chemistry</li> <li>Organic chemistry</li> <li>Pharmaceutical organic chemistry</li> <li>Medicinal chemistry I</li> </ul>				
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>Pharmacology II</li> </ul>				
7.	Program (s) in which the course is offered:	All BC programs offered by the university				
8.	Language of teaching the course:	ENGLISH				
9.	Location of teaching the course:	IN THE UNIVERSITY				
10	Prepared By:					
11	Date of Approval	<b>10/2014</b>				

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course deals with the study of synthesis, structure activity relationship (SAR), and metabolism of drugs used for respiratory, cardiovascular systems, blood and endocrine glands disorders as well as analgesic drugs.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	<b>A2</b>	<b>a1.</b> Explain the correlation between the chemical properties of drugs and their synthesis, identification, biological activity (SAR) and metabolism
2.		<b>a2.</b> Determine physicochemical properties, synthesis, purification, structure-activity relationship, metabolism of drugs used for respiratory, cardiovascular systems, blood and endocrine glands disorders as well as analgesic drugs.
3.	<b>A4</b>	<b>a3.</b> Comprehend his/her role as a pharmacist in synthesis, designing and identification of drugs.
4.	<b>B1</b>	<b>b1.</b> Differentiate between chemically related drugs.
5.		<b>b2.</b> Interpret the chemical modification applied on parent drugs to produce newer drugs.
6.		<b>b3.</b> Solve chemical problems related to identification, reactions, metabolism of drugs used for respiratory, cardiovascular systems, blood and endocrine glands disorders as well as analgesic drugs.
7.	<b>B2</b>	<b>b4.</b> Classify drugs used for respiratory, cardiovascular systems, blood and endocrine glands disorders as well as analgesic drugs, chemically and therapeutically.
8.		<b>b5.</b> Compare between chemically related drugs based on their chemical structure and biological activity.
9.		<b>b6.</b> Relate biological activity of drugs to their chemical structure.
10.		<b>b7.</b> Design newer drugs from patent/parent drugs.
11.	<b>B3</b>	<b>b8.</b> Predict the outcomes of reactions, metabolism of drugs and chemical modification if occur in parent drugs..
12.	<b>B4</b>	<b>b9.</b> Assess the appropriateness of chemical modification present in newer drugs in comparison to parent drugs.
13.	<b>C1</b>	<b>c1.</b> Handle efficiently the tools and chemicals used in medicinal chemistry Lab.
14.		<b>c2.</b> Operate successfully the instruments used in medicinal chemistry Lab.
15.	<b>C2</b>	<b>c3.</b> Perform effectively the experiments, practical tasks and including drug synthesis, identification and purification of drugs using pharmacopeial procedures.

16.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.
17.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
18.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1. Share successfully in team-work.
20.	D2	d2. Show respect to life.
21.	D3	d3. Communicate effectively with his/her colleagues.
22.	D4	d4.Behave in discipline during practicing practical and professional works and assignments.
23.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

1. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
,	Lecture	Written exam , Attendance
a3	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture laboratory practice	Written exam , Attendance
		Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical

		exam)
b3	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b4, b5, b6, b7	Lecture	Written exam , Attendance, quizzes
b8	Lecture	Written exam , Attendance
b9	Lecture	Written exam , Attendance

**(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning , Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments

IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	Drugs acting on respiratory system	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Drugs for common cold : nasal decongestant , antihistmines</li> <li>• Drugs for cough</li> <li>• Drugs for bronchial asthma</li> </ul>	1	3
2	Cardiovascular system drugs	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Diuretics and Antihypertensive</li> <li>• Hypertensives</li> <li>• Antianginal and drugs for myocardial infarction</li> <li>• Drugs for congestive heart failure</li> <li>• antiarrhythmics</li> </ul>	3	9
3	Drugs for blood disorders	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Haematinics (antianemic drugs)</li> <li>• Antihemorrhagic drugs</li> <li>• Anticoagulants</li> </ul>	2	6
MID-TERM EXAM				1	2
4	Drugs for endocrine glands disorders	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Anterior and posterior pituitary hormones</li> <li>• Drugs for thyroid gland disorders</li> <li>• Antidiabetic drugs: insulin, oral hypoglycemics</li> <li>• Corticosteroids</li> <li>• Estrogens, progesterons, hormonal contraceptives and antiestrogens</li> <li>• Androgens and antiandrogens</li> </ul>	4	12
5	Analgesics	a1, a2,a3 ,	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity</b>	3	



		b1, b2, b3, b4, b5, b8, b9,d2	<b>relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Narcotic analgesics</li> <li>• Non-narcotic analgesic antipyretic drugs with weak or no anti-inflammatory effect : paracetamol</li> <li>• Non-narcotic Analgesic and antipyretic with anti-inflammatory effect " Non-steroidal anti-inflammatory drugs (NSAIDs): salicylates, fenamates, propionic acid derivatives, acetic acid derivatives, oxicams, newer NSAIDs (ketoprolac, etc)</li> <li>• AntiCOX II NSAIDs (etodalac, meloxicam, coxibs, etc</li> </ul>		9
<b>Course Review</b>		a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	Review of the course topics by discussion session.	1	3
<b>FINAL - EXAM</b>				1	3
<b>TOTAL</b>				16	47
<b>Number of Weeks /and Units Per Semester</b>				16 week s	5 Units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>AlignedCourse Intended Learning Outcomes CILOs</b>
1.	Pharmacopeial physicochemical properties , identification of: bronchodilators : aminophylline	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
2.	Pharmacopeial physicochemical properties , identification: Diuretics : Furosemide	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
3.	Pharmacopeial physicochemical properties , identification of : Antihypertensives : amlodipine	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
4.	Pharmacopeial physicochemical properties , identification of : anticoagulants : Warfarin	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
5.	pharmacopeial physicochemical properties , identification of : antidiabetics : Glibenclamide	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
6.	pharmacopeial physicochemical properties , identification of : antidiabetics : Glibenclamide	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
7.	pharmacopeial physicochemical properties , identification of : narcotic analgesics : codeine	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
8.	pharmacopeial physicochemical properties , identification of : NSAIDs : diclofenac sodium	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
9.	Synthesis of drugs	2	4	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
10.	Purification of drugs.	2	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
<b>PRACTICAL EXAM</b>		1	2	
<b>Total</b>		12	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with chemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b3, c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to hypothetically design newer drugs form a studied patent drug using SAR principles	b7, c5, c6, d1, d3, d5	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, , , a3,b1, b2, b3, b4, b5, b8, b9, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b3, b7, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	3	3	b3, b7
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, , , a3, b1, b2, b3,b5, b9
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, , a3,b1, b2, b3, b4, b5, b8, b9, d2
TOTAL			60	60 %	60

Practicalpart assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d5
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d5
6	Practical exam (practical)	14	20	20	a2,b1, b3, c1, c2, c3, c4, c6, d5
Total			40	40 %	

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
<ol style="list-style-type: none"> <li>1. Gareth Thomas, Medicinal chemistry: an introduction to, 2007 John Wiley &amp; Sons Ltd,</li> <li>2. Siddique. A textbook of medicinal chemistry</li> </ol>
<b>2- Essential References.</b>
<ol style="list-style-type: none"> <li>1. AshutochKar. Medicinal chemistry, 2007, New age international publisher</li> <li>2. Rajie. Pharmaceutical chemistry</li> <li>3. Wermuth. The practice of medicinal chemistry</li> </ol>
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of MEDICIANL CHEMISTRY II

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with the study of synthesis, structure activity relationship (SAR), and metabolism of drugs used for respiratory, cardiovascular systems, blood and endocrine glands disorders as well as analgesic drugs.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	<b>A2</b>	<b>a1.</b> Explain the correlation between the chemical properties of drugs and their synthesis, identification, biological activity (SAR) and metabolism
2.		<b>a2.</b> Determine physicochemical properties, synthesis, purification, structure-activity relationship, metabolism of drugs used for respiratory, cardiovascular systems, blood and endocrine glands disorders as well as analgesic drugs.
3.	<b>A4</b>	<b>a3.</b> Comprehend his/her role as a pharmacist in synthesis, designing and identification of drugs.
4.	<b>B1</b>	<b>b1.</b> Differentiate between chemically related drugs.
5.		<b>b2.</b> Interpret the chemical modification applied on parent drugs to produce newer drugs.
6.		<b>b3.</b> Solve chemical problems related to identification, reactions, metabolism of drugs used for respiratory, cardiovascular systems, blood and endocrine glands disorders as well as analgesic drugs.
7.	<b>B2</b>	<b>b4.</b> Classify drugs used for respiratory, cardiovascular systems, blood and endocrine glands disorders as well as analgesic drugs, chemically and therapeutically.
8.		<b>b5.</b> Compare between chemically related drugs based on their chemical structure and biological activity.
9.		<b>b6.</b> Relate biological activity of drugs to their chemical structure.
10.		<b>b7.</b> Design newer drugs from patent/parent drugs.
11.	<b>B3</b>	<b>b8.</b> Predict the outcomes of reactions, metabolism of drugs and chemical modification if occur in parent drugs..
12.	<b>B4</b>	<b>b9.</b> Assess the appropriateness of chemical modification present in newer drugs in comparison to parent drugs.
13.	<b>C1</b>	<b>c1.</b> Handle efficiently the tools and chemicals used in medicinal chemistry Lab.
14.		<b>c2.</b> Operate successfully the instruments used in medicinal chemistry Lab.
15.	<b>C2</b>	<b>c3.</b> Perform effectively the experiments, practical tasks and including drug synthesis, identification and purification of drugs using pharmacopeial procedures.

16.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.
17.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
18.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1. Share successfully in team-work.
20.	D2	d2. Show respect to life.
21.	D3	d3. Communicate effectively with his/her colleagues.
22.	D4	d4.Behave in discipline during practicing practical and professional works and assignments.
23.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

2. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
,	Lecture	Written exam , Attendance
a3	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture laboratory practice	Written exam , Attendance
		Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical



		exam)
b3	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b4, b5, b6, b7	Lecture	Written exam , Attendance, quizzes
b8	Lecture	Written exam , Attendance
b9	Lecture	Written exam , Attendance

**(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning , Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments

IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	Drugs acting on respiratory system	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Drugs for common cold : nasal decongestant , antihistmines</li> <li>• Drugs for cough</li> <li>• Drugs for bronchial asthma</li> </ul>	1	3
2	Cardiovascular system drugs	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Diuretics and Antihypertensive</li> <li>• Hypertensives</li> <li>• Antianginal and drugs for myocardial infarction</li> <li>• Drugs for congestive heart failure</li> <li>• antiarrhythmics</li> </ul>	3	9
3	Drugs for blood disorders	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Haematinics (antianemic drugs)</li> <li>• Anti-hemorrhagic drugs</li> <li>• Anticoagulants</li> </ul>	2	6
<b>MID-TERM EXAM</b>				1	2
4	Drugs for endocrine glands disorders	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Anterior and posterior pituitary hormones</li> <li>• Drugs for thyroid gland disorders</li> <li>• Antidiabetic drugs: insulin, oral hypoglycemics</li> <li>• Corticosteroids</li> <li>• Estrogens, progesterons, hormonal contraceptives and antiestrogens</li> <li>• Androgens and antiandrogens</li> </ul>	4	12
5	Analgesics	a1, a2,a3 ,	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-</b>	3	

		b1, b2, b3, b4, b5, b8, b9,d2	<b>activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Narcotic analgesics</li> <li>• Non-narcotic analgesic antipyretic drugs with weak or no anti-inflammatory effect : paracetamol</li> <li>• Non-narcotic Analgesic and antipyretic with anti-inflammatory effect " Non-steroidal anti-inflammatory drugs (NSAIDs): salicylates, fenamates, propionic acid derivatives, acetic acid derivatives, oxicams, newer NSAIDs (ketoprolac, etc)</li> <li>• AntiCOX II NSAIDs (etodalac, meloxicam, coxibs, etc</li> </ul>		9
<b>Course Review</b>		a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	Review of the course topics by discussion session.	1	3
<b>FINAL - EXAM</b>				1	3
<b>TOTAL</b>				16	47
<b>Number of Weeks /and Units Per Semester</b>				16 week s	5 Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs
1.	Pharmacopeial physicochemical properties , identification of: bronchodilators : aminophylline	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
2.	Pharmacopeial physicochemical properties , identification: Diuretics : Furosemide	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
3.	Pharmacopeial physicochemical properties , identification of : Antihypertensives : amlodipine	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
4.	Pharmacopeial physicochemical properties , identification of : anticoagulants : Warfarin	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
5.	pharmacopeial physicochemical properties , identification of : antidiabetics : Glibenclamide	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
6.	pharmacopeial physicochemical properties , identification of : antidiabetics : Glibenclamide	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
7.	pharmacopeial physicochemical properties , identification of : narcotic analgesics : codeine	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
8.	pharmacopeial physicochemical properties , identification of : NSAIDs : diclofenac sodium	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
9.	Synthesis of drugs	2	4	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
10.	Purification of drugs.	2	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.

The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with chemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b3, c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to hypothetically design newer drugs form a studied patent drug using SAR principles	b7, c5, c6, d1, d3, d5	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, , , a3,b1, b2, b3, b4, b5, b8, b9, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b3, b7, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	3	3	b3, b7
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, , , a3, b1, b2, b3,b5, b9
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, , , a3,b1, b2, b3, b4, b5, b8, b9, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d5
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d5
6	Practical exam (practical)	14	20	20	a2,b1, b3, c1, c2, c3, c4, c6, d5
Total			40	40 %	

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
<ol style="list-style-type: none"> <li>1. Gareth Thomas, Medicinal chemistry: an introduction to, 2007 John Wiley &amp; Sons Ltd,</li> <li>2. Siddique. A textbook of medicinal chemistry</li> </ol>
<b>2- Essential References.</b>
<ol style="list-style-type: none"> <li>1. AshutochKar. Medicinal chemistry, 2007, New age international publisher</li> <li>2. Rajie. Pharmaceutical chemistry</li> <li>3. Wermuth. The practice of medicinal chemistry</li> </ol>
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### MEDICAL PARASITOLOGY

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	MEDICAL PARASITOLOGY					
2.	Course Code & Number:	PHRE 02					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( <i>THIRD</i> ) Year – ( <i>1<sup>ST</sup></i> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General biology</li> <li>Pharmaceutical microbiology</li> </ul>					
6.	Co –requisite (if any):	none					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course deals with the study of pathogenic parasites commonly infecting humans. The study concerns with mode of infections, general characters, morphology, life cycle, pathogenesis, diagnosis, prevention and control of those parasites



<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	<b>A1</b>	<b>a1.</b> Identify and describe the microscopical/morphological features of common pathogenic parasites including protozoa , helminthes and arthropods.
2.		<b>a2.</b> Determine life cycle, pathogenicity, diagnosis, management of spread and treatment of common pathogenic parasites.
3.	<b>A2</b>	<b>a3.</b> Discuss the principles and technologies of parasitology applied for sampling and diagnosis of common pathogenic parasites infections
4.	<b>B1</b>	<b>b1.</b> Differentiate between similar parasites using morphological and microscopical techniques
5.	<b>B2</b>	<b>b2.</b> Classify pathogenic parasites.
6.		<b>b3.</b> Relate the severity of parasitic infections to its affecting factors such as immunity.
7.	<b>C1</b>	<b>c1.</b> Handle efficiently the tools and chemicals used in parasitology Lab.
8.		<b>c2.</b> Operate successfully the instruments used in parasitology Lab.
9.	<b>C2</b>	<b>c3.</b> Perform effectively the experiments and practical tasks in microbiology Lab. including microscopical investigation using standard procedures.
10.	<b>C3</b>	<b>c4.</b> Take the required safety criteria during performing different types of practical and professional pharmacy works
11.	<b>C4</b>	<b>c5.</b> Search efficiently for information using documented and electronic sources of information.
12.		<b>c6.</b> Present and report his/her works correctly using appropriate writing rules and technologies media.
13.	<b>D1</b>	<b>d1.</b> Share successfully in team-work.
14.	<b>D2</b>	<b>d2.</b> Show respect to life.
15.	<b>D3</b>	<b>d3.</b> Communicate effectively with his/her colleagues.
16.	<b>D4</b>	<b>d4.</b> Behave in discipline during practicing practical and professional works and assignments.
17.	<b>D5</b>	<b>d5.</b> Demonstrate time management and self-learning during performing practical and professional works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	laboratory practice, Lecture	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam), Written exam , Attendance
a2	Lecture	Written exam , Attendance
a3	Lecture	Written exam , Attendance, quizzes

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1,	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), quizzes
b3	Lecture	Written exam , Attendance

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam) Assignments

<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1, d3, d4</b>	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
<b>d2</b>	Lecture	Written exam , Attendance
<b>d5</b>	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments

IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to medical parasitology</b>	a1, a2, b1, b2, b3, d2	<input type="checkbox"/> Definition of parasitology <input type="checkbox"/> Types of parasite (Ecto, endo ,obligate ,facultative ) <input type="checkbox"/> Types of host(Mechanical and biological ) and Host parasites relationship <input type="checkbox"/> Effect of parasite on the host (Mechanical effect, effect on cell ,invasion and destruction ,inflammatory reaction to the parasite or production ,competition for host nutrient and toxic effect) <input type="checkbox"/> Types of vector (obligate ,facultative ) <input type="checkbox"/> Source of infection (food& drink, soil and water, vector ,direct contact and congenial) <input type="checkbox"/> Mode of infection <input type="checkbox"/> Classification of parasites (protozoa, helminthes , arthropods) classes and example for all class	4	8
2	<b>Techniques for sampling and detection of parasites -</b>	a3	<input type="checkbox"/> Type of specimens (urine, stool, blood, etc.) <input type="checkbox"/> Collection, transport and preservation of samples. <input type="checkbox"/> Microscopic examination <input type="checkbox"/> Direct Smear Method	1	2
3	<b>Protozoa (introduction + Amoeba)</b>	a1, a2, a3, b1, b2, b3, d2	General characteristic of protozoa(morphology, biological feature, multiplication ,nutrient, and locomotion ) <input type="checkbox"/> Classification (amoebae ,ciliate, flagellate, sporozoa) <input type="checkbox"/> Amoebae o Entamobeahistolytica ( Morphology ,life cycle, pathogenesis, Diagnosis, prevention and control) o Difference between	1	2

			Entamoeba histolytica and Entamoeba. Coli		
MID-TERM EXAM				1	2
3	<b>Protozoa</b> (Ciliate)		• Bantium coli ( Morphology ,life cycle, pathogenesis Diagnosis, prevention and control)	1	2
	<b>Protozoa</b> (intestinal and genital Flagellates)	a1, a2, a3, b1, b2, b3, d2	• Intestinal flagellates: Giardia lamblia ( Morphology ,life cycle, pathogenesis ,Diagnosis, prevention and control • Genital : Trichomonas vaginalis Morphology ,life cycle, pathogenesis ,Diagnosis, prevention and control	1	2
	<b>Protozoa</b> (blood Flagellates)	a1, a2, a3, b1, b2, b3, d2	• Leishmanias (Visceral and cutaneous) Morphology ,life cycle, pathogenesis ,Diagnosis, prevention and control) • Trypanosoma (all types Morphology ,life cycle, pathogenesis ,diagnosis, prevention and control	1	2
	<b>Protozoa</b> (Sporozoa)	a1, a2, a3, b1, b2, b3, d2	• Malaria parasites (Plasmodium falciparum, vivax, ovali , malareae ) Morphology ,life cycle, pathogenesis ,Diagnosis, prevention and control	1	2
4	<b>Helminthes</b>	a1, a2, a3, b1, b2, b3, d2	• Classification of helminthes (common worms (Nematodes), schistosoma, tape worms (Trematodes ), filariasis. • Morphology ,life cycle, pathogenesis, Diagnosis, prevention and control of helminthes from each class.	2	4
5	<b>Arthropods</b>	a1, a2, a3, b1, b2, b3, d2	• classification, morphology, life cycle, pathogenicity, prevention and treatment	1	2
<b>Course Review</b>		a1, a2, a3, b1, b2, b3, d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs
1.	investigation of Enatamopeahistolytica&Enatamope a coli	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
2.	investigation of Giardia	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
3.	investigation of Trichomonas	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
4.	investigation of Leishmania	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
5.	investigation of Malaria spp (with preparation of blood smear)	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
6.	investigation of Ascaris&Ancylostoma	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
7.	investigation of Teaniaspp	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
8.	investigation of H. nana	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
9.	investigation of schistosoma	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
10.	investigation of Arthropodes	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a summary report on one of the studied pathogenic parasite.	c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to make a letter of education to community about infection of one of the studied parasite.	c5, c6, d1, d3, d5	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, , b1, , b2, b3, , , d2
2	Assignments (1 + 2)	4-13, 14	5	5	c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	3	3	a3, b1
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2,a3, , b1, ,b2, b3 , d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, , b1, , b2, b3, , , d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a1, , b1, ,,c1, c2, c3, c4, c6, d5
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, b1, b1, , b3, ,
6	Practical exam (practical)	14	20	20	a1, , b1, ,,c1, c2, c3, c4, c6, d5
Total			40	40 %	



## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>	
1.	Kayser, Medical Microbiology & parasitology, 2005 Thieme
<b>2- Essential References.</b>	
1.	Michael j. Cuomo. Diagnosing medical parasites: a public health officers guide to assisting laboratory and medical officers, USAF
2.	Chatterjee. Parastology
3.	Parija. Text book of medical parastologyW. B. Hugo: pharmaceutical microbiology, 1998, Black well science LTD.
<b>3- Electronic Materials and Web Sites etc.</b>	
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>	

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of MEDICAL PARASITOLOGY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

III. Course Description:
<p>The course deals with the study of pathogenic parasites commonly infecting humans. The study concerns with mode of infections, general characters, morphology, life cycle, pathogenesis, diagnosis, prevention and control of those parasites</p>

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	<b>A1</b>	<b>a1.</b> Identify and describe the microscopical/morphological features of common pathogenic parasites including protozoa , helminthes and arthropods.
2.		<b>a2.</b> Determine life cycle, pathogenicity, diagnosis, management of spread and treatment of common pathogenic parasites.
3.	<b>A2</b>	<b>a3.</b> Discuss the principles and technologies of parasitology applied for sampling and diagnosis of common pathogenic parasites infections
4.	<b>B1</b>	<b>b1.</b> Differentiate between similar parasites using morphological and microscopical techniques
5.	<b>B2</b>	<b>b2.</b> Classify pathogenic parasites.
6.		<b>b3.</b> Relate the severity of parasitic infections to its affecting factors such as immunity.
7.	<b>C1</b>	<b>c1.</b> Handle efficiently the tools and chemicals used in parasitology Lab.
8.		<b>c2.</b> Operate successfully the instruments used in parasitology Lab.
9.	<b>C2</b>	<b>c3.</b> Perform effectively the experiments and practical tasks in microbiology Lab. including microscopical investigation using standard procedures.
10.	<b>C3</b>	<b>c4.</b> Take the required safety criteria during performing different types of practical and professional pharmacy works
11.	<b>C4</b>	<b>c5.</b> Search efficiently for information using documented and electronic sources of information.
12.		<b>c6.</b> Present and report his/her works correctly using appropriate writing rules and technologies media.
13.	<b>D1</b>	<b>d1.</b> Share successfully in team-work.
14.	<b>D2</b>	<b>d2.</b> Show respect to life.
15.	<b>D3</b>	<b>d3.</b> Communicate effectively with his/her colleagues.
16.	<b>D4</b>	<b>d4.</b> Behave in discipline during practicing practical and professional works and assignments.
17.	<b>D5</b>	<b>d5.</b> Demonstrate time management and self-learning during performing practical and professional works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	laboratory practice, Lecture	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam), Written exam , Attendance
a2	Lecture	Written exam , Attendance
a3	Lecture	Written exam , Attendance, quizzes

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1,	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), quizzes
b3	Lecture	Written exam , Attendance

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam) Assignments

<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1, d3, d4</b>	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
<b>d2</b>	Lecture	Written exam , Attendance
<b>d5</b>	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to medical parasitology</b>	a1, a2, b1, b2, b3, d2	<input type="checkbox"/> Definition of parasitology <input type="checkbox"/> Types of parasite (Ecto, endo, obligate, facultative) <input type="checkbox"/> Types of host (Mechanical and biological) and Host parasites relationship <input type="checkbox"/> Effect of parasite on the host (Mechanical effect, effect on cell, invasion and destruction, inflammatory reaction to the parasite or production, competition for host nutrient and toxic effect) <input type="checkbox"/> Types of vector (obligate, facultative) <input type="checkbox"/> Source of infection (food & drink, soil and water, vector, direct contact and congenial) <input type="checkbox"/> Mode of infection <input type="checkbox"/> Classification of parasites (protozoa, helminthes, arthropods) classes and example for all class	4	8
2	<b>Techniques for sampling and detection of parasites -</b>	a3	<input type="checkbox"/> Type of specimens (urine, stool, blood, etc.) <input type="checkbox"/> Collection, transport and preservation of samples. <input type="checkbox"/> Microscopic examination <input type="checkbox"/> Direct Smear Method	1	2
3	<b>Protozoa (introduction + Amoeba)</b>	a1, a2, a3, b1, b2, b3, d2	General characteristic of protozoa (morphology, biological feature, multiplication, nutrient, and locomotion) <input type="checkbox"/> Classification (amoebae, ciliate, flagellate, sporozoa) <input type="checkbox"/> Amoebae o Entamoeba histolytica (Morphology, life cycle, pathogenesis, Diagnosis, prevention and control) o Difference between	1	2

			Entamoebahistolytica and Entamoeba. coli		
MID-TERM EXAM				1	2
3	<b>Protozoa</b> (Ciliate)		• Bantium coli ( Morphology ,life cycle, pathogenesis Diagnosis, prevention and control)	1	2
	<b>Protozoa</b> (intestinal and genital Flagellates)	a1, a2, a3, b1, b2, b3, d2	• Intestinal flagellates: Giardia lamblia ( Morphology ,life cycle, pathogenesis ,Diagnosis, prevention and control • Genital : Trichomonasvaginalis Morphology ,life cycle, pathogenesis ,Diagnosis, prevention and control	1	2
	<b>Protozoa</b> (blood Flagellates)	a1, a2, a3, b1, b2, b3, d2	• Leishmanias (Visceral and cutanouse) Morphology ,life cycle, pathogenesis ,Diagnosis, prevention and control) • Trypanosoma (all types Morphology ,life cycle, pathogenesis ,diagnosis, prevention and control	1	2
	<b>Protozoa</b> (Sporozoa)	a1, a2, a3, b1, b2, b3, d2	• Malaria parasites (Plasmodium falciparum, vivax, ovali , malareae ) Morphology ,life cycle, pathogenesis ,Diagnosis, prevention and control	1	2
4	<b>Helminthes</b>	a1, a2, a3, b1, b2, b3, d2	• Classification of helminthes (common worms (Nematodes), schistosoma, tape worms : Taenia, H. nana (Trematodes ), filariasis. • Morphology ,life cycle, pathogenesis, Diagnosis, prevention and control of helminthes from each class.).	2	4
5	<b>Arthropods</b>	a1, a2, a3, b1, b2, b3, d2	• classification, morphology, life cycle, pathogenicity, prevention and treatment	1	2
<b>Course Review</b>		a1, a2, a3, b1, b2, b3, d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5

Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs
1.	investigation of Enatamopeahistolytica&Enatamopea coli	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
2.	investigation of Giardia	3	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
3.	investigation of Trichomonas	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
4.	investigation of Leishmania	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
5.	investigation of Malaria spp (with preparation of blood smear)	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
6.	investigation of Ascaris&Ancylostoma	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
7.	investigation of Taeniaspp	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
8.	investigation of H. nana	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
9.	investigation of schistosoma	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
10.	investigation of Arthropodes	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.          The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a summary report on one of the studied pathogenic parasite.	c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to make a letter of education to community about infection of one of the studied parasite.	c5, c6, d1, d3, d5	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, , b1, , b2, b3, , , d2
2	Assignments (1 + 2)	4-13, 14	5	5	c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	3	3	a3, b1
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2,a3, , b1, ,b2, b3 , d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, , b1, , b2, b3, , , d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4, d5
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a1, , b1, ,,c1, c2, c3, c4, c6, d5
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, b1, b1, , b3, ,
6	Practical exam (practical)	14	20	20	a1, , b1, ,,c1, c2, c3, c4, c6, d5
Total			40	40 %	

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Kayser, Medical Microbiology & parasitology, 2005 Thieme
<b>2- Essential References.</b>
1. Michael j. Cuomo. Diagnosing medical parasites: a public health officers guide to assisting laboratory and medical officers, USAF 2. Chatterjee. Parastology 3. Parija. Text book of medical parastology W. B. Hugo: pharmaceutical microbiology, 1998, Black well science LTD.
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PATHOPHYSIOLOGY

<b>I. Course Identification and General Information:</b>					
1.	Course Title:	PATHOPHYSIOLOGY			
2.	Course Code & Number:	PHRC 03			
3.	Credit hours:	C.H			TOTAL
		Theoretical			
		L.	Tut.	S.	
		2	-	-	
4.	Study level/ semester at which this course is offered:	<i>( THIRD ) Year –( 1<sup>ST</sup> ) semester</i>			
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General biology</li> <li>Anatomy &amp; histology</li> <li>Physiology I &amp; II</li> <li>Pathology</li> </ul>			
6.	Co –requisite (if any):	Pharmacology II			
7.	Program (s) in which the course is offered:	All BC programs offered by the university			
8.	Language of teaching the course:	ENGLISH			
9.	Location of teaching the course:	IN THE UNIVERSITY			
10	Prepared By:				
11	Date of Approval	<b>10/2014</b>			

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course concerns with the study of etiology, mechanisms , phases and changes in physiological functions, risk factors , investigations and complications of common types of diseases. This course is regarded as a complementary course for the pathology and physiology which have been studied by the students in the previous semesters and also a support for pharmacology and pharmacotherapy courses.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the causes (etiology) of diseases and risk factors that predisposing or exacerbating of common type of diseases.
2.		a2. Determine how of common type of diseases are progressed and their eventual complications.
3.	B1	b1. Differentiate between causes and risk factors of common type of diseases.
4.		b2. Interpret investigational data of common type of diseases.
5.		b3. Relate between investigational data
6.	B2	b4. Predict complications of common type of diseases.
7.	B4	b5. Assess the stage of disease progress.
8.	C4	c1. Search efficiently for information using documented and electronic sources of information.
9.		c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
10.	D1	d1. Share successfully in team-work.
11.	D2	d2. Show respect to life.
12.	D3	d3. Communicate effectively with his/her colleagues.
13.	D5	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam , Attendance

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning	Teaching strategies	Assessment Strategies

Outcomes		
b1, b2	Lecture, feed-back learning	Written exam , Attendance, quizzes
b3	Lecture	Written exam , Attendance
b4	Lecture	Written exam , Attendance, quizzes
b5	Lecture , feed-back learning	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d4	Feed-back learning	Assignments

<b>IV. Course Content:</b>					
<b>Order</b>	<b>Units/ Topics List</b>	<b>CILOs</b>	<b>Sub Topics List</b>	<b>No. of Weeks</b>	<b>contact hours</b>
Etiology, risk factors, progress , stages , clinical features , investigation and complications of the following diseases					
1	<b>Alimentary system diseases/ disorders</b>	a2, a2, b1, b2, b3, b4, b5, d2	vomiting, diarrhoea , Peptic ulcer, , irritable-bowel syndrome, hepatic failure	2	4
2	<b>respiratory system diseases/ disorders</b>	a2, a2, b1, b2, b3, b4, b5, d2	Bronchial asthma , cough	2	4
3	<b>CVS system diseases/ disorders</b>	a2, a2, b1, b2, b3, b4, b5, d2	hypertension , angina, arrhythmia, congestive heart failure.	2	4
<b>MID-TERM EXAM</b>				1	2
4	<b>Renal system diseases/ disorders</b>	a2, a2, b1, b2, b3, b4, b5, d2	renal failure, patients on haemodialysis	2	4
5	<b>Endocrinologic diseases/ disorders</b>	a2, a2, b1, b2, b3, b4, b5, d2	diabetes mellitus, thyroid disorders, infertility	2	4
6	<b>Neurological diseases/ disorders</b>	a2, a2, b1, b2, b3, b4, b5, d2	epilepsy, depression , psychosis	1	2
7	<b>Infective diseases/ disorders</b>	a2, a2, b1, b2, b3, b4, b5, d2	bacteremia , septicemia, AIDS	2	4
<b>Course Review</b>		a2, a2, b1, b2, b3, b4, b5, d2	Review and discussion session of the studied topics.	1	2
<b>FINAL - EXAM</b>				1	2

TOTAL	16	32
Number of Weeks /and Units Per Semester	16 weeks	7 Units

## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Field training**: each 2-3 students are commissioned to do certain assignments in a real field entity such as drug factory, hospitals, pharmacies under supervision of both the field principle and an academic supervisor

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report on investigational lab. Report of one of the studied disease.	c1, c2, d4	4	6
2	<b>Group</b> : each group of students will be assigned to provide a pathophysiologic search-based report on a disease that was not included in the studied topics e.g. <ul style="list-style-type: none"> <li>• Thrombocytosis</li> <li>• Hemorrhage</li> <li>• Parkinsonism</li> <li>• Skin fungal infections</li> <li>• Dingu fever</li> </ul>	c1, c2, d1, d3, d4	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a2, a2, b1, b2, b3, b4, b5, d2
2	Assignments (1 + 2)	4, 14	10	10	c1, c2, d1, d3, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b4, b5, b6, b3, b8, b4
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a2, a2, b1, b2, b3, b4, b5, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a2, a2, b1, b2, b3, b4, b5, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Martin M. Zadnaovich , essentials of pathophysiology for pharmacy, 2003, CRC press.
<b>2- Essential References.</b>
2. Valentina L. Brashers, Clinical Applications of Pathophysiology: Assessment, Diagnostic Reasoning, and Management
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

### IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of PATHOPHYSIOLOGY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
<p>The course concerns with the study of etiology, mechanisms , phases and changes in physiological functions, risk factors , investigations and complications of common types of diseases. This course is regarded as a complementary course for the pathology and physiology which have been studied by the students in the previous semesters and also as a supporting for pharmacology and pharmacotherapy courses.</p>

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
14.	A1	a1. Identify the causes (etiology) of diseases and risk factors that predisposing or exacerbating of common type of diseases.
15.		a2. Determine how of common type of diseases are progressed and their eventual complications.
16.	B1	b1. Differentiate between causes and risk factors of common type of diseases.
17.		b2. Interpret investigational data of common type of diseases.
18.		b3. Relate between investigational data
19.	B2	b4. Predict complications of common type of diseases.
20.	B4	b5 . Assess the stage of disease progress.
21.	C4	c1 .Search efficiently for information using documented and electronic sources of information.
22.	C4	c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
23.	D1	d1. Share successfully in team-work.
24.	D2	d2. Show respect to life.
25.	D3	d3. Communicate effectively with his/her colleagues.
26.	D5	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

2. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies

b1, b2	Lecture, feed-back learning	Written exam , Attendance, quizzes
b3	Lecture	Written exam , Attendance
b4	Lecture	Written exam , Attendance, quizzes
b5	Lecture , feed-back learning	Written exam , Attendance
<b>(C) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d3	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d4	Feed-back learning	Assignments

<b>IV. Course Content:</b>					
<b>Order</b>	<b>Units/ Topics List</b>	<b>CILOs</b>	<b>Sub Topics List</b>	<b>No. of Weeks</b>	<b>contact hours</b>
Etiology, risk factors, progress , stages , clinical features , investigation and complications of the following diseases					
1	<b>Alimentary system diseases/ disorders</b>	a2, a2, b1, b2, b3, b4, b5, d2	vomiting, diarrhoea , Peptic ulcer, , irritable-bowel syndrome, hepatic failure	2	4
2	<b>respiratory system diseases/ disorders</b>	a2, a2, b1, b2, b3, b4, b5, d2	Bronchial asthma , cough	2	4
3	<b>CVS system diseases/ disorders</b>	a2, a2, b1, b2, b3, b4, b5, d2	hypertension , angina, arrhythmia, congestive heart failure.	2	4
<b>MID-TERM EXAM</b>				1	2
4	<b>Renal system diseases/ disorders</b>	a2, a2, b1, b2, b3, b4, b5, d2	renal failure, patients on haemodialysis	2	4
5	<b>Endocrinologic diseases/ disorders</b>	a2, a2, b1, b2, b3, b4, b5, d2	diabetes mellitus, thyroid disorders, infertility	2	4
6	<b>Neurological diseases/ disorders</b>	a2, a2, b1, b2, b3, b4, b5, d2	epilepsy, depression , psychosis	1	2
7	<b>Infective diseases/ disorders</b>	a2, a2, b1, b2, b3, b4, b5, d2	bacteremia , septicemia, AIDS	2	4
<b>Course Review</b>		a2, a2, b1, b2, b3, b4, b5, d2	Review and discussion session of the studied topics.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Field training**: each 2-3 students are commissioned to do certain assignments in a real field entity such as drug factory, hospitals, pharmacies under supervision of both the field principle and an academic supervisor

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report on investigational lab. Report of one of the studied disease.	c1, c2, d4	4	6
2	<b>Group</b> : each group of students will be assigned to provide a pathophysiologic search-based report on a disease that was not included in the studied topics e.g. <ul style="list-style-type: none"> <li>• Thrombocytosis</li> <li>• Hemorrhage</li> <li>• Parkinsonism</li> <li>• Skin fungal infections</li> <li>• Dingu fever</li> </ul>	c1, c2, d1, d3, d4	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a2, a2, b1, b2, b3, b4, b5, d2
2	Assignments (1 + 2)	4, 14	10	10	c1, c2, d1, d3, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b4, b5, b6, b3, b8, b4
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a2, a2, b1, b2, b3, b4, b5, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a2, a2, b1, b2, b3, b4, b5, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Martin M. Zadnaovich , essentials of pathophysiology for pharmacy, 2003, CRC press.

### 2- Essential References.

2. Valentina L. Brashers, Clinical Applications of Pathophysiology: Assessment, Diagnostic Reasoning, and Management

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



### IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PHARMACEUTICAL INSTRUMENTAL ANALYSIS I

<b>I. Course Identification and General Information:</b>					
1.	Course Title:	PHARMACEUTICAL INSTRUMENTAL ANALYSIS I			
2.	Course Code & Number:	PHRM 07			
3.	Credit hours:	C.H			TOTAL
		Theoretical			
		L.	Tut.	S.	
		2	-	-	
			P.	Tr.	
			1	-	3
4.	Study level/ semester at which this course is offered:	( <i>THIRD</i> ) Year – ( <i>1<sup>ST</sup></i> ) semester			
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General chemistry</li> <li>Analytical chemistry</li> </ul>			
6.	Co –requisite (if any):	none			
7.	Program (s) in which the course is offered:	All BC programs offered by the university			
8.	Language of teaching the course:	ENGLISH			
9.	Location of teaching the course:	IN THE UNIVERSITY			
10	Prepared By:				
11	Date of Approval	<b>10/2014</b>			

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of essential principles, instrumentation and pharmaceutical applications of spectrophotometric, spectroscopic and chromatographic techniques.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explicit the physicochemical properties of matters that are used as basis for qualitative and quantitative instrumental analysis.
2.	A3	a2. Discuss the principles, instrumentations and pharmaceutical applications of spectrophotometric, spectroscopic and chromatographic techniques.
3.	A4	a3. Comprehend his/her role as a pharmacist in providing precise and accurate analytical results based on implementing strict standard operative and analytical procedures.
4.	B1	b1. Interpret correctly outcome data of an instrumental analysis.
5.		b2. Solve problems related to the studied instrumental analytical techniques including identification and/or quantitation of test samples.
6.	B2	b3. Classify instrumental analytical techniques based on their principles and applications.
7.		b4. Compare between various types of instrumental analytical techniques.
8.	B4	b5. Assess the accuracy and precision of an instrumental analytical techniques.
9.		b6. Select the appropriate technique to perform an instrumental quantitative/qualitative analysis.
10.	C1	c1. Handle efficiently the tools and chemicals used in pharmaceutical instrumental analysis Lab.
11.		c2. Operate successfully the instruments used in pharmaceutical instrumental analysis Lab.
12.	C2	c3. Perform effectively the experiments and practical tasks including qualitative and quantitative analysis of substances in a given sample using standard procedures.
13.	C3	c4. Take the required safety criteria during performing different types of practical and professional pharmacy works.
14.	C4	c5. Search efficiently for information using documented and electronic sources of information.
15.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.

16.	D1	d1. Share successfully in team-work.
17.	D2	d2. Communicate effectively with his/her colleagues.
18.	D3	d3. Behave in discipline during practicing practical and professional works and assignments.
19.	D4	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

2. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2	Lecture	Written exam , Attendance
a3	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b2	Lecture laboratory practice Feed-back learning	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam) Assignments , quizzes
b3, b4	Lecture	Written exam , Attendance
b5, b6	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment,

		oral/written exam , practical exam)
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Visible and UV Spectrophotometry</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• Electromagnetic radiation, units, electromagnetic</li> <li>• Light spectra</li> <li>• Principle: Absorption and emission of radiation</li> <li>• Lambert's and Beer's Laws</li> <li>• Deviation from Lambert-Beer's law</li> <li>• Instrumentation</li> <li>• Colorometry, Chromophores and Auxochromes shifts,</li> <li>• Applications of Ultraviolet and Visible in quantitative analysis of drugs; data validation : calibration curve linearity, regression equation</li> <li>• Applications of Ultraviolet and Visible in qualitative analysis: Wavelength of maximal absorbance with illustrates examples</li> <li>• Factors Affecting Spectral Response</li> <li>• Data validation: specificity, robustness</li> </ul>	2	4
2	<b>Fluorescence spectrophotometry (Fluorimetry)</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• Principle, emission and Intensity: governing law</li> <li>• Instrumentation</li> <li>• Applications of quantitative analysis of drugs</li> <li>• Data validation: specificity, robustness</li> </ul>	1	2

3	<b>Atomic absorption &amp; Atomic emission spectrophotometry</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	Principles, instrumentations, procedures, applications of these two techniques of spectrophotometry	1	2
4	<b>Infrared spectroscopy</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• Definition and purpose, Instrumentation, Wavenumber and types of vibration of Chemical groups</li> <li>• Fourier transform infrared (FTIR) spectroscopy</li> <li>• Preparation of samples</li> <li>• Control of resolution performance</li> <li>• Verification of the wave-number scale</li> <li>• Near-infrared spectrophotometry Factors Affecting Spectral Response</li> <li>• Identification using reference substances or reference spectra Interpretation of IR spectra with examples</li> </ul>	3	6
<b>mid-term exam</b>				1	2
5	<b>Mass spectroscopy</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• Principle</li> <li>• Instrumentation</li> <li>• Procedures</li> <li>• Interpretation of data with examples</li> </ul>	2	4
6	<b>Nuclear Magnetic Resonance Spectroscopy (NMR)</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• Principle</li> <li>• Types 1H NMR and 13C NMR): comparison</li> <li>• Instrumentation</li> <li>• Procedures</li> <li>• Interpretation of data</li> </ul>	2	4
7	<b>Chromatography Quantitation</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• HPLC and GC</li> </ul> <p><b>Note</b> the principles and instrumentation of chromatographic techniques have been discussed previously in "Phytochemistry courses".</p>	2	4

Course Review	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM			1	2
TOTAL			16	32
Number of Weeks /and Units Per Semester			16 weeks	7 Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs
1.	Uv-visible spectrophometricopertation& calibration	1	2	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
2.	Uv-visible spectrophometric analysis of drugs : metformine tablets	1	2	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
3.	Uv-visible spectrophometric analysis of drugs : chloroquine injection	1	2	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
4.	I.R. spectroscopy simulation and Interpretation of spectrum	2	4	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
5.	Mass spectroscopy simulation and Interpretation of spectrum	2	4	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
6.	HPLC quantitative analysis of drugs : dextromethorphan	1	2	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
7.	HPLC quantitative analysis of drugs : dextromethorphan , metoclopramide	2	4	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
8.	Gas quantitative analysis of drugs	1	2	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit</b>	



		hours	
Number of Weeks		12	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve the problems provided by the teacher at the end of each unit.	b2, c5, c6, d4	4-13	3
2	<b>Group :</b> each group of students will be assigned to provide a video of simulation of one of the analytical technique studied. The students of each group must explain the simulation for other students.	c5, c6, d1, d2, d4	14	2

## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2 , a3, b1, b2, b3b4,b7, b5, b6, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b2, c5, c6, d1, d2, d4
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b1, b2
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2 , a3, b1, b2, b3b4,b7, b5, b6, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, , b1, b2, b1, b2, b5, b6, c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
2	Lab. Attitude	weekly	2.5	2.5	c4, d1, d2, d3
3	Lab. Accomplishments	weekly	5	5	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d4
4	Lab. Reporting	weekly	2.5	2.5	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, b1, b2, b1, b2, b5, b6
6	Practical exam (practical)	14	20	20	a1, a2, , b1, b2, b1, b2, b5, b6, c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. David Harvey, modern analytical chemistry, 2000, McGraw-Hill
2. British pharmacopeia 2013

### 2- Essential References.

1. Hadkar. Instrumental methods in pharmaceutical analysis
2. Purcell. Pharmaceutical analysis

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

### IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of

### Pharmaceutical instrumental analysis I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with the study of essential principles, instrumentation and pharmaceutical applications of spectrophotometric, spectroscopic and chromatographic techniques.

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A2	a1. Explicit the physicochemical properties of matters that are used as basis for qualitative and quantitative instrumental analysis.
2.	A3	a2. Discuss the principles, instrumentations and pharmaceutical applications of spectrophotometric, spectroscopic and chromatographic techniques.
3.	A4	a3. Comprehend his/her role as a pharmacist in providing precise and accurate analytical results based on implementing strict standard operative and analytical procedures.
4.	B1	b1. Interpret correctly outcome data of an instrumental analysis.
5.		b2. Solve problems related to the studied instrumental analytical techniques including identification and/or quantitation of test samples.
6.	B2	b3. Classify instrumental analytical techniques based on their principles and applications.
7.		b4. Compare between various types of instrumental analytical techniques.
8.	B4	b5. Assess the accuracy and precision of an instrumental analytical techniques.
9.		b6. Select the appropriate technique to perform an instrumental quantitative/qualitative analysis.
10.	C1	c1. Handle efficiently the tools and chemicals used in pharmaceutical instrumental analysis Lab.
11.		c2. Operate successfully the instruments used in pharmaceutical instrumental analysis Lab.
12.	C2	c3. Perform effectively the experiments and practical tasks including qualitative and quantitative analysis of substances in a given sample using standard procedures.
13.	C3	c4. Take the required safety criteria during performing different types of practical and professional pharmacy works.
14.	C4	c5. Search efficiently for information using documented and electronic sources of information.
15.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.

16.	D1	d1. Share successfully in team-work.
17.	D2	d2. Communicate effectively with his/her colleagues.
18.	D3	d3. Behave in discipline during practicing practical and professional works and assignments.
19.	D4	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

2. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2	Lecture	Written exam , Attendance
a3	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b2	Lecture laboratory practice Feed-back learning	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam) Assignments , quizzes
b3, b4	Lecture	Written exam , Attendance
b5, b6	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment,

		oral/written exam , practical exam)
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments



## V. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Visible and UV Spectrophotometry</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• Electromagnetic radiation, units, electromagnetic</li> <li>• Light spectra</li> <li>• Principle: Absorption and emission of radiation</li> <li>• Lambert's and Beer's Laws</li> <li>• Deviation from Lambert-Beer's law</li> <li>• Instrumentation</li> <li>• Colorometry, Chromophores and Auxochromes shifts,</li> <li>• Applications of Ultraviolet and Visible in quantitative analysis of drugs; data validation : calibration curve linearity, regression equation</li> <li>• Applications of Ultraviolet and Visible in qualitative analysis: Wavelength of maximal absorbance with illustrates examples</li> <li>• Factors Affecting Spectral Response</li> <li>• Data validation: specificity, robustness</li> </ul>	2	4
2	<b>Fluorescence spectrophotometry (Fluorimetry)</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• Principle, emission and Intensity: governing law</li> <li>• Instrumentation</li> <li>• Applications of quantitative analysis of drugs</li> <li>• Data validation: specificity, robustness</li> </ul>	1	2

3	<b>Atomic absorption &amp; Atomic emission spectrophotometry</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	Principles, instrumentations, procedures, applications of these two techniques of spectrophotometry	1	2
4	<b>Infrared spectroscopy</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• Definition and purpose, Instrumentation, Wavenumber and types of vibration of Chemical groups</li> <li>• Fourier transform infrared (FTIR) spectroscopy</li> <li>• Preparation of samples</li> <li>• Control of resolution performance</li> <li>• Verification of the wave-number scale</li> <li>• Near-infrared spectrophotometry Factors Affecting Spectral Response</li> <li>• Identification using reference substances or reference spectra Interpretation of IR spectra with examples</li> </ul>	3	6
<b>mid-term exam</b>				1	2
5	<b>Mass spectroscopy</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• Principle</li> <li>• Instrumentation</li> <li>• Procedures</li> <li>• Interpretation of data with examples</li> </ul>	2	4
6	<b>Nuclear Magnetic Resonance Spectroscopy (NMR)</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• Principle</li> <li>• Types 1H NMR and 13C NMR): comparison</li> <li>• Instrumentation</li> <li>• Procedures</li> <li>• Interpretation of data</li> </ul>	2	4
7	<b>Chromatography Quantitation</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• HPLC and GC</li> </ul> <p><b>Note</b> the principles and instrumentation of chromatographic techniques have been discussed previously in "Phytochemistry courses".</p>	2	4

<b>Course Review</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>			1	2
<b>TOTAL</b>			16	32
<b>Number of Weeks /and Units Per Semester</b>			16 weeks	7 Units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Intended Learning Outcomes CILOs</b>
1.	Uv-visible spectrophometric pertation & calibration	1	2	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
2.	Uv-visible spectrophometric analysis of drugs : metformine tablets	1	2	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
3.	Uv-visible spectrophometric analysis of drugs : chloroquine injection	1	2	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
4.	I.R. spectroscopy simulation and Interpretation of spectrum	2	4	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
5.	Mass spectroscopy simulation and Interpretation of spectrum	2	4	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
6.	HPLC quantitative analysis of drugs : dextromethorphan	1	2	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
7.	HPLC quantitative analysis of drugs : dextromethorphan , metoclopramide	2	4	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
8.	Gas quantitative analysis of drugs	1	2	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.          The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to solve the problems provided by the teacher at the end of each unit.	b2, c5, c6, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to provide a video of simulation of one of the analytical technique studied. The students of each group must explain the simulation for other students.	c5, c6, d1, d2, d4	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2 , a3, b1, b2, b3b4,b7, b5, b6, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b2, c5, c6, d1, d2, d4
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b1, b2
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a1, a2 , a3, b1, b2, b3b4,b7, b5, b6, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, , b1, b2, b1, b2, b5, b6, c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
2	Lab. Attitude	weekly	2.5	2.5	c4, d1, d2, d3
3	Lab. Accomplishments	weekly	5	5	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d4
4	Lab. Reporting	weekly	2.5	2.5	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, b1, b2, b1, b2, b5, b6
6	Practical exam (practical)	14	20	20	a1, a2, , b1, b2, b1, b2, b5, b6, c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
Total			40	40 %	

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. David Harvey, modern analytical chemistry, 2000, McGraw-Hill 2. British pharmacopeia 2013
<b>2- Essential References.</b>
1. Hadkar. Instrumental methods in pharmaceutical analysis 2. Purcell. Pharmaceutical analysis
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

Medical sciences college  
 Department: Pharmacy  
 Title of the Program: PHARMACY BACHELOR

## Course Specification

### PHARMACEUTICS II

I. Course Identification and General Information:						
1.	Course Title:	PHARMACEUTICS II				
2.	Course Code &Number:	PHRT 06				
3.	Credit hours:	C.H			TOTAL	
		Theoretical		P.		Tr.
		L.	Tut.			
		2	-	-		1
4.	Study level/ semester at which this course is offered:	( <i>THIRD</i> ) Year – ( <i>1<sup>ST</sup></i> ) semester				
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>• Introduction to pharmacy profession</li> <li>• Physical pharmacy</li> <li>• Pharmaceutical calculation skills</li> <li>• Pharmaceutics I</li> </ul>				
6.	Co –requisite (if any):	None				
7.	Program (s) in which the course is offered:	All BC programs offered by the university				
8.	Language of teaching the course:	ENGLISH				
9.	Location of teaching the course:	IN THE UNIVERSITY				
10.	Prepared By:					
11.	Date of Approval	<b>10/2014</b>				

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of pharmaceutical aerosols, semisolid and suppositories. The course also deals with powders and granules as an introduction to tablets and capsules solid dosage forms.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explicit the general properties, advantages and disadvantages of pharmaceutical aerosols, semisolid , suppositories, powders and granules.
2.	A1	a2. Discuss the principles, pharmacopeial requirements, methods of preparation, of various types pharmaceutical aerosols, semisolid , suppositories, powders and granules.
3.		a3. Explicit the types and roles of excipients included in different types of pharmaceutical aerosols, semisolid , suppositories, powders and granules.
4.	A2	a4. Comprehend his/her role as pharmacist in formulation of pharmaceutical dosage forms.
5.	B1	b1. Calculate the amount of ingredient required to prepare an enlarged or reduced amount of a pharmaceutical formula.
6.	B2	b2 .Categorizepharmaceuticalaerosols, semisolid , suppositories, powders and granules.
7.		b3. Compare between various types ofpharmaceuticalaerosols, semisolid , suppositories, powders and granules.
8.		b4. Relate the selection of excipients and the method of preparation of pharmaceutical aerosols, semisolid , suppositories, powders and granules to formulation, compatibility and stability factors.
9.	B3	b5. Formulate the active ingredient and excipients into an appropriate pharmaceutical aerosols, semisolid , suppositories, powders and granules.
10.	B4	b6 . Assess the quality of the prepared pharmaceutical semisolid , suppositories, powders and granules.
11.	C1	c1.Handle efficiently the tools and chemicals used in pharmaceutics Lab.
12.		c2. Operate successfully the instruments used in pharmaceutics Lab.
13.	C2	c3. Prepare successfully pharmaceutical liquid dosage forms using standard procedures.
14.	C3	c4 .Take the required safety criteria during preparation pharmaceutical dosage forms in pharmaceutics Lab.
15.	C4	c5 .Search efficiently for information using documented and electronic sources of information.

16.		c6. Present and report his/her work correctly using appropriate writing rules and technologies media.
17.	D1	d1. Share successfully in team-work.
18.	D3	d2. Communicate effectively with his/her colleagues.
19.	D4	d3. Comply to pharmacy laws and ethics and behave in discipline during practical works.
20.	D5	d4. Demonstrate time management and self-learning skills during performing assignments and practical works.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2, a3	Lecture	Written exam , Attendance
a4	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b2, b3, b4	Lecture	Written exam , Attendance, quizzes
b5	Lecture	Written exam , Attendance
b6	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab.

		attendance, accomplishment, attitude, practical exam)
c5	Feed-back learning, Group-project	Assignments
c6	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam), Assignments

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3	laboratory practice, Feed-back learning, group project	Practical assessment (Lab. attendance, attitude, practical exam), Assignments
d4	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) , Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Pharmaceutical aerosols</b>	a1, a2, a3, b2, b3, b4, b5	Definition , advantages, disadvantages, types of aerosols, anatomical features of the bronchi, Pressurized packages (Type of propellants , Containers , Formulation aspects, Air-blast nebulizers), methods of preparation (pressurized filling, cold filling), quality control evaluation	2	4
2	<b>Pharmaceutical semisolid dosage forms</b>	a1, a2, a3, b2, b3, b4, b5	<ul style="list-style-type: none"> <li>• <b>introduction:</b> definitions , advantages, disadvantages, types, anatomical features and targets of the skin,</li> <li>• <b>ointments</b> (definitions, advantages, advantages, disadvantages, classification based on type of ointment base, formulation considerations, method of preparation)</li> <li>• <b>Pastes:</b> (definitions, advantages, advantages, disadvantages, classification based on type of ointment base,</li> <li>• <b>Creams</b> (definitions, advantages, advantages, disadvantages,</li> <li>• classification, formulation considerations, method of preparation</li> <li>• <b>Gels</b> (definitions, advantages, classification, formulation , considerations, method of preparation</li> </ul>	4	8
<b>Mid-semester exam</b>				1	2
3	<b>Suppositories</b>	a1, a2, a3, b2, b3, b4, b5	definitions, advantages, advantages, disadvantages, classification (rectal, vaginal) formulation, types of suppository bases, method of preparation	2	4
4	<b>Pharmaceutical solid dosage forms (Powders)</b>	a1, a2, a3, b2, b3, b4, b5	<ul style="list-style-type: none"> <li>○ Definitions, advantages, disadvantages</li> <li>○ classification (coarse, fine, microfine, etc; divided, bulk; compounded; medicated,</li> </ul>	3	6

			cosmetic) o Formulation considerations (characters of ingredients morphology, flowability, stability, particle size, compatibility) o Comminuting and Blending of powders Bulk and divided powders: formulation, examples o Dusting powder: formulation, examples o Powders packaging: folding in papers o Quality control evaluation : evaluation of mixing, flowability, water content, assay, stability, etc.		
5	<b>Pharmaceutical solid dosage forms (Granules)</b>	a1, a2, a3, b2, b3, b4, b5	o Definition, advantages, disadvantages o Method of preparation o Formulation considerations (characters of ingredients morphology, flowability, stability, particle size, compatibility) <b>Effervescent granules</b> o Definition, composition o Method of preparation: dry (fusion) method, wet method o o Determination of the required quantity of sodium bicarbonate, tartaric acid and citric acid in the formulation	2	4
<b>Course Review</b>		a1, a2, a3, b2, b3, b4, b5	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Intended Learning Outcomes CIOs</b>
1.	Pharmaceutical aerosols: construction and use	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2.	Preparation of salicylic acid 2 % ointment in simple ointment base	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
3.	Preparation of hydrophilic ointment USP	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4.	Preparation of Polyethylene glycol ointment base.	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
5.	Preparation of o/ w creams: vanishing cream base	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
6.	Preparation of w/o creams: cold cream base	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
7.	Preparation of hydrophilic gel base : Carbomer or Carboxymethyl cellulose gel	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
8.	Preparation of Aspirin in cocoa butter base suppositories.	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
9.	Preparation of Glycerin suppositories.	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
10.	Preparation of Dusting powders	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
11.	Preparation of Effervescent base granules	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
PRACTICAL EXAM		1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to present a search report supported with images on 5 trade names (commercial preparations) of the studied dosage forms	c5, c6, d4	4-13	3
2	<b>Group</b> :every group is assigned to present an illustrating videos on lab. And industrial preparation of 3 types of studies dosage forms.	c5, c6, d1, d4	14	2

## VII. Schedule of Assessment Tasks for Students During the Semester

Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b2, b3, b4, b5
2	Assignments (1 + 2)	4, 14	5	5	c5, c6, d1, d4
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b3
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a3, b2, b3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b2, b3, b4, b5
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2	Lab. Attitude	weekly	2.5	2.5	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4	Lab. Reporting	weekly	2.5	2.5	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b6
6	Practical exam (practical)	14	20	20	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
Total			40	40 %	



## VIII. Learning Resources

### 1- Required Textbook(s) ( maximum two ).

1. Aulton M.E., *Pharmaceutics: the science of dosage form design*, 2002, Churchill Livingstone, UK
2. Ansel's *Pharmaceutical dosage forms and drug delivery system*, 2011, Lippincott Williams and Wilkins, USA

### 2- Essential References.

1. Rawlins. Bentley s of text book of pharmaceutics
2. Kasture pharmaceutics
3. Raje. pharmaceutics
4. Raph. practical pharmaceutics

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of PHARMACEUTICS II

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
<p>The course deals with the study of pharmaceutical aerosols, semisolid and suppositories. The course also deals with powders and granules as an introduction to tablets and capsules solid dosage forms.</p>

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A2	a1. Explicit the general properties, advantages and disadvantages of pharmaceutical aerosols, semisolid , suppositories, powders and granules.
2.	A1	a2. Discuss the principles, pharmacopeial requirements, methods of preparation, of various types pharmaceutical aerosols, semisolid ,

		suppositories, powders and granules.
3.		<b>a3.</b> Explicit the types and roles of excipients included in different types of pharmaceutical aerosols, semisolid , suppositories, powders and granules.
4.	A2	<b>a4.</b> Comprehend his/her role as pharmacist in formulation of pharmaceutical dosage forms.
5.	B1	<b>b1.</b> Calculate the amount of ingredient required to prepare an enlarged or reduced amount of a pharmaceutical formula.
6.	B2	<b>b2</b> .Categorizepharmaceutical aerosols, semisolid , suppositories, powders and granules.
7.		<b>b3.</b> Compare between various types ofpharmaceutical aerosols, semisolid , suppositories, powders and granules.
8.		<b>b4.</b> Relate the selection of excipients and the method of preparation of pharmaceutical aerosols, semisolid , suppositories, powders and granules to formulation, compatibility and stability factors.
9.	B3	<b>b5.</b> Formulate the active ingredient and excipients into an appropriate pharmaceutical aerosols, semisolid , suppositories, powders and granules.
10.	B4	<b>b6</b> . Assess the quality of the prepared pharmaceutical semisolid , suppositories, powders and granules.
11.	C1	<b>c1.</b> Handle efficiently the tools and chemicals used in pharmaceutics Lab.
12.		<b>c2.</b> Operate successfully the instruments used in pharmaceutics Lab.
13.	C2	<b>c3.</b> Prepare successfully pharmaceutical liquid dosage forms using standard procedures.
14.	C3	<b>c4</b> .Take the required safety criteria during preparation pharmaceutical dosage forms in pharmaceutics Lab.
15.	C4	<b>c5</b> .Search efficiently for information using documented and electronic sources of information.
16.		<b>c6.</b> Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	<b>d1.</b> Share successfully in team-work.
18.	D3	<b>d2.</b> Communicate effectively with his/her colleagues.
19.	D4	<b>d3.</b> Comply to pharmacy laws and ethics and behave in discipline during practical works.
20.	D5	<b>d4.</b> Demonstrate time management and self-learning skills during performing assignments and practical works.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
a1	Lecture	Written exam , Attendance
a2, a3	Lecture	Written exam , Attendance
a4	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
b1	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b2, b3, b4	Lecture	Written exam , Attendance, quizzes
b5	Lecture	Written exam , Attendance
b6	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	Feed-back learning, Group-project	Assignments
c6	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam), Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching</b>		

<b>Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d2, d3	laboratory practice, Feed-back learning, group project	Practical assessment (Lab. attendance, attitude, practical exam), Assignments
d4	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) , Assignments

<b>IV. Course Content:</b>					
<b>A – Theoretical Aspect:</b>					
<b>Order</b>	<b>Units/ Topics List</b>	<b>CILOs</b>	<b>Sub Topics List</b>	<b>No. of Weeks</b>	<b>contact hours</b>
1	<b>Pharmaceutical aerosols</b>	a1, a2, a3, b2, b3, b4, b5	Definition , advantages, disadvantages, types of aerosols, anatomical features of the bronchi, Pressurized packages (Type of propellants , Containers , Formulation aspects, Air-blast nebulizers), methods of preparation (pressurized filling, cold filling), quality control evaluation	2	4

2	<b>Pharmaceutical semisolid dosage forms</b>	a1, a2, a3, b2, b3, b4, b5	<ul style="list-style-type: none"> <li>• <b>introduction:</b> definitions , advantages, disadvantages, types, anatomical features and targets of the skin,</li> <li>• <b>ointments</b> (definitions, advantages, advantages, disadvantages, classification based on type of ointment base, formulation considerations, method of preparation)</li> <li>• <b>Pastes:</b> (definitions, advantages, advantages, disadvantages, classification based on type of ointment base,</li> <li>• <b>Creams</b> (definitions, advantages, advantages, disadvantages,</li> <li>• classification, formulation considerations, method of preparation</li> <li>• <b>Gels</b> (definitions, advantages, classification, formulation , considerations, method of preparation</li> </ul>	4	8
<b>Mid-semester exam</b>				1	2
3	<b>Suppositories</b>	a1, a2, a3, b2, b3, b4, b5	definitions, advantages, advantages, disadvantages, classification (rectal, vaginal) formulation, types of suppository bases, method of preparation	2	4
4	<b>Pharmaceutical solid dosage forms (Powders)</b>	a1, a2, a3, b2, b3, b4, b5	<ul style="list-style-type: none"> <li>○ Definitions, advantages, disadvantages</li> <li>○ classification (coarse, fine, microfine, etc; divided, bulk; compounded; medicated, cosmetic)</li> <li>○ Formulation considerations (characters of ingredients morphology, flowability, stability, particle size, compatibility)</li> <li>○ Comminuting and Blending of powders.</li> <li>○ Bulk and divided powders: formulation, examples</li> <li>○ Dusting powder: formulation, examples</li> <li>○ Powders packaging: folding in papers</li> <li>○ Quality control evaluation : evaluation of mixing, flowability, water content, assay, stability, etc.</li> </ul>	3	6

5	<b>Pharmaceutical solid dosage forms (Granules)</b>	a1, a2, a3, b2, b3, b4, b5	<ul style="list-style-type: none"> <li>○ Definition, advantages, disadvantages</li> <li>○ Method of preparation</li> <li>○ Formulation considerations (characters of ingredients morphology, flowability, stability, particle size, compatibility)</li> </ul> <b>Effervescent granules</b> <ul style="list-style-type: none"> <li>○ Definition, composition</li> <li>○ Method of preparation: dry (fusion) method, wet method</li> <li>○ Determination of the required quantity of sodium bicarbonate, tartaric acid and citric acid in the formulation</li> </ul>	2	4
<b>Course Review</b>		a1, a2, a3, b2, b3, b4, b5	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs
12.	Pharmaceutical aerosols: construction and use	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
13.	Preparation of salicylic acid 2 % ointment in simple ointment base	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
14.	Preparation of hydrophilic ointment USP	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
15.	Preparation of Polyethylene glycol ointment base.	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
16.	Preparation of o/ w creams:	1	2	b1, b6, c1, c2, c3, c4, c6,

	vanishing cream base			d1, d2, d3
17.	Preparation of w/o creams: cold cream base	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
18.	Preparation of hydrophilic gel base : Carbomer or Carboxymethyl cellulose gel	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
19.	Preparation of Aspirin in cocoa butter base suppositories.	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
20.	Preparation of Glycerin suppositories.	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
21.	Preparation of Dusting powders	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
22.	Preparation of Effervescent base granules	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
PRACTICAL EXAM		1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## VI. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.

The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills



VI. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to present a search report supported with images on 5 trade names (commercial preparations) of the studied dosage forms	c5, c6, d4	4-13	3
2	<b>Group :</b> every group is assigned to present an illustrating videos on lab. And industrial preparation of 3 types of studies dosage forms.	c5, c6, d1, d4	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b2, b3, b4, b5
2	Assignments (1 + 2)	4-13 , 14	5	5	c5, c6, d1, d4
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b3
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a3, b2, b3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b2, b3, b4, b5
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2	Lab. Attitude	weekly	2.5	2.5	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4	Lab. Reporting	weekly	2.5	2.5	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b6
6	Practical exam (practical)	14	20	20	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
Total			40	40 %	

## VIII. Learning Resources

### 1- Required Textbook(s) ( maximum two ).

1. Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone, UK
2. Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA

### 2- Essential References.

1. Rawlins. Bentley s of text book of pharmaceutics
2. Kasture pharmaceutics
3. Raje. pharmaceutics
4. Raph. practical pharmaceutics

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1. **Class Attendance:** At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam

2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PHARMACOGNOSY II

<b>I. Course Identification and General Information:</b>						
1.	Course Title:	PHARMACOGNOSY II				
2.	Course Code & Number:	PHRG 03				
3.	Credit hours:	C.H			TOTAL	
		Theoretical		P.		Tr.
		L.	Tut.			
		2	-	-		1
4.	Study level/ semester at which this course is offered:	( <i>THIRD</i> ) Year – ( <i>1<sup>ST</sup></i> ) semester				
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General biology</li> <li>Botany</li> <li>Pharmacognosy I</li> </ul>				
6.	Co –requisite (if any):	none				
7.	Program (s) in which the course is offered:	All BC programs offered by the university				
8.	Language of teaching the course:	ENGLISH				
9.	Location of teaching the course:	IN THE UNIVERSITY				
10	Prepared By:					
11	Date of Approval	<b>10/2014</b>				

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course deals with study of common medicinal flowers, seeds, fruits, herbs and unrecognized plant drugs.

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A1	a1. Identify the botanical origin, morphological and microscopical characteristics of common medicinal flowers, seeds, fruits, herbs and unrecognized plant drugs.
2.	A2	a2. Determine the active constituents and therapeutic use of common medicinal flowers, seeds, fruits, herbs and unrecognized plant drugs.
3.	A3	a3. Discuss the principles and procedures applied for obtaining appropriate crude drugs from plants.
4.		a4. Explicit the methods used for detection of active constituents and discovering adulteration of medicinal plants.
5.	A4	a5. Comprehend his/her role as pharmacist in collection, detection, and rationaltherapeutic use of medicinal plants.
6.	B1	b1. Express with drawings the morphology and key microscopical features of medicinal plants
7.		b2. Differentiate between common medicinal flowers, seeds, fruits, herbs and unrecognized plant drugs based on morphological and microscopical features.
8.	B2	b3. Classify active constituents in medicinal plants.
9.		b4. Compare between common medicinal flowers, seeds, fruits, herbs and unrecognized plant drugs according to their botanical origin, plant parts, chemical structures and therapeutic use.
10.	B3	b5. Design a plan to obtain medicinal plants and crude drugs of high quality.
11.	B4	b6. Assess the quality of medicinal plants and crude drugs.
12.		b7. Select the appropriate day time/season for cultivation of medicinal plants.
13.	C1	c1. Handle efficiently the tools and chemicals used in pharmacognosy and phytochemistry Lab.
14.		c2. Operate successfully the instruments used in pharmacognosy and phytochemistry Lab.
15.	C2	c3. Perform effectively using standard procedures the practical works in pharmacognosy and phytochemistry Lab. including preparation of medicinal crude drug samples for microscopical investigation and detection the active constituents and key-microscopical elements.

16.	C3	c4 .Take the required safety criteria during performing different types of pharmacy works
17.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
18.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1. Share successfully in team-work.
20.	D2	d2. Show respect to life.
21.	D3	d3. Communicate effectively with his/her colleagues.
22.	D4	d4.Behave in discipline during practicing practical and professional works and assignments.
23.	D5	d5. Demonstrate time management and self-learning during performing practical works and assignments.

2. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	laboratory practice, lab. practice	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam)
a2	Lecture	Written exam , Attendance
a3, a4	Lecture	Written exam , Attendance
a5	lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies

b1, b2	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3, b4	Lecture	Written exam , Attendance
b5	Lecture	Written exam , Attendance
b7	Lecture	Written exam , Attendance
b6	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)

**(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	Feed-back learning , Group-project	Assignments
c6	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam) , Assignments

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Medicinal flowers</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, cultivation, adulteration detection, active constituents and medical uses of the following medicinal flowers : Clove, Chammoile, Pyrethrum, Tilia, Santonica, Lavender and Saffron..	3	6
2	<b>Medicinal seeds</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, active constituents and medical uses of the following medicinal bark seeds:Cardamom, Colchicine , nux vomica, Linseed, Nutmeg, Black and White Mustard, Fenugreek, Clabar and Nigella.	3	6
Mid-term exam				1	2
3	<b>Medicinal fruits</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, active constituents and medical uses of the following medicinal fruits Ammi vinaga, Anise, Fennel, Caraway, Capsicum, star Anise, Coriander, Vanilla and Senna	3	6
4	<b>Medicinal herbs</b>		Study of botanical origin, microscopical features, active constituents and medical uses of the following medicinal herbs : Ergot, Indian hemp, Chatharanthus, Lobelia, Peppermint, Thyme,Passiflora and Ephedra	2	4
5	<b>Unrecognized plant drugs</b>		<ul style="list-style-type: none"> <li>• Definition , classification, chemical and physical properties</li> <li>• Study of medicinal resin and resin combinations: Colophony, Myrrh, Tolu peru, Tolu Balsam, Oliabanum and Benzoin</li> <li>• Medicinal gums , juices and extracts</li> </ul>	2	4



<b>Course Review</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Review of the course topics by discussion session.	1	2
FINAL - EXAM			1	2
<b>TOTAL</b>			16	32
<b>Number of Weeks /and Units Per Semester</b>			16 weeks	5 Units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>AlignedCourse Intended Learning Outcomes CLOs</b>
1.	morphology and microscopical investigation of medicinal flowers : clove	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
2.	morphology and microscopical investigation of medicinal flowers : Saffron	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
3.	morphology and microscopical investigation of medicinal seeds cardamom	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
4.	morphology and microscopical investigation of medicinal seeds Black & white mustard	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
5.	morphology and microscopical investigation of medicinal fruits Anise	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
6.	morphology and microscopical investigation of medicinal fruits Fennel	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
7.	morphology and microscopical investigation of medicinal fruits Capsicum	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
8.	morphology and microscopical determination of medicinal herbs : Peppermint	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
9.	morphology and microscopical investigation of medicinal herbs : Thyme	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
10.	investigation of medicinal resin : Myrrh	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
11.	investigation of medicinal gum	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.

The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search on the pharmaceutical products available in the drug market of one plant drug studied in the course.	a2, c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to do search report for adulteration of one crude drug studied in the course.	b6, c5, c6, d1, d3, d5	14	2

## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, a5 b1, b2, b4, b5, b6, b7, d2
2	Assignments (1 + 2)	4-13 , 14	5	5	a2, b6, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	3	3	b3, b4
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a2, a4, a5 , b5,b6, b7, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, a5 b1, b2, b4, b5,b6, b7, d2
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6
6	Practical exam (practical)	14	20	20	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6
Total			40	40 %	

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. W.C. Evans, Trease and Evans pharmacognosy, 2009, W.B.Saunders
<b>2- Essential References.</b>
1. Jarald. Colour atlas of medicinal plants 2. Bhandari. Textbook of pharmacognosy. 3. Gokhale. Practical pharmacognosy
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of PHARMACOGNOSY II

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with study of common medicinal flowers, seeds, fruits, herbs and unrecognized plant drugs.

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A1	a1. Identify the botanical origin, morphological and microscopical characteristics of common medicinal flowers, seeds, fruits, herbs and unrecognized plant drugs.
2.	A2	a2. Determine the active constituents and therapeutic use of common medicinal flowers, seeds, fruits, herbs and unrecognized plant drugs.
3.	A3	a3. Discuss the principles and procedures applied for obtaining appropriate crude drugs from plants.
4.		a4. Explicit the methods used for detection of active constituents and discovering adulteration of medicinal plants.
5.	A4	a5. Comprehend his/her role as pharmacist in collection, detection, and rational therapeutic use of medicinal plants.
6.	B1	b1. Express with drawings the morphology and key microscopical features of medicinal plants
7.		b2. Differentiate between common medicinal flowers, seeds, fruits, herbs and unrecognized plant drugs based on morphological and microscopical features.
8.	B2	b3. Classify active constituents in medicinal plants.
9.		b4. Compare between common medicinal flowers, seeds, fruits, herbs and unrecognized plant drugs according to their botanical origin, plant parts, chemical structures and therapeutic use.
10.	B3	b5. Design a plan to obtain medicinal plants and crude drugs of high quality.
11.	B4	b6. Assess the quality of medicinal plants and crude drugs.
12.		b7. Select the appropriate day time/season for cultivation of medicinal plants.
13.	C1	c1. Handle efficiently the tools and chemicals used in pharmacognosy and phytochemistry Lab.
14.		c2. Operate successfully the instruments used in pharmacognosy and phytochemistry Lab.
15.	C2	c3. Perform effectively using standard procedures the practical works in pharmacognosy and phytochemistry Lab. including preparation of medicinal crude drug samples for microscopical investigation and detection the active constituents and key-microscopical elements.

16.	C3	c4 .Take the required safety criteria during performing different types of pharmacy works
17.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
18.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1. Share successfully in team-work.
20.	D2	d2. Show respect to life.
21.	D3	d3. Communicate effectively with his/her colleagues.
22.	D4	d4.Behave in discipline during practicing practical and professional works and assignments.
23.	D5	d5. Demonstrate time management and self-learning during performing practical works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	laboratory practice, lab. practice	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam)
a2	Lecture	Written exam , Attendance
a3, a4	Lecture	Written exam , Attendance
a5	lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
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b1, b2	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3, b4	Lecture	Written exam , Attendance
b5	Lecture	Written exam , Attendance
b7	Lecture	Written exam , Attendance
b6	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)

**(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	Feed-back learning , Group-project	Assignments
c6	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam) , Assignments

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Medicinal flowers</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, cultivation, adulteration detection, active constituents and medical uses of the following medicinal flowers : Clove, Chammoile, Pyrethrum, Tilia, Santonica, Lavender and Saffron..	3	6
2	<b>Medicinal seeds</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, active constituents and medical uses of the following medicinal bark seeds: Cardamom, Colchicine , nux vomica, Linseed, Nutmeg, Black and White Mustard, Fenugreek, Clabar and Nigella.	3	6
Mid-term exam				1	2
3	<b>Medicinal fruits</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, active constituents and medical uses of the following medicinal fruits Ammi vinaga, Anise, Fennel, Caraway, Capsicum, star Anise, Coriander, Vanilla and Senna	3	6
4	<b>Medicinal herbs</b>		Study of botanical origin, microscopical features, active constituents and medical uses of the following medicinal herbs : Ergot, Indian hemp, Chatharanthus, Lobelia, Peppermint, Thyme, Passiflora and Ephedra	2	4
5	<b>Unrecognized plant drugs</b>		<ul style="list-style-type: none"> <li>• Definition , classification, chemical and physical properties</li> <li>• Study of medicinal resin and resin combinations: Colophony, Myrrh, Tolu peru, Tolu Balsam, Oliabanum and Benzoin</li> <li>• Medicinal gums , juices and extracts</li> </ul>	2	4

<b>Course Review</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Review of the course topics by discussion session.	1	2
FINAL - EXAM			1	2
<b>TOTAL</b>			16	32
<b>Number of Weeks /and Units Per Semester</b>			16 weeks	5 Units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>AlignedCourse Intended Learning Outcomes CILOs</b>
12.	morphology and microscopical investigation of medicinal flowers : clove	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
13.	morphology and microscopical investigation of medicinal flowers : Saffron	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
14.	morphology and microscopical investigation of medicinal seeds cardamom	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
15.	morphology and microscopical investigation of medicinal seeds Black & white mustard	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
16.	morphology and microscopical investigation of medicinal fruits Anise	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
17.	morphology and microscopical investigation of medicinal fruits Fennel	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
18.	morphology and microscopical investigation of medicinal fruits Capsicum	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
19.	morphology and microscopical determination of medicinal herbs : Peppermint	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
20.	morphology and microscopical investigation of medicinal herbs : Thyme	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
21.	investigation of medicinal resin : Myrrh	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
22.	investigation of medicinal gum	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.          The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search on the pharmaceutical products available in the drug market of one plant drug studied in the course.	a2, c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to do search report for adulteration of one crude drug studied in the course.	b6, c5, c6, d1, d3, d5	14	2

## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, a5 b1, b2, b4, b5, b6, b7, d2
2	Assignments (1 + 2)	4-13, 14	5	5	a2, b6, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	3	3	b3, b4
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a2, a4, a5 , b5,b6, b7, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, a5 b1, b2, b4, b5,b6, b7, d2
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4, d5
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6
6	Practical exam (practical)	14	20	20	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. W.C. Evans, Trease and Evans pharmacognosy, 2009, W.B.Saunders

### 2- Essential References.

1. Jarald. Colour atlas of medicinal plants
2. Bhandari. Textbook of pharmacognosy.
3. Gokhale. Practical pharmacognosy

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification **PHARMACOTHERAPY I**

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	PHARMACOTHERAPY I					
2.	Course Code & Number:	PHRC 06					
3.	Credit hours:	C.H				TOT AL	
		Theoretical			P		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( <i>THIRD</i> ) Year – ( <i>2<sup>ND</sup></i> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>• General biology</li> <li>• Anatomy and histology</li> <li>• Physiology I &amp; II</li> <li>• Pathology</li> <li>• Pathophysiology</li> <li>• Pharmacology I &amp; II</li> </ul>					
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>• Clinical pharmacy I</li> <li>• Integrated- case based learning I</li> </ul>					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10.	Prepared By:						
11.	Date of Approval	10/2014					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course deals with the study of the therapeutic goals, selection of drugs (first choices , alternatives, supportive) and the standard therapeutic protocols (plans) for treatment of common diseases . This course is complementary to pathophysiology and pharmacology I & II courses and is supportive for clinical pharmacy , pharmacy practice skills, and integrated-case based learning" courses. The course concerns with drug therapy of disorders/diseases of alimentary, cardiovascular , renal systems, Endocrinologic disorders and infections.



<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A1	a1. Determine therapeutic goals treating of diseases.
2.	A2	a2. Determinethe appropriate drugs (first choices , alternatives and supportive) for treatment of diseases.
3.	A3	a3. Discuss the international (WHO, FDA or NHS or others) and the local (if any) therapeutic protocol for treatment of common diseases.
4.	A4	a4. Comprehend his/her role as a pharmacist in defining therapeutic goals, selection of appropriate drugs and implementing therapeutic protocols for the favor of optimal treating of diseases.
5.	B2	b1. Differentiate between essential and supportive drugs for management of diseases.
6.		b2 .Classify drugs to be used for management of common diseases into essential, prophylactic and supportive drugs.
7.		b3. Compare between drugs based on benefit/ risk ratio.
8.		b4. Relate the drug selection to case (patient), appropriateness, availability and other factors.
9.	B3	b5.Design a therapeutic protocol for treating common diseases.
10.		b6. Predict the expected risks of using a drugin treatment of common diseases.
11.	B4	b7 . Assess the appropriateness of drugs prescribed/recommended for management of diseases.
12.		b8. Select the drug of choice and other complementary drugs appropriately for management of common diseases.
13.	C2	c1. Provide a correct information to the health care team regarding therapeutic goals and therapeutic protocol and drug selection
14.		c2. Recommend drugs of first choice to the health care team.
15.	C4	c3 .Search efficiently for information using documented and electronic sources of information.
16.		c4. Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	d1. Share successfully in team-work.
18.	D2	d2. Show respect to lifeand commit to community and patients serving.

19.	D3	d3. Communicate effectively with his/her colleagues.
20.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
21.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture, feed-back learning	Written exam , Attendance, assignments
a3	Lecture	Written exam , Attendance
a4	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture	Written exam , Attendance,
b2, b3, b4	Lecture, feed-back learning	Written exam , Attendance, assignment
b5, b6	Lecture, feed-back learning	Written exam , Attendance, quizzes
b7, b8	Lecture, feed-back learning	Written exam , Attendance, quizzes
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	lecture	Written exam , Attendance
c3	feed-back learning, Group-project	Assignments
c4	Feed-back learning	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning	Teaching strategies	Assessment Strategies

Outcomes		
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	Feed-back learning	Assignments

IV. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>introduction to pharmacotherapy</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	<ul style="list-style-type: none"> <li>• Definition , history in brief</li> <li>• The need to pharmacotherapy : objectives,missions.</li> <li>• Role of pharmacists as pharmacotherapists: selection, designing therapeutic plans, recommendation of drugs to health care team</li> <li>• Therapeutic goals of diseases : definition, classification, how to determine</li> <li>• Pharamcotherapeutical classification of drugs : essential drugs (first choice, alternative), supportive , prophylactic, others</li> <li>• Drug selection : factors affecting , benefit/risk ratio: comparison of drug benefits to drug risks (limitations), review of drug benefits &amp; drug limitations (studied in pharmacology courses) other factors : patient case, availability, economy, etc.</li> <li>• Standard therapeutic protocols : international institutions of health e.g. WHO, FDA, NHS, associations of diseases (American association of diabetes, etc) local authority :ministry of public health</li> </ul>	2	4
Therapeutic goals, therapeutic protocols and drug selection (essential " (first choice, alternative), supportive , prophylactic for therapy of the following diseases/disorders					
2	<b>Alimentary system diseases/ disorders</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	Peptic ulcer , irritable-bowel syndrome, hepatic failure	2	4

3	<b>respiratory system diseases/ disorders</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	Bronchial asthma , cough	1	2
4	<b>CVS system diseases/ disorders</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	hypertension , angina, congestive heart failure.	2	4
<b>MID-TERM EXAM</b>				1	2
5	<b>Renal system diseases/ disorders</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c12,d2, d4	renal failure, patients on hemodialysis	2	4
6	<b>Endocrinologic diseases/ disorders</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	diabetes mellitus, thyroid disorders	2	4
7	<b>Microbial infections</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	bacteremia , septicemia, AIDS	2	4
<b>Course Review</b>		a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	Review and discussion session of the studied topics.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>					32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

VI. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve multiple choice questions provided by the teacher. The questions should focus on therapeutic goals, drug of choice, types of drug (essential, supportive, etc).	b2, b3, b4, c3, c4, d5	4-13	6
2	<b>Group :</b> each group of students will be assigned to provide a search-based report on international + local (if any) therapeutic protocol for treatment of diseases not included in the topics e.g. <ul style="list-style-type: none"> <li>• vomiting, diarrhea</li> <li>• Tuberculosis</li> <li>• Renal stone</li> <li>• Arrhythmia</li> <li>• Female i&amp; male infertility</li> <li>• Dingo fever</li> <li>• Urinary tract infections</li> <li>• Respiratory tract infections</li> </ul>	c3, c4, d1, d3,d4, d5	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2, d2, d4
2	Assignments (1 + 2)	4, 14	10	10	b2, b3, b4, c3, c4, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b6, b7
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, d2, d4
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, d2, d4
TOTAL			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Joseph D. Dipiro, pharmacotherapy: a pathological approach, 2005 McGraw-Hill Inc.
<b>2- Essential References.</b>
1. Wells. Pharmacotherapy hand book 2. Satoskar. Pharmacology and pharmacotherapeutics
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Protocol (Syllabus) of PHARMACOTHERAPY I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	Dr. Rashad Al-namer	Office Hours					
Location & Telephone No.	Pharmacy department ; 774871511	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
<p>The course deals with the study of the therapeutic goals, selection of drugs (first choices , alternatives, supportive) and the standard therapeutic protocols (plans) for treatment of common diseases . This course is complementary to pathophysiology and pharmacology I &amp; II courses and is supportive for clinical pharmacy , pharmacy practice skills, and integrated-case based learning" courses. The course concerns with drug therapy of disorders/diseases of alimentary, cardiovascular , renal systems, Endocrinologic disorders and infections.</p>

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A1	a1. Determine therapeutic goals during treating of diseases.
2.	A2	a2. Determine the appropriate drugs (first choices , alternatives and supportive) for treatment of diseases.
3.	A3	a3. Discuss the international (WHO, FDA or NHS or others) and the local (if any) therapeutic protocol for treatment of diseases.
4.	A4	a4. Comprehend his/her role as a pharmacist in defining therapeutic goals, selection of appropriate drugs and implementing therapeutic protocols for the favor of optimal treating of diseases.
5.	B2	b1. Differentiate between essential and supportive drugs for management of common diseases.
6.		b2 .Classify drugs to be used for management of common diseases into essential, prophylactic and supportive drugs.
7.		b3. Compare between drugs based on benefit/ risk ratio.
8.		b4. Relate the drug selection to case (patient), appropriateness, availability and other factors.
9.	B3	b5.Design a therapeutic protocol for treating common diseases.
10.		b6. Predict the expected risks of using a drug in treatment of common diseases.
11.	B4	b7 . Assess the appropriateness of drugs prescribed/recommended for management of diseases.
12.		b8. Select the drug of choice and other complementary drugs appropriately for management of common diseases.
13.	C2	c1. Provide a correct information to the health care team regarding therapeutic goals and therapeutic protocol and drug selection
14.		c2. Recommend drugs of first choice to the health care team.
15.	C4	c3 .Search efficiently for information using documented and electronic sources of information.
16.		c4. Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	d1. Share successfully in team-work.
18.	D2	d2. Show respect to lifeand commit to community and patients serving.

19.	D3	d3. Communicate effectively with his/her colleagues.
20.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
21.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

2. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture, feed-back learning	Written exam , Attendance, assignments
a3	Lecture	Written exam , Attendance
a4	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture	Written exam , Attendance,
b2, b3, b4	Lecture, feed-back learning	Written exam , Attendance, assignment
b5, b6	Lecture, feed-back learning	Written exam , Attendance, quizzes
b7, b8	Lecture, feed-back learning	Written exam , Attendance, quizzes
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	lecture	Written exam , Attendance
c3	feed-back learning, Group-project	Assignments
c4	Feed-back learning	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies

d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	Feed-back learning	Assignments

V. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>introduction to pharmacotherapy</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	<ul style="list-style-type: none"> <li>• Definition , history in brief</li> <li>• The need to pharmacotherapy : objectives,missions.</li> <li>• Role of pharmacists as pharmacotherapists: selection, designing therapeutic plans, recommendation of drugs to health care team</li> <li>• Therapeutic goals of diseases : definition, classification, how to determine</li> <li>• Pharamcotherapeutical classification of drugs : essential drugs (first choice, alternative), supportive , prophylactic, others</li> <li>• Drug selection : factors affecting , benefit/risk ratio: comparison of drug benefits to drug risks (limitations), review of drug benefits &amp; drug limitations (studied in pharmacology courses) other factors : patient case, availability, economy, etc.</li> <li>• Standard therapeutic protocols : international institutions of health e.g. WHO, FDA, NHS, associations of diseases (American association of diabetes, etc) local authority :ministry of public health</li> </ul>	2	4
Therapeutic goals, therapeutic protocols and drug selection (essential " (first choice, alternative), supportive , prophylactic for therapy of the following diseases/disorders					

2	<b>Alimentary system diseases/ disorders</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	Peptic ulcer , irritable-bowel syndrome, hepatic failure	2	4
3	<b>respiratory system diseases/ disorders</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	Bronchial asthma , cough	1	2
4	<b>CVS system diseases/ disorders</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	hypertension , angina, congestive heart failure.	2	4
<b>MID-TERM EXAM</b>				1	2
5	<b>Renal system diseases/ disorders</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c12,d2, d4	renal failure, patients on hemodialysis	2	4
6	<b>Endocrinologic diseases/ disorders</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	diabetes mellitus, thyroid disorders	2	4
7	<b>Microbial infections</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	bacteremia , septicemia, AIDS	2	4
<b>Course Review</b>		a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	Review and discussion session of the studied topics.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>					32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units

## VI. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the

student's brain through a group of questions &/or <b>Concepts map</b> : which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using <b>learning aids</b> such as Data show projector
<b>Feed-back learning</b> : students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
<b>Group projects</b> : students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

VII. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to solve multiple choice questions provided by the teacher. The questions should focus on therapeutic goals, drug of choice, types of drug (essential, supportive, etc).	b2, b3, b4, c3, c4, d5	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report on international + local (if any) therapeutic protocol for treatment of diseases not included in the topics e.g. <ul style="list-style-type: none"> <li>• vomiting, diarrhea</li> <li>• Tuberculosis</li> <li>• Renal stone</li> <li>• Arrhythmia</li> <li>• Female i&amp; male infertility</li> <li>• Dingo fever</li> <li>• Urinary tract infections</li> <li>• Respiratory tract infections</li> </ul>	c3, c4, d1, d3,d4, d5	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2 d2, d4
2	Assignments (1 + 2)	4, 14	10	10	b2, b3, b4, c3, c4, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b6, b7
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, d2, d4
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, d2, d4
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Joseph D. Dipiro, pharmacotherapy: a pathological approach, 2005 McGraw-Hill Inc.

### 2- Essential References.

1. Wells. Pharmacotherapy hand book
2. Satoskar. Pharmacology and pharmacotherapeutics

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1. **Class Attendance:** At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam

2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### PHARMACEUTICS III

<b>I. Course Identification and General Information:</b>						
1.	Course Title:	PHARMACEUTICS III				
2.	Course Code & Number:	PHRT 07				
3.	Credit hours:	C.H			TOTAL	
		Theoretical		P.		Tr.
		L.	Tut.			
		2	-	-		1
4.	Study level/ semester at which this course is offered:	<i>( THIRD ) Year – ( 2<sup>nd</sup> ) semester</i>				
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>Introduction to pharmacy profession</li> <li>Physical pharmacy</li> <li>Pharmaceutical calculation skills</li> <li>Pharmaceutics I. II</li> </ul>				
6.	Co –requisite (if any):	None				
7.	Program (s) in which the course is offered:	All BC programs offered by the university				
8.	Language of teaching the course:	ENGLISH				
9.	Location of teaching the course:	IN THE UNIVERSITY				
10	Prepared By:					
11	Date of Approval	<b>10/2014</b>				

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course deals with the study of pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explicit the general properties, advantages and disadvantages of pharmaceutical solid dosage forms including tablets and capsules and sterile dosage forms including parenteral and ophthalmic preparations .
2.	A1	a2. Discuss the principles, pharmacopeial requirements, methods of preparation, of various types of pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .
3.		a3. Explicit the types and roles of excipients included in different types of pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .
4.	A2	a4. Comprehend his/her role as pharmacist in formulation of pharmaceutical dosage forms.
5.	B1	b1. Calculate the amount of ingredient required to prepare an enlarged or reduced amount of a pharmaceutical formula.
6.	B2	b2 .Categorize pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .
7.		b3. Compare between various types of pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .
8.		b4. Relate the selection of excipients and the method of preparation of pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .to formulation, compatibility and stability factors.
9.	B3	b5. Formulate the active ingredient and excipients into an appropriate pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .
10.	B4	b6 . Assess the quality of the prepared pharmaceutical solid dosage forms including tablets and capsules and sterile ophthalmic preparations .
11.	C1	c1.Handle efficiently the tools and chemicals used in pharmaceutics

		Lab.
12.		c2. Operate successfully the instruments used in pharmaceuticals Lab.
13.	C2	c3. Prepare successfully pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms using standard procedures.
14.	C3	c4 .Take the required safety criteria during preparation pharmaceutical dosage forms in pharmaceuticals Lab.
15.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
16.		c6. Present and report his/her work correctly using appropriate writing rules and technologies media.
17.	D1	d1. Share successfully in team-work.
18.	D3	d2. Communicate effectively with his/her colleagues.
19.	D4	d3. Comply to pharmacy laws and ethics and behave in discipline during practical works.
20.	D5	d4. Demonstrate time management and self-learning skills during performing assignments and practical works.

2. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2, a3	Lecture	Written exam , Attendance
a4	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)

b2, b3, b4	Lecture	Written exam , Attendance, quizzes
b5	Lecture	Written exam , Attendance
b6	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	Feed-back learning, Group-project	Assignments
c6	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam), Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d2, d3	laboratory practice, Feed-back learning, group project	Practical assessment (Lab. attendance, attitude, practical exam), Assignments
d4	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) , Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Pharmaceutical solid dosage forms (Tablets)</b>	a1, a2, a3, a4, b2, b3, b4, b5	<input type="checkbox"/> Introduction <input type="checkbox"/> Advantages and disadvantages. <input type="checkbox"/> Types of compressed tablets. <input type="checkbox"/> Tableting methods <input type="checkbox"/> Direct compression <input type="checkbox"/> Dry granulation <input type="checkbox"/> Wet granulation <input type="checkbox"/> Technology of production of granules on large scale by various techniques. <input type="checkbox"/> Tablet excipients <input type="checkbox"/> Large scale production of tablets. <input type="checkbox"/> Tablet press machines <input type="checkbox"/> Problems encountered during tablet formulation. <input type="checkbox"/> Standards quality control tests for tablets. <input type="checkbox"/> Tablet coating <ul style="list-style-type: none"> <li>▪ Types of coating</li> <li>▪ Film forming materials</li> <li>▪ Common polymers used for tablet coating.</li> </ul>	4	8
2	<b>Pharmaceutical solid dosage forms (capsules)</b>	a1, a2, a3, a4, b2, b3, b4, b5	<b>(i) Hard gelatin capsules</b> <ul style="list-style-type: none"> <li>• Advantages and disadvantages</li> <li>• Composition of capsule shell</li> <li>• types of capsule fill</li> <li>• Selection of capsule size.</li> <li>• Excipients used in hard gelatin capsule formulation.</li> <li>• Enteric coating of capsules.</li> <li>• Capsule filling process.</li> <li>• Storage of hard gelatin capsules.</li> </ul>	3	6

			<p><b>(ii) Soft gelatin capsules</b></p> <ul style="list-style-type: none"> <li>• Advantage and disadvantages.</li> <li>• Capsule shell composition.</li> <li>• types of capsule fill</li> <li>• Shapes and sizes.</li> <li>• Soft gelatin capsule formulation.</li> <li>• capsule filling process</li> <li>• specific properties: O<sub>2</sub> impermeability, water content</li> </ul>		
<b>Mid-semester exam</b>				1	2
3	<p><b>Sterile pharmaceutical dosage forms</b> (Introduction)</p>	a1, a2, a3, a4, b2, b3, b4, b5	<p><b>Differences between sterile &amp; non-sterile dosage forms :</b></p> <ul style="list-style-type: none"> <li>• Definition of sterility, sterilization, preservation, pyrogenicity, pyrogen-free</li> <li>• Review of sterilization methods and preservation of dosage forms</li> <li>• Aseptic techniques</li> <li>• Sources of contamination and methods of prevention</li> <li>• Design of aseptic area , Laminar flow benches services and maintenance)</li> <li>• Isotonicity of sterile preparations and methods of adjustment</li> </ul>	1	2
4	<p><b>Sterile pharmaceutical dosage forms</b> (Parenteral preparations)</p>	a1, a2, a3, a4, b2, b3, b4, b5	<ul style="list-style-type: none"> <li>• Preformulation factors               <ul style="list-style-type: none"> <li>○ Route of administration of injection</li> <li>○ Water for injection</li> <li>○ Non-aqueous vehicles</li> </ul> </li> <li>• Formulation details               <ul style="list-style-type: none"> <li>○ types of parenteral preparations ( solutions, suspension, emulsions, powders) , factors affecting formulation : the vehicles, osmotic pressure, pH, specific gravity,</li> <li>○ Formulation of Infusion fluids</li> </ul> </li> </ul>	3	6

			<ul style="list-style-type: none"> <li>• Prefilling &amp; filling               <ul style="list-style-type: none"> <li>○ Types Containers (ampoules, vials) and closures selection</li> <li>○ Washing of containers and closures</li> <li>○ Filling and closing ampoules and vials</li> <li>○ Equipments for large scale manufacture and evaluation of particulate matter.</li> </ul> </li> </ul>		
5	<b>Sterile pharmaceutical dosage forms</b> (Ophthalmic preparations)	a1, a2, a3, a4, b2, b3, b4, b5	<ul style="list-style-type: none"> <li>• Anatomical features of the eye</li> <li>• Formulation , preparation , sterilization and preservation of Ophthalmic dosage forms : (Eye drops) : solution, suspension., Eye washes Ophthalmic semisolds ( ointments, creams, gels).</li> <li>• Filling</li> <li>• Examples of drugs used to treat certain eye diseases</li> <li>• Ocuserts : composition, formulation, use</li> </ul>	2	4
	<b>Course Review</b>	a1, a2, a3, a4, b2, b3, b4, b5	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Intended Learning Outcomes CILOs</b>
1.	Preparation of tablets using dry granulation method : paracetamol tablets	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2.	Preparation of tablets using wet granulation method : paracetamol tablets	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
3.	Preparation of tablets using wet granulation method : mefenamic acid tablets	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4.	Preparation of tablets using direct compression method : aspirin tablets	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
5.	film-coating of tablets mefenamic acid	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
6.	Preparation of hard gelatin capsules (Manual): aspirin	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
7.	Preparation of hard gelatin capsules (Manual): paracetamol	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
8.	Preparation of I.V. admixtures : DNS + vitamin C + vitamin B complex	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
9.	Preparation of parenteral solutions from parenteral powders : reconstitution of cefuroxime sodium vial	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
10.	Preparation of sterile NaCl eye wash.	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
PRACTICAL EXAM		1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.

The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to present a search report supported with images on 5 trade names (commercial preparations) of the studied dosage forms	c5, c6, d4	4-13	3
2	<b>Group</b> :every group is assigned to present an illustrating videos on lab. And industrial preparation of 3 types of studies dosage forms.	c5, c6, d1, d4	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, b2, b3, b4, b5
2	Assignments (1 + 2)	4, 14	5	5	c5, c6, d1, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a3, b2, b3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b2, b3, b4, b5
TOTAL			60	60 %	60

Practicalpart assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b6
6	Practical exam (practical)	14	20	20	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
Total			40	40 %	

## VIII. Learning Resources

<b>1- Required Textbook(s) ( maximum two ).</b>	
1.	Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone, UK
2.	Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA
<b>2- Essential References.</b>	
1.	Rawlins. Bentley s of text book of pharmaceutics
2.	Kasture pharmaceutics
3.	Raje. pharmaceutics
4.	Raph. practical pharmaceutics
<b>3- Electronic Materials and Web Sites etc.</b>	
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>	

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of PHARMACEUTICS II

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with the study of pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A2	a1. Explicit the general properties, advantages and disadvantages of pharmaceutical solid dosage forms including tablets and capsules and sterile dosage forms including parenteral and ophthalmic preparations .
2.	A1	a2. Discuss the principles, pharmacopeial requirements, methods of preparation, of various types of pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .
3.		a3. Explicit the types and roles of excipients included in different types of pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .
4.	A2	a4. Comprehend his/her role as pharmacist in formulation of pharmaceutical dosage forms.
5.	B1	b1. Calculate the amount of ingredient required to prepare an enlarged or reduced amount of a pharmaceutical formula.
6.	B2	b2 .Categorize pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .
7.		b3. Compare between various types of pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .
8.		b4. Relate the selection of excipients and the method of preparation of pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .to formulation, compatibility and stability factors.
9.	B3	b5. Formulate the active ingredient and excipients into an appropriate pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .
10.	B4	b6 . Assess the quality of the prepared pharmaceutical solid dosage forms including tablets and capsules and sterile ophthalmic preparations .
11.	C1	c1.Handle efficiently the tools and chemicals used in pharmaceuticals

		Lab.
12.		c2. Operate successfully the instruments used in pharmaceuticals Lab.
13.	C2	c3. Prepare successfully pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms using standard procedures.
14.	C3	c4 .Take the required safety criteria during preparation pharmaceutical dosage forms in pharmaceuticals Lab.
15.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
16.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	d1. Share successfully in team-work.
18.	D3	d2. Communicate effectively with his/her colleagues.
19.	D4	d3. Comply to pharmacy laws and ethics and behave in discipline during practical works.
20.	D5	d4. Demonstrate time management and self-learning skills during performing assignments and practical works.

2. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2, a3	Lecture	Written exam , Attendance
a4	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)

b2, b3, b4	Lecture	Written exam , Attendance, quizzes
b5	Lecture	Written exam , Attendance
b6	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	Feed-back learning, Group-project	Assignments
c6	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam), Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d2, d3	laboratory practice, Feed-back learning, group project	Practical assessment (Lab. attendance, attitude, practical exam), Assignments
d4	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) , Assignments

## V. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Pharmaceutical solid dosage forms (Tablets)</b>	a1, a2, a3, a4, b2, b3, b4, b5	<input type="checkbox"/> Introduction <input type="checkbox"/> Advantages and disadvantages. <input type="checkbox"/> Types of compressed tablets. <input type="checkbox"/> Tableting methods <input type="checkbox"/> Direct compression <input type="checkbox"/> Dry granulation <input type="checkbox"/> Wet granulation <input type="checkbox"/> Technology of production of granules on large scale by various techniques. <input type="checkbox"/> Tablet excipients <input type="checkbox"/> Large scale production of tablets. <input type="checkbox"/> Tablet press machines <input type="checkbox"/> Problems encountered during tablet formulation. <input type="checkbox"/> Standards quality control tests for tablets. <input type="checkbox"/> Tablet coating <ul style="list-style-type: none"> <li>▪ Types of coating</li> <li>▪ Film forming materials</li> <li>▪ Common polymers used for tablet coating.</li> </ul>	4	8
2	<b>Pharmaceutical solid dosage forms (capsules)</b>	a1, a2, a3, a4, b2, b3, b4, b5	<b>(i) Hard gelatin capsules</b> <ul style="list-style-type: none"> <li>• Advantages and disadvantages</li> <li>• Composition of capsule shell</li> <li>• types of capsule fill</li> <li>• Selection of capsule size.</li> <li>• Excipients used in hard gelatin capsule formulation.</li> <li>• Enteric coating of capsules.</li> <li>• Capsule filling process.</li> <li>• Storage of hard gelatin capsules.</li> </ul>	3	6



			<p><b>(ii) Soft gelatin capsules</b></p> <ul style="list-style-type: none"> <li>• Advantage and disadvantages.</li> <li>• Capsule shell composition.</li> <li>• types of capsule fill</li> <li>• Shapes and sizes.</li> <li>• Soft gelatin capsule formulation.</li> <li>• capsule filling process</li> <li>• specific properties: O<sub>2</sub> impermeability, water content</li> </ul>		
<b>Mid-semester exam</b>				1	2
3	<p><b>Sterile pharmaceutical dosage forms</b> (Introduction)</p>	a1, a2, a3, a4, b2, b3, b4, b5	<p><b>Differences between sterile &amp; non-sterile dosage forms :</b></p> <ul style="list-style-type: none"> <li>• Definition of sterility, sterilization, preservation, pyrogenicity, pyrogen-free</li> <li>• Review of sterilization methods and preservation of dosage forms</li> <li>• Aseptic techniques</li> <li>• Sources of contamination and methods of prevention</li> <li>• Design of aseptic area , Laminar flow benches services and maintenance)</li> <li>• Isotonicity of sterile preparations and methods of adjustment</li> </ul>	1	2
4	<p><b>Sterile pharmaceutical dosage forms</b> (Parenteral preparations)</p>	a1, a2, a3, a4, b2, b3, b4, b5	<ul style="list-style-type: none"> <li>• Preformulation factors               <ul style="list-style-type: none"> <li>○ Route of administration of injection</li> <li>○ Water for injection</li> <li>○ Non-aqueous vehicles</li> </ul> </li> <li>• Formulation details               <ul style="list-style-type: none"> <li>○ types of parenteral preparations ( solutions, suspension, emulsions, powders) , factors affecting formulation : the vehicles, osmotic pressure, pH, specific gravity,</li> <li>○ Formulation of Infusion fluids</li> </ul> </li> </ul>	3	6

			<ul style="list-style-type: none"> <li>• Prefilling &amp; filling               <ul style="list-style-type: none"> <li>○ Types Containers (ampoules, vials) and closures selection</li> <li>○ Washing of containers and closures</li> <li>○ Filling and closing ampoules and vials</li> <li>○ Equipments for large scale manufacture and evaluation of particulate matter.</li> </ul> </li> </ul>		
5	<b>Sterile pharmaceutical dosage forms</b> (Ophthalmic preparations)	a1, a2, a3, a4, b2, b3, b4, b5	<ul style="list-style-type: none"> <li>• Anatomical features of the eye</li> <li>• Formulation , preparation , sterilization and preservation of Ophthalmic dosage forms : (Eye drops) : solution, suspension., Eye washes Ophthalmic semisolids ( ointments, creams, gels).</li> <li>• Filling</li> <li>• Examples of drugs used to treat certain eye diseases</li> <li>• Ocuserts : composition, formulation, use</li> </ul>	2	4
	<b>Course Review</b>	a1, a2, a3, a4, b2, b3, b4, b5	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Intended Learning Outcomes CILOs</b>
1.	Preparation of tablets using wet granulation method : paracetamol tablets	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2.	Preparation of tablets using wet granulation method : mefenamic acid tablets	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
3.	Preparation of tablets using direct compression method : aspirin tablets	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4.	film-coating of tablets mefenamic acid	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
5.	Preparation of hard gelatin capsules (Manual): aspirin	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
6.	Preparation of hard gelatin capsules (Manual): paracetamol	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
7.	Preparation of I.V. admixtures : DNS + vitamin C + vitamin B complex	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
8.	Preparation of parenteral solutions from parenteral powders : reconstitution of cefuroxime sodium vial	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
9.	Preparation of Glycerin suppositories.	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
10.	Preparation of sterile NaCl eye wash.	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
PRACTICAL EXAM		1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.          The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to present a search report supported with images on 5 trade names (commercial preparations) of the studied dosage forms	c5, c6, d4	4-13	3
2	<b>Group</b> :every group is assigned to present an illustrating videos on lab. And industrial preparation of 3 types of studies dosage forms.	c5, c6, d1, d4	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, b2, b3, b4, b5
2	Assignments (1 + 2)	4, 14	5	5	c5, c6, d1, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a3, b2, b3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b2, b3, b4, b5
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b6
6	Practical exam (practical)	14	20	20	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
Total			40	40 %	

## VIII. Learning Resources

<b>1- Required Textbook(s) ( maximum two ).</b>	
1.	Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone, UK
2.	Ansel`s Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA
<b>2- Essential References.</b>	
1.	Rawlins. Bentley s of text book of pharmaceutics
2.	Kasture pharmaceutics
3.	Raje. pharmaceutics
4.	Raph. practical pharmaceutics
<b>3- Electronic Materials and Web Sites etc.</b>	
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>	

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PHARMACOLOGY III

I. Course Identification and General Information:						
1.	Course Title:	PHARMACOLOGY III				
2.	Course Code & Number:	PHRC 05				
3.	Credit hours:	C.H			TOTAL	
		Theoretical		P.		Tr.
		L.	Tut.			
		3	-	-		-
4.	Study level/ semester at which this course is offered:	( THIRD ) Year – ( 2 <sup>ND</sup> ) semester				
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>• General biology</li> <li>• Anatomy and histology</li> <li>• Physiology I &amp; II</li> <li>• Pathology</li> <li>• Pharmacology I &amp; II</li> </ul>				
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>• Medicinal chemistry III</li> </ul>				
7.	Program (s) in which the course is offered:	All BC programs offered by the university				
8.	Language of teaching the course:	ENGLISH				
9.	Location of teaching the course:	IN THE UNIVERSITY				
10	Prepared By:					
11	Date of Approval	10/2014				

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course also deals with the study of pharmacodynamic and pharmacokinetics of drugs affecting central nervous system (CNS) and chemotherapeutic drugs for infections and cancer.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A2	a1. Determine pharmacokinetics (absorption, distribution, metabolism and excretion) and drug benefits (therapeutic actions, indications, efficacy and potency) & drug posology of drugs affecting central nervous systems and chemotherapeutic drugs for infections and cancer.
2.		a2. Discuss drug limitations (side effects, contraindications, precautions, use in special patent categories and drug interactions) of drugs affecting central nervous systems and chemotherapeutic drugs for infections and cancer.
3.	A4	a3. Comprehend his/her role as a pharmacist in providing correct information on rational use of medications.
4.	B2	b1 .Classify drugs affecting central nervous systems and chemotherapeutic drugs for infections and cancer into various categories .
5.		b2. Compare between therapeutically related drugs based on drug benefits ( in particular efficacy and potency)and drug limitations.
6.		b3. Relate drug indications to MAO of drugs.
7.	B3	b4. Predict drug limitations on the basis of Drug MOA.
8.	B4	b5. Select an appropriate drug for patients based on drug benefits and limitation.
9.	C1	c1. Provide correct information on drug benefits and limitation.
10.	C2	c2 .Search efficiently for information using documented and electronic sources of information.
11.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
12.	D1	d1. Share successfully in team-work.
13.	D2	d2. Show respect to life.
14.	D3	d3. Demonstrate time management and self-learning during performing practical and professional works and assignments.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam , Attendance
a3	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3	Lecture	Written exam , Attendance, quizzes
b4	Lecture	Written exam , Attendance
b5	Lecture	Written exam , Attendance

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	lecture, feed-back learning	written exam, attendance, assignment
c2	feed-back learning, Group-project	Assignments
c3	laboratory practice	Practical assessment (Lab. attendance, reporting, practical exam)
c3	Feed-back learning Group-project	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance

d3	Feed-back learning	Assignments
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IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	CNS drugs	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<p><b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b></p> <ul style="list-style-type: none"> <li>• General anaesthetics</li> <li>• Sedatives, hypnotics and anticonvulsants.</li> <li>• Antiepileptics</li> <li>• Antipsychotics and antidepressants</li> <li>• Others</li> </ul> <p>note : narcotic analgesics was discussed in the previous semester in " Pharmacology II" course</p>	4	12
2	Chemotherapeutic drugsbacterial infections (Antibacterials)	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<p><b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b></p> <p><b>Antibacterials</b></p> <ul style="list-style-type: none"> <li>• antibiotics : (<math>\beta</math>-lactams: penicillins, cephalosporins, penems, others), macrolides, aminoglycosides, tetracyclines, chloramphenicols, lincosamides, others</li> <li>• Synthetic Antibacterials : sulphonamides, fluroquinolones, nitrothiazoles (e.g. metronidazole)</li> <li>• Antituberculars and antileprotics</li> <li>• Antiseptics and disinfectants</li> </ul>	3	9
<b>mid-term exam</b>				1	2
	Chemotherapeutic drugs for fungi and viruses infections		Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and	2	

3	(Antifungals& antivirals)		<b>comparison of :</b> <b>Antifungals (antimycotics)</b> <ul style="list-style-type: none"> <li>• Polyene antibiotics : nystatin, amphotericin B, griseofulvin</li> <li>• antimetabolites : flucytosine</li> </ul> azoles : clotrimazole, miconazoles, etc <b>Antivirals</b> <ul style="list-style-type: none"> <li>• anti-herpes simplex</li> <li>• anti-influenza</li> <li>• anti-AIDS</li> <li>• immunomodulators e.g. interferone</li> </ul>		6
	4	<b>Chemotherapeutic drugs for parasitic infections</b>		<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <b>Antiprotozoals</b> <ul style="list-style-type: none"> <li>• Antamoebics and anti giardials</li> <li>• Anti-leishmanials and anti-toxoplasmosis</li> <li>• Antimalarials</li> </ul> <b>Anthelmintics</b> <ul style="list-style-type: none"> <li>• For common worms infection</li> <li>• For tape worm : trematodes (taenia, H. nana) infections</li> <li>• For schistosoma (Bilharzia)infections</li> <li>• For filarisis</li> </ul>	1
5	<b>Chemotherapeutic drugs for cancer (Anticancers ; antineoplastic)</b>	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Antimetabolites : methotrexate, 5-flurouracil. 6-mercaptopurine</li> <li>• Alkylating agents: nitrogen mustards, alkyl sulphonates, nitrosurea</li> <li>• Natural products: antibiotics, plant alkaloids, enzymes, interferons</li> <li>• Hormones and hormones anatgonists</li> <li>• Radioactive isotopes</li> <li>• Miscellaneous: cisplatin, mitotane , etc</li> </ul>	3	9

Course Review	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	Review of the course topics by discussion session.	1	3
FINAL - EXAM			1	3
TOTAL			16	47
Number of Weeks /and Units Per Semester			16 week s	5 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

VI. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to prepare an index booklet of the drugs studied in the course. The index should contain the basic drug information on drug benefits and limitation.	c2, c3, d3	13	6
2	<b>Group :</b> each group of students will be assigned to provide a comparison chart on drugs of the same pharmacologic category. Comparison focuses on drug benefits and limitations.	b2, c2, c3, d1, d3	14	4

VII. Schedule of Assessment Tasks for Students During the Semester					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2
2	Assignments (1 + 2)	4, 14	10	10	b2, c2, c3, d1, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b3
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	, a3, b2, b3, b4, b5, c1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
<ol style="list-style-type: none"> <li>1. Katzung –Basic and Clinical Pharmacology, (2007), McGraw-Hill</li> <li>2. Rang, Dale and Ritter. Pharmacology, (2007), Churchill Livingstone.</li> </ol>
<b>2- Essential References.</b>
<ol style="list-style-type: none"> <li>1. Richard A. Harvey. Lippincott's pharmacology, 2000, Lippincott William and Wilkins.</li> <li>2. Udaykumar. Text book of medical pharmacology</li> </ol>
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of PHARMACOLOGY III

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	Pr.Dr.Rashad Alnamer	Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail	yemtiger1@yahoo.com						

II. Course Description:
The course also deals with the study of pharmacodynamic and pharmacokinetics of drugs affecting central nervous system (CNS) and chemotherapeutic drugs for infections and cancer.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A2	a1. Determine pharmacokinetics (absorption, distribution, metabolism and excretion) and drug benefits (therapeutic actions, indications, efficacy and potency) & drug posology of drugs affecting central nervous systems and chemotherapeutic drugs for infections and cancer.
2.		a2. Discuss drug limitations (side effects, contraindications, precautions, use in special patent categories and drug interactions) of drugs affecting central nervous systems and chemotherapeutic drugs for infections and cancer.
3.	A4	a3. Comprehend his/her role as a pharmacist in providing correct information on rational use of medications.
4.	B2	b1 .Classify drugs affecting central nervous systems and chemotherapeutic drugs for infections and cancer into various categories .
5.		b2. Compare between therapeutically related drugs based on drug benefits ( in particular efficacy and potency)and drug limitations.
6.		b3. Relate drug indications to MAO of drugs.
7.	B3	b4. Predict drug limitations on the basis of Drug MOA.
8.	B4	b5. Select an appropriate drug for patients based on drug benefits and limitation.
9.	C1	c1. Provide correct information on drug benefits and limitation.
10.	C2	c2 .Search efficiently for information using documented and electronic sources of information.
11.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
12.	D1	d1. Share successfully in team-work.
13.	D2	d2. Show respect to life.
14.	D3	d3. Demonstrate time management and self-learning during performing practical and professional works and assignments.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam , Attendance
a3	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3	Lecture	Written exam , Attendance, quizzes
b4	Lecture	Written exam , Attendance
b5	Lecture	Written exam , Attendance

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	lecture, feed-back learning	written exam, attendance, assignment
c2	feed-back learning, Group-project	Assignments
c3	laboratory practice	Practical assessment (Lab. attendance, reporting, practical exam)
c3	Feed-back learning Group-project	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance

d3	Feed-back learning	Assignments
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IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	CNS drugs	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• General anaesthetics</li> <li>• Sedatives, hypnotics and anticonvulsants.</li> <li>• Antiepileptics</li> <li>• Antipsychotics and antidepressants</li> <li>• Others</li> </ul> note : narcotic analgesics was discussed in the previous semester in " Pharmacology II" course	4	12
2	Chemotherapeutic drugs bacterial infections (Antibacterials)	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <p><b>Antibacterials</b></p> <ul style="list-style-type: none"> <li>• antibiotics : (<math>\beta</math>-lactams: penicillins, cephalosporins, penems, others), macrolides, aminoglycosides, tetracyclines, chloramphenicols, lincosamides, others</li> <li>• Synthetic Antibacterials : sulphonamides, fluroquinolones, nitrothiazoles (e.g. metronidazole)</li> <li>• Antituberculars and antileprotics</li> <li>• Antiseptics and disinfectants</li> </ul>	3	9
<b>mid-term exam</b>				1	2
	Chemotherapeutic drugs for fungi and viruses infections		<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and</b>	2	

3	(Antifungals& antivirals)		<b>comparison of :</b> <b>Antifungals (antimycotics)</b> <ul style="list-style-type: none"> <li>• Polyene antibiotics : nystatin, amphotericin B, griseofulvin</li> <li>• antimetabolites : flucytosine</li> </ul> azoles : clotrimazole, miconazoles, etc <b>Antivirals</b> <ul style="list-style-type: none"> <li>• anti-herpes simplex</li> <li>• anti-influenza</li> <li>• anti-AIDS</li> <li>• immunomodulators e.g. interferone</li> </ul>		6
	4	<b>Chemotherapeutic drugs for parasitic infections</b>		<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <b>Antiprotozoals</b> <ul style="list-style-type: none"> <li>• Antamoebics and anti giardials</li> <li>• Anti-leishmanials and anti-toxoplasmosis</li> <li>• Antimalarials</li> </ul> <b>Anthelmintics</b> <ul style="list-style-type: none"> <li>• For common worms infection</li> <li>• For tape worm : trematodes (taenia, H. nana) infections</li> <li>• For schistosoma (Bilharzia)infections</li> <li>• For filarisis</li> </ul>	1
5	<b>Chemotherapeutic drugs for cancer (Anticancers ; antineoplastic)</b>	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Antimetabolites : methotrexate, 5-flurouracil. 6-mercaptopurine</li> <li>• Alkylating agents: nitrogen mustards, alkyl sulphonates, nitrosurea</li> <li>• Natural products: antibiotics, plant alkaloids, enzymes, interferons</li> <li>• Hormones and hormones anatgonists</li> <li>• Radioactive isotopes</li> <li>• Miscellaneous: cisplatin, mitotane , etc</li> </ul>	3	9

Course Review	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	Review of the course topics by discussion session.	1	3
FINAL - EXAM			1	3
TOTAL			16	47
Number of Weeks /and Units Per Semester			16 week s	5 Units

## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to prepare an index booklet of the drugs studied in the course. The index should contain the basic drug information on drug benefits and limitation.	c2, c3, d3	13	6
2	<b>Group :</b> each group of students will be assigned to provide a comparison chart on drugs of the same pharmacologic category. Comparison focuses on drug benefits and limitations.	b2, c2, c3, d1, d3	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2
2	Assignments (1 + 2)	4, 14	10	10	b2, c2, c3, d1, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b3
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	, a3, b2, b3, b4, b5, c1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Katzung –Basic and Clinical Pharmacology, (2007), McGraw-Hill
2. Rang, Dale and Ritter. Pharmacology, (2007), Churchill Livingstone.

### 2- Essential References.

1. Richard A. Harvey. Lippincott's pharmacology, 2000, Lippincott William and Wilkins.
2. Udaykumar. Text book of medical pharmacology

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### INTEGRATED CASE-BASED LEARNING I

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	INTEGRATED CASE-BASED LEARNING I					
2.	Course Code & Number:	PHRT 09					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		-	-	2	-		-
4.	Study level/ semester at which this course is offered:	( <i>THIRD</i> ) Year – ( <i>2<sup>ND</sup></i> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>Physiology I &amp; II</li> <li>Pathology</li> <li>Pathophysiology</li> <li>Pharmacology I &amp; II</li> </ul>					
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>Clinical pharmacy I</li> <li>Pharmacotherapy I</li> </ul>					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course is designed to augment the course of clinical pharmacy (I) and pharmacotherapy (I) by seminar discussion of selected clinical cases.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A4	a1. Comprehend his/her role as a pharmacist in studying patient cases and solving case problems.
2.	B1	b1. Interpret clinical and investigational data.
3.	B2	b2. Solve patient-case problems including defining therapeutic goals, designing a therapeutic regimen, monitoring of drug therapy.
4.		b3. Relate between patient case data and drug selection.
5.	B3	b4. Design a therapeutic regimen to patient case.
6.		b5. Predict the outcomes of selected therapy.
7.	B4	b6. Select the appropriate drugs for each patient-case.
8.	C2	c1. Apply knowledge of pharmacology, pharmacotherapy and clinical pharmacy in studying patient cases.
9.		c2. Provide appropriate and effective recommendation to the health care team on drug selection.
10.		c3. Provide effective advices to patients to limit risk factors and to control his/her life style and diet in order to assist drug therapy.
11.	C4	c4. Present and report his/her works correctly using appropriate writing rules and technologies media.
12.	D1	d1. Share successfully in team-work.
13.	D2	d2. Show respect to life and commit to community and patients serving.
14.	D3	d3. Communicate effectively with his/her colleagues
15.	D5	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
b2	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
b3	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
b4, b5	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
b6	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 , c2, c3	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
c4	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)

<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1, d3</b>	<b>Seminar, feed-back learning, Group project</b>	<b>integrated-case base learning assessment (seminar r assessment + written exam)</b>
<b>d2</b>	<b>Seminar, feed-back learning, Group project</b>	<b>integrated-case base learning assessment (seminar r assessment + written exam)</b>
<b>d4</b>	<b>Seminar, feed-back learning, Group project</b>	<b>integrated-case base learning assessment (seminar r assessment + written exam)</b>

## IV. Course Content:

### Seminar Discussion , Presentation and Group system

- The students shall be divided into groups so as to comprehend all cases
- Each group will be assigned to study a given clinical case prepared by the teacher including several questions about the case.
- The group should study the case and answer the associated questions, and then make a seminar presentation in front of the teacher and the other students.
- The presentation should include:
  - Patient`s data
  - Clinical features and interpretation
  - Lab. and instrumental investigational data and interpretation
  - Assessment of drug therapy: suitability of drugs to the patient`s case, the source of drug therapy problem (if any), the need to change the therapy (if necessary).
- The teacher will prepare further questions about the case

Order	Units/ Topics List	CILOs	Clinical cases	No. of Weeks	contact hours
1	<b>Alimentary system diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Peptic ulcer</li> <li>• Irritable colon syndrome</li> </ul>	2	4
2	<b>Respiratory system diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Bronchial asthma</li> <li>• Tuberculosis</li> </ul>	2	4
3	<b>CVS diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Hypertension</li> <li>• Angina</li> </ul>	2	4
4	<b>Renal system diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Renal failure</li> </ul>	1	4
5	<b>Endocrinologic diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Diabetes mellitus</li> <li>• Thyroid disorder</li> </ul>	2	4
6	<b>Infective diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Toxoplasmosis</li> <li>• AIDS</li> </ul>	2	4
7	<b>Pregnant patients</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Constipation and vomiting</li> <li>• diabetes</li> <li>• hypertension</li> </ul>	1	2

8	<b>Lactating women Patients</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>mastitis</li> <li>lack of lactation</li> </ul>	1	2
9	<b>Pediatric patients</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>Sever Bacterial infection</li> <li>Dehydration</li> </ul>	1	2
10	<b>Geriatrics patients</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>B- blockers use in elderly patients</li> <li>Analgesics for rheumatism</li> </ul>	1	2
FINAL - EXAM				1	2
TOTAL				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	Units

## V. Teaching strategies of the course:

**Seminars:** these are mainly used with small groups of students (20-30) students in which they find better chances for discussing and participating in the teaching process.

**Feed-back learning:** students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	10	10	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, d1, d2, d3, d4
2	Seminar assessment	4, 14	30	30	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4
5	Final exam of theoretical part (written exam)	17	60	60	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4
<b>TOTAL</b>			100	100 %	100

The seminar weight will be assessed (for the students group as one unit) as follows:

Items	Weight	Aligned Course Learning Outcomes (CILOs)
Presentation	10 %	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, d1, d2, d3, d4
Solving of the Case study questions	20 %	
Discussion	10 %	
<b>Total</b>	<b>40 %</b>	

## VII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Soraya Dhillon, Rebekah Raymond, Pharmacy Case Studies, 2009, pharmaceutical press
<b>2- Essential References.</b>
2. Markus Muller, Clinical pharmacology: current topics and 3. case studies, 2010, Springer-Verlagl Wien 4. Yadav. Hand book of clinical pharmacy 5. Gillmer. 100 cases for students of medicine
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of INTEGRATED CASE-BASED LEARNING I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		<b>Office Hours</b>					
Location & Telephone No.	Pharmacy department ;	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
<p>The course is designed to augment the course of clinical pharmacy (I) and pharmacotherapy (I) by seminar discussion of selected clinical cases.</p>

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A4	a1. Comprehend his/her role as a pharmacist in studying patient cases and solving case problems.
2.	B1	b1. Interpret clinical and investigational data.
3.	B2	b2. Solve patient-case problems including defining therapeutic goals, designing a therapeutic regimen, monitoring of drug therapy.
4.		b3. Relate between patient case data and drug selection.
5.	B3	b4. Design a therapeutic regimen to patient case.
6.		b5. Predict the outcomes of selected therapy.
7.	B4	b6. Select the appropriate drugs for each patient-case.
8.	C2	c1. Apply knowledge of pharmacology, pharmacotherapy and clinical pharmacy in studying patient cases.
9.		c2. Provide appropriate and effective recommendation to the health care team on drug selection.
10.		c3. Provide effective advices to patients to limit risk factors and to control his/her life style and diet in order to assist drug therapy.
11.	C4	c4. Present and report his/her works correctly using appropriate writing rules and technologies media.
12.	D1	d1. Share successfully in team-work.
13.	D2	d2. Show respect to life and commit to community and patients serving.
14.	D3	d3. Communicate effectively with his/her colleagues
15.	D5	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.



<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>a1</b>	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>b1</b>	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
<b>b2</b>	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
<b>b3</b>	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
<b>b4, b5</b>	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
<b>b6</b>	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>c1 , c2, c3</b>	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
<b>c4</b>	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)

<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1, d3</b>	<b>Seminar, feed-back learning, Group project</b>	<b>integrated-case base learning assessment (seminar r assessment + written exam)</b>
<b>d2</b>	<b>Seminar, feed-back learning, Group project</b>	<b>integrated-case base learning assessment (seminar r assessment + written exam)</b>
<b>d4</b>	<b>Seminar, feed-back learning, Group project</b>	<b>integrated-case base learning assessment (seminar r assessment + written exam)</b>

## IV. Course Content:

### Seminar Discussion , Presentation and Group system

- The students shall be divided into groups so as to comprehend all cases
- Each group will be assigned to study a given clinical case prepared by the teacher including several questions about the case.
- The group should study the case and answer the associated questions, and then make a seminar presentation in front of the teacher and the other students.
- The presentation should include:
  - Patient`s data
  - Clinical features and interpretation
  - Lab. and instrumental investigational data and interpretation
  - Assessment of drug therapy: suitability of drugs to the patient`s case, the source of drug therapy problem (if any), the need to change the therapy (if necessary).
- The teacher will prepare further questions about the case

Order	Units/ Topics List	CILOs	Clinical cases	No. of Weeks	contact hours
1	<b>Alimentary system diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Peptic ulcer</li> <li>• Irritable colon syndrome</li> </ul>	2	4
2	<b>Respiratory system diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Bronchial asthma</li> <li>• Tuberculosis</li> </ul>	2	4
3	<b>CVS diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Hypertension</li> <li>• Angina</li> </ul>	2	4
4	<b>Renal system diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Renal failure</li> </ul>	1	4
5	<b>Endocrinologic diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Diabetes mellitus</li> <li>• Thyroid disorder</li> </ul>	2	4
6	<b>Infective diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Toxoplasmosis</li> <li>• AIDS</li> </ul>	2	4
7	<b>Pregnant patients</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Constipation and vomiting</li> <li>• diabetes</li> <li>• hypertension</li> </ul>	1	2

8	<b>Lactating women Patients</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>mastitis</li> <li>lack of lactation</li> </ul>	1	2
9	<b>Pediatric patients</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>Sever Bacterial infection</li> <li>Dehydration</li> </ul>	1	2
10	<b>Geriatrics patients</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>B- blockers use in elderly patients</li> <li>Analgesics for rheumatism</li> </ul>	1	2
FINAL - EXAM				1	2
TOTAL				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	Units

## V. Teaching strategies of the course:

**Seminars:** these are mainly used with small groups of students (20-30) students in which they find better chances for discussing and participating in the teaching process.

**Feed-back learning:** students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	10	10	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, d1, d2, d3, d4
2	Seminar assessment	4, 14	30	30	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4
5	Final exam of theoretical part ( written exam)	17	60	60	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4
<b>TOTAL</b>			100	100 %	100

The seminar weight will be assessed (for the students group as one unit) as follows:

Items	Weight	Aligned Course Learning Outcomes (CILOs)
Presentation	10 %	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, d1, d2, d3, d4
Solving of the Case study questions	20 %	
Discussion	10 %	
<b>Total</b>	<b>40 %</b>	

## VII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>	
1. Soraya Dhillon, Rebekah Raymond, Pharmacy Case Studies, 2009, pharmaceutical press	
<b>2- Essential References.</b>	
1. Markus Muller, Clinical pharmacology: current topics and 2. case studies, 2010, Springer-Verlagl Wien 3. Yadav. Hand book of clinical pharmacy 4. Gillmer. 100 cases for students of medicine	
<b>3- Electronic Materials and Web Sites etc.</b>	
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>	

## VIII. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PHYTOCHEMISTRY I

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	PHYTOCHEMISTRY I					
2.	Course Code & Number:	PHRG 04					
3.	Credit hours:	C.H					
		Theoretical			P.	Tr.	TOTAL
		L.	Tut.	S.			
		2	-	-	1	-	3
4.	Study level/ semester at which this course is offered:	( <i>THIRD</i> ) Year – ( 2 <sup>ND</sup> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General biology</li> <li>Botany</li> <li>General chemistry</li> <li>Organic chemistry</li> <li>Pharmaceutical organic chemistry</li> <li>Pharmacognosy I , II</li> </ul>					
6.	Co –requisite (if any):	none					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course deals with the study of physicochemical properties, extraction, isolation and identification of active chemical constituents (phytochemicals) obtained from medicinal plants in particular alkaloids and terpenoids.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Determine the botanical source and therapeutic uses of alkaloids and terpenoids phytochemicals.
2.	A2	a2. Determine the physicochemical properties of alkaloids and terpenoids phytochemicals.
3.	A3	a3. Discuss the methods and techniques used to extract and isolate phytochemicals
4.	A4	a4. Comprehend his/her role as a pharmacist in extraction, isolation and identification of phytochemicals.
5.	B1	b1. Express the chemical structure of phytochemicals using drawings.
6.		b2. Differentiate between various types of alkaloids and terpenoids.
7.		b3. Solve problems related to nomenclature, identification and differentiation of phytochemicals.
8.	B2	b4 .Classify alkaloids and terpenoids chemically and therapeutically
9.		b5. Compare between methods of extraction and isolation of phytochemicals based on their applications and efficiencies.
10.	B3	b6. Predict the outcomes of chemical reactions of alkaloids and terpenoids.
11.	B4	b7. Select the most appropriate technique for extraction and isolation of phytochemicals.
12.	C1	c1.Handle efficiently the tools and chemicals used in phytochemistry Lab.
13.		c2. Operate successfully the instruments used in phytochemistry Lab.
14.	C2	c3 . Perform effectively the experiments , practical tasks including extraction, identification and isolation of phytochemicals using standard procedures.
15.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.
16.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
17.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.



18.	D1	d1. Share successfully in team-work.
19.	D2	d2. Show respect to life.
20.	D3	d3. Communicate effectively with his/her colleagues.
21.	D4	d4. Behave in discipline during practicing practical and professional works and assignments.
22.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

2. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2	lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
a3	Lecture	Written exam , Attendance
a4	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture , feed-back learning laboratory practice	Written exam , Attendance, quizzes Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b4, b5	Lecture	Written exam , Attendance
b6	Lecture , feed-back learning	Written exam , Attendance,

		assignment, quizzes
b7	Lecture	Written exam , Attendance
<b>(C) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d3, d4	laboratory practice	Practical assessment (Lab. attendance, attitude, practical exam)
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice	Practical assessment (Lab. attendance, accomplishment, practical exam)
d5	Feed-back learning	Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to phytochemistry</b>	a2, a4 , b1, d2	<input type="checkbox"/> Definition, brief history, types (conventional, medicinal) <input type="checkbox"/> Scope of medicinal phytochemistry <input type="checkbox"/> Phytochemicals : Definition , evolution process, clarification, chemical classification , physicochemical properties	1	2
2	<b>Extraction of phytochemicals</b>	a3, a4, b7, d2	<b>Extraction techniques</b> <input type="checkbox"/> Maceration, percolation, soxhlet extractor: principle, apparatus, applications <input type="checkbox"/> Spouted bed extraction <input type="checkbox"/> Superficial fluid extraction <input type="checkbox"/> Solid-phase microextraction	2	4
3	<b>Separation and isolation of phytochemicals</b>	a3, b5, b7, d2	<b>Theoretical principle and components , components interactions , types, instrumentation, factors affecting, output data, applications in quantitative/qualitative analysis of :</b> <ul style="list-style-type: none"> <li>• <b>Sublimation , Distillation , Fractional liberation , Fractional crystallization</b> : principle, apparatus, applications</li> <li>• <b>Solid-phase Extraction:</b> adsorbants, principle, apparatus, applications</li> <li>• <b>Chromatography</b>            introduction and definitions, principle, brief history, types and selection of stationary phase and mobile phase, general factors affecting separation, adsorption chromatography, partition chromatography           <ul style="list-style-type: none"> <li>○ <b>simple chromatographic techniques:</b> principle , procedures (mobile, stationary phase, flow rate), illustrative examples and applications of</li> </ul> </li> </ul>	3	6

			<ul style="list-style-type: none"> <li>❖ Paper chromatography</li> <li>❖ Thin layer chromatography (TLC) and HPTLC</li> <li>❖ Column chromatography</li> <li>❖ Gel-filtration chromatography</li> </ul>		
MID-TERM EXAM				1	2
4	<b>Alkaloids</b>	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2	<ul style="list-style-type: none"> <li>○ Introduction: definition, history, occurrence, classification, nomenclature, physical and chemical properties, isolation, purification and detection.</li> <li>○ Phenylalkylamine alkaloids (ephedrine, cathinone and capsaicinoids)</li> <li>○ Isoquinoline alkaloids (papaverine, morphine, codeine and emetine)</li> <li>○ Tropane alkaloids (atropine and scopolamine)</li> <li>○ Amaryllidacean alkaloids (lycorine and galanthamine)</li> <li>○ Alkaloids derived from tryptophan</li> <li>○ Indole alkaloids (physostigmine, carboline, ergoline, ajmalicine, yohimbine, ajmaline and strychnine type)</li> <li>○ Chinoline alkaloids (cinchona alkaloids)</li> <li>○ Alkaloids derived from histidine: (pilocarpine, isopilocarpine and pilosine)</li> <li>○ Alkaloids derived from asparagine: (ricinine and nicotine alkaloids)</li> <li>○ Alkaloids derived from lysine</li> <li>○ piperidine alkaloids (piper, lobelia and pomegranate alkaloids)</li> <li>○ chinolizidine alkaloids (lupinine, sparteine and cytosine)</li> <li>○ Alkaloids derived from ornithine: tropane alkaloids (atropine, hyoscyamine, scopolamine and cocaine) chinazoline alkaloids (tetradoxine)</li> <li>○ Alkaloids derived from glycine: purine alkaloids (caffeine, theophylline and theobromine) terpen alkaloids (monoterpen, sesquiterpen and</li> </ul>	4	8

			diterpen alkaloids)		
5	<b>Terpenoids</b>	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2	<ul style="list-style-type: none"> <li>○ Introduction (definition,classification,biosynthesis and distribution)</li> <li>○ Monoterpens (regular and irregular monoterpenoids,iridoids,structures,chemical and physical properties and drugs containing monoterpenoids)</li> <li>○ Sequiterpens and sequiterpens lactones(structures,chemical and biological properties and drug containing sequiterpens and sequiterpens lactones)</li> <li>○ Diterpenes( structures,chemical and biological properties and drug containing diterpenes)</li> <li>○ Triterpenes(classification,structures and drug containing triterpenes)</li> <li>○ Tetraterpenes(chemical and biological properties,vitamin A and drug containing tetraterpenes).</li> </ul>	3	6
	<b>Course Review</b>	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs
physicochemical properties , extraction (maceration or percolation or soxhlet extraction ) , concentration (if necessary " rotary evaporation', isolation (Thin layer chromatography) and identification of the phytochemicals from crude drugs or parts of medicinal plants				
1.	alkaloids (Caffeine )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
2.	alkaloids (Theophylline)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
3.	alkaloids (cathinone)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
4.	alkaloids ( <u>Trigonelline</u> )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
5.	alkaloids ( <u>vincristine</u> )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
6.	alkaloids (Capsaicin)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
7.	Terpenoids : ( Prenol)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
8.	Terpenoids : ( Eucalytol)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
9.	Terpenoids : ( Retinol)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
10.	Terpenoids : ( squalane )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
11.	Review		2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit</b>	

		hours	
Number of Weeks		12	

## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Laboratory practice**: students doing experiments in labs individually or in small groups
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : each student will be assigned solve the problems provided by the teacher. The problems involve nomenclature, isolation , chemical reaction, etc.	b3, b6., c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to present 2-3 videos or simulations of one of the studied extraction , isolation techniques.	c5, c6, d1, d3, d5	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2
2	Assignments (1 + 2)	4, 14	5	5	b3, b6, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	3	3	b2, b3, b6
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a2, a3, a4 , b1, b5 b7, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
6	Practical exam (practical)	14	20	20	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
Total			40	40 %	



## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
<ol style="list-style-type: none"> <li>1. W.C. Evans, Trease and Evans pharmacognosy, 2009, W.B.Saunders</li> <li>2. Amritpal Singh Saroya, Herbalism, Phytochemistry and Ethnopharmacology, 2011, CRC press Jarald.</li> </ol>
<b>2- Essential References.</b>
<ol style="list-style-type: none"> <li>3. Bhandari. Textbook of pharmacognosy</li> </ol>
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of PHYTOCHEMISTRY I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

### II. Course Description:

The course deals with the study of physicochemical properties, extraction, isolation and identification of active chemical constituents (phytochemicals) obtained from medicinal plants in particular alkaloids and terpenoids.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 3. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Determine the botanical source and therapeutic uses of alkaloids and terpenoids phytochemicals.
2.	A2	a2. Determine the physicochemical properties of alkaloids and terpenoids phytochemicals.
3.	A3	a3. Discuss the methods and techniques used to extract and isolate phytochemicals
4.	A4	a4. Comprehend his/her role as a pharmacist in extraction, isolation and identification of phytochemicals.
5.	B1	b1. Express the chemical structure of phytochemicals using drawings.
6.		b2. Differentiate between various types of alkaloids and terpenoids.
7.		b3. Solve problems related to nomenclature, identification and differentiation of phytochemicals.
8.	B2	b4 .Classify alkaloids and terpenoids chemically and therapeutically
9.		b5. Compare between methods of extraction and isolation of phytochemicals based on their applications and efficiencies.
10.	B3	b6. Predict the outcomes of chemical reactions of alkaloids and terpenoids.
11.	B4	b7. Select the most appropriate technique for extraction and isolation of phytochemicals.
12.	C1	c1.Handle efficiently the tools and chemicals used in phytochemistry Lab.
13.		c2. Operate successfully the instruments used in phytochemistry Lab.
14.	C2	c3 . Perform effectively the experiments , practical tasks including extraction, identification and isolation of phytochemicals using standard procedures.
15.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.
16.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
17.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.

18.	D1	d1. Share successfully in team-work.
19.	D2	d2. Show respect to life.
20.	D3	d3. Communicate effectively with his/her colleagues.
21.	D4	d4. Behave in discipline during practicing practical and professional works and assignments.
22.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

4. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2	lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
a3	Lecture	Written exam , Attendance
a4	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture , feed-back learning laboratory practice	Written exam , Attendance, quizzes Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b4, b5	Lecture	Written exam , Attendance
b6	Lecture , feed-back learning	Written exam , Attendance,

		assignment, quizzes
b7	Lecture	Written exam , Attendance
<b>(C) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d3, d4	laboratory practice	Practical assessment (Lab. attendance, attitude, practical exam)
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice	Practical assessment (Lab. attendance, accomplishment, practical exam)
d5	Feed-back learning	Assignments

## V. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to phytochemistry</b>	a2, a4 , b1, d2	<ul style="list-style-type: none"> <li><input type="checkbox"/> Definition, brief history, types (conventional, medicinal)</li> <li><input type="checkbox"/> Scope of medicinal phytochemistry</li> <li><input type="checkbox"/> Phytochemicals : Definition , evolution process, clarification, chemical classification , physicochemical properties</li> </ul>	1	2
2	<b>Extraction of phytochemicals</b>	a3, a4, b7, d2	<p><b>Extraction techniques</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Maceration, percolation, soxhlet extractor: principle, apparatus, applications</li> <li><input type="checkbox"/> Spouted bed extraction</li> <li><input type="checkbox"/> Superficial fluid extraction</li> <li><input type="checkbox"/> Solid-phase microextraction</li> </ul>	2	4
3	<b>Separation and isolation of phytochemicals</b>	a3, b5, b7, d2	<ul style="list-style-type: none"> <li>• <b>Sublimation , Distillation , Fractional liberation , Fractional crystallization</b> : principle, apparatus, applications</li> <li>• <b>Chromatography</b> principle, brief history, types and selection of stationary phase and mobile phase, general factors affecting separation, adsorption chromatography, partition chromatography                             <ul style="list-style-type: none"> <li>○ <b>simple chromatographic techniques:</b> principle , procedures (mobile, stationary phase, flow rate), illustrative examples and applications of                                     <ul style="list-style-type: none"> <li>❖ Paper chromatography</li> <li>❖ Thin layer chromatography (TLC)</li> <li>❖ Column chromatography</li> </ul> </li> </ul> </li> </ul>	3	6
<b>MID-TERM EXAM</b>				1	2

4	<b>Alkaloids</b>	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2	<ul style="list-style-type: none"> <li>○ Introduction: definition, history, occurrence, classification, nomenclature, physical and chemical properties, isolation, purification and detection.</li> <li>○ □ Phenylalkylamine alkaloids (ephedrine, cathinone and capsaicinoids)</li> <li>○ Isocholin alkaloids (papaverine, morphine, codeine and emetine)</li> <li>○ Tropolon alkaloids (colchicines and demecolcine)</li> <li>○ Amaryllidacean alkaloids (lycorine and galanthamin)</li> <li>○ Alkaloids derived from tryptophan</li> <li>○ Indol-alkaloids (physostigmine, carboline, ergoline, ajmalicine, yohimbine, ajmaline and strychnine type)</li> <li>○ Chinoline alkaloids (cinchona alkaloids)</li> <li>○ Alkaloids derived from histidine: (pilocarpine, isopilocarpine and pilosine)</li> <li>○ Alkaloids derived from asparagic acid: (ricinine and nicotine alkaloids)</li> <li>○ Alkaloids derived from lysine piperidine alkaloids (piper, lobelia and pomegranate alkaloids)</li> <li>○ chinolizidine alkaloids (lupinine, sparteine and cytosine)</li> <li>○ Alkaloids derived from ornithine: tropan alkaloids (atropine, hyoscyamine, scopolamine and cocaine) chinazoline alkaloids (tetradoxine)</li> <li>○ Alkaloids derived from glycine: purine alkaloids (caffeine, theophylline and theobromine) terpen alkaloids (monoterpen, sesquiterpen and diterpen alkaloids)</li> </ul>	4	8
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5	<b>Terpenoids</b>	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2	<ul style="list-style-type: none"> <li>○ Introduction (definition,classification,biosynthesis and distribution)</li> <li>○ Monoterpens (regular and irregular monoterpenoids,iridoids,structures,chemical and physical properties and drugs containing monoterpenoids)</li> <li>○ Sequiterpens and sequiterpens lactones(structures,chemical and biological properties and drug containing sequiterpens and sequiterpens lactones)</li> <li>○ Diterpenes( structures,chemical and biological properties and drug containing diterpenes)</li> <li>○ Triterpenes(classification,structures and drug containing triterpenes)</li> <li>○ Tetraterpenes(chemical and biological properties,vitamin A and drug containing tetraterpenes).</li> </ul>	3	6
	<b>Course Review</b>	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units



<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs
physicochemical properties , extraction (maceration or percolation or soxhlet extraction ) , concentration (if necessary " rotary evaporation', isolation (Thin layer chromatography) and identification of the phytochemicals from crude drugs or parts of medicinal plants				
12.	alkaloids (Caffeine )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
13.	alkaloids (Theophylline)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
14.	alkaloids (cathinone)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
15.	alkaloids ( <u>Trigonelline</u> )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
16.	alkaloids ( <u>vincristine</u> )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
17.	alkaloids (Capsaicin)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
18.	Terpenoids : ( Prenol)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
19.	Terpenoids : ( Eucalytol)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
20.	Terpenoids : ( Retinol)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
21.	Terpenoids : ( squalane )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
22.	Review		2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.          The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : each student will be assigned solve the problems provided by the teacher. The problems involve nomenclature, isolation , chemical reaction, etc.	b3, b6., c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to present 2-3 videos or simulations of one of the studied extraction , isolation techniques.	c5, c6, d1, d3, d5	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2
2	Assignments (1 + 2)	4, 14	5	5	b3, b6, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	3	3	b2, b3, b6
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a2, a3, a4 , b1, b5 b7, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
6	Practical exam (practical)	14	20	20	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. W.C. Evans, Trease and Evans pharmacognosy, 2009, W.B.Saunders
2. Amritpal Singh Saroya, Herbalism, Phytochemistry and Ethnopharmacology, 2011, CRC press Jarald.

### 2- Essential References.

1. Bhandari. Textbook of pharmacognosy

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PHARMACEUTICAL INSTRUMENTAL ANALYSIS II

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	PHARMACEUTICAL INSTRUMENTAL ANALYSIS II					
2.	Course Code & Number:	PHRM 07					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( Third ) Year – ( 2 <sup>nd</sup> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General chemistry</li> <li>Analytical chemistry</li> <li>Pharmaceutical instrumental analysis I</li> </ul>					
6.	Co –requisite (if any):	none					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course deals with the study of essential principles, instrumentation and pharmaceutical applications of instrumental analytical techniques including electrochemical, thermal, particle-size and optical techniques.

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A2	a1. Explicit the physicochemical properties of matters that are used as basis for qualitative and quantitative instrumental analysis.
2.	A3	a2. Discuss the principles, instrumentations and pharmaceutical applications of electrochemical, thermal, particle-size and optical instrumental analytical techniques.
3.		a3. Explicit the advantages of instrumental techniques over manual classical techniques.
4.	A4	a4. Comprehend his/her role as a pharmacist in providing precise and accurate analytical results based on implementing strict standard operative and analytical procedures.
5.	B1	b1. Interpret correctly outcome data of an instrumental analysis.
6.		b2. Solve problems related to the studied instrumental analytical techniques including identification and/or quantitation of test samples.
7.	B2	b3. Classify instrumental analytical techniques based on their principles and applications.
8.		b4. Compare between various types of instrumental analytical techniques.
9.	B4	b5. Assess the accuracy and precision of an instrumental analytical techniques.
10.		b6. Select the appropriate technique to perform an instrumental quantitative/qualitative analysis.
11.	C1	c1. Handle efficiently the tools and chemicals used in pharmaceutical instrumental analysis Lab.
12.		c2. Operate successfully the instruments used in pharmaceutical instrumental analysis Lab.
13.	C2	c3. Perform effectively the experiments and practical tasks including qualitative and quantitative analysis of substances in a given sample using standard procedures.
14.	C3	c4. Take the required safety criteria during performing different types of practical and professional pharmacy works.
15.	C4	c5. Search efficiently for information using documented and electronic sources of information.

16.		<b>c6.</b> Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	<b>D1</b>	<b>d1.</b> Share successfully in team-work.
18.	<b>D2</b>	<b>d2.</b> Communicate effectively with his/her colleagues.
19.	<b>D3</b>	<b>d3.</b> Behave in discipline during practicing practical and professional works and assignments.
20.	<b>D4</b>	<b>d4.</b> Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2, a3	Lecture	Written exam , Attendance
a4	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b2	Lecture laboratory practice Feed-back learning	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam) Assignments , quizzes
b3, b4	Lecture	Written exam , Attendance

b5, b6	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
<b>(C) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d2, d3	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Electrochemical instrumental analysis</b>	a1, a2 , a4, b1, b2, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• <b>Electrogravimetric analysis:</b> Theory of electroanalysis, polarizatuon, decomposition, potential and over voltage electrolytic determination at constant current and with controlled potential at the cathode.</li> <li>• <b>Conductometry:</b> experimental details of conductometric titration and applications.</li> <li>• <b>Potentiometry:</b> Principles, methods and application.</li> <li>• <b>Amperometry:</b> theory and technique of amperometric titration with dropping mercury electrode, high frequency titration, its applications.</li> <li>• <b>Polarographic analysis:</b> Introduction, principles, diffusion current and half wave potential, quantitative techniques.</li> </ul>	5	10
<b>MID-TERM EXAM</b>				1	2

2	<b>Thermal instrumental analysis</b>	a1, a2, a4, b1, b2, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• <b>Thermogravimetry:</b> principle, instrumentation, temperature, verification, verification of electrobalance, procedures.</li> <li>• <b>Differential scanning calorimetry (DSC):</b> principles, instrumentation, calibration of equipments, procedures, phase change, applications, determination of purity</li> <li>• <b>Melting point tester :</b>Principle, instrumentation, procedures, applications</li> <li>• <b>Thermomicroscopy:</b> principle, apparatus, applications</li> <li>• <b>Freezing point tester :</b>Principle, purpose, apparatus</li> <li>• <b>Determination of Distillation Range :</b> Principle, purpose, apparatus, procedures, applications</li> </ul>	4	8
3	<b>Particle size and morphology analysis</b>	a1, a2, a4, b1, b2, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• <b>Analysis of particle size by laser light diffraction</b> <ul style="list-style-type: none"> <li>• Definitions and non-instrumental methods for particle size analysis.laser light diffraction: Principle, apparatus, procedures,measurement of particle size of dispersed samples, conversion of scattering pattern into particle-size distribution</li> </ul> </li> <li>• <b>Determination of particle morphology (crystallinity)</b> Definition and significance of crystallinity, <b>X-ray powder diffraction</b> for determination of crystallinity: Principle, apparatus, procedures , <b>Other methods:</b> microcalorimetry, solution calorimetry, thermal analysis</li> </ul>	3	6
4	<b>Optical instrumental analysis</b>	a1, a2, a4, b1, b2, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• <b>Flow cyometry:</b> Principle, apparatus, procedures, applications</li> <li>• <b>Polarimetry: Determination of optical and specific optical rotation:</b> Principle, purpose, apparatus, procedures,</li> </ul>	2	4

			<ul style="list-style-type: none"> <li>• <b>Determination of refractive index:</b> Principle, purpose, apparatus, procedures</li> </ul>		
<b>Course Review</b>	a1, a2, a4, b1, b2, b3, b7, b4, b5, b6, d2	Review of the course topics by discussion session.	1	2	
FINAL - EXAM			1	2	
<b>TOTAL</b>			16	32	
<b>Number of Weeks /and Units Per Semester</b>			16 weeks	4 Units	

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Intended Learning Outcomes CLOs</b>
1.	introduction to pharmaceutical instrumental analysis Lab.: safety requirements, list of experiments, How to report, etc.	1	2	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
2.	Potentiometric titration of drugs : diclofenac sodium	1	2	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
3.	Potentiometric titration of drugs : dextromethorphan HBr	1	2	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
4.	Polarographic analysis	1	2	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
5.	Melting point analysis	1	2	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
6.	Determination of Distillation Range	1	2	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
7.	Calorimetry of solutions	1	2	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4

8.	Polarimetric analysis of specific rotation	1	2	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
9.	Analysis of refractive index	2	4	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
10.	Review	1	2	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Laboratory practice**: students doing experiments in labs individually or in small groups
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
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1	<b>Individual:</b> every student is assigned to solve the problems provided by the teacher at the end of each unit.	b2, c5, c6, d4	4-13	3
2	<b>Group :</b> each group of students will be assigned to provide a video of simulation of one of the analytical technique studied. The students of each group must explain the simulation for other students.	c5, c6, d1, d2, d4	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2 , a4, b1, b2, b3 b4,b7, b5, b6, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b2, c5, c6, d1, d2, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b1, b2
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a1, a2 , a4, b1, b2, b3 b4,b7, b5, b6, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2 , a4, b1, b2, b3 b4,b7, b5, b6, d2
TOTAL			60	60 %	60

Practicalpart assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, , b1, b2, b1, b2, b5, b6,

					c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
2	Lab. Attitude	weekly	2	2	c4, d1, d2, d3
3	Lab. Accomplishments	weekly	5	5	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d4
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, b1, b2, b1, b2, b5, b6
6	Practical exam (practical)	14	20	20	a1, a2, , b1, b2, b1, b2, b5, b6, c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. David Harvey, modern analytical chemistry, 2000, McGraw-Hill
2. British pharmacopeia 2013

### 2- Essential References.

1. Hadkar. Instrumental methods in pharmaceutical analysis
2. Purcell. Pharmaceutical analysis

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1. **Class Attendance:** At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2. **Tardy:** any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3. **Exam Attendance/Punctuality:** any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4. **Assignments & Projects:** Assignments and projects will be assessed individually unless the teacher request for group

	work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of

### PHAMACEUTICAL INSTRUMENTAL ANALYSIS II

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

### II. Course Description:

The course deals with the study of essential principles, instrumentation and pharmaceutical applications of instrumental analytical techniques including electrochemical, thermal, particle-size and optical techniques.

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A2	a1. Explicit the physicochemical properties of matters that are used as basis for qualitative and quantitative instrumental analysis.
2.	A3	a2. Discuss the principles, instrumentations and pharmaceutical applications of electrochemical, thermal, particle-size and optical instrumental analytical techniques.
3.		a3. Explicit the advantages of instrumental techniques over manual classical techniques.
4.	A4	a4. Comprehend his/her role as a pharmacist in providing precise and accurate analytical results based on implementing strict standard operative and analytical procedures.
5.	B1	b1. Interpret correctly outcome data of an instrumental analysis.
6.		b2. Solve problems related to the studied instrumental analytical techniques including identification and/or quantitation of test samples.
7.	B2	b3. Classify instrumental analytical techniques based on their principles and applications.
8.		b4. Compare between various types of instrumental analytical techniques.
9.	B4	b5. Assess the accuracy and precision of an instrumental analytical techniques.
10.		b6. Select the appropriate technique to perform an instrumental quantitative/qualitative analysis.
11.	C1	c1. Handle efficiently the tools and chemicals used in pharmaceutical instrumental analysis Lab.
12.		c2. Operate successfully the instruments used in pharmaceutical instrumental analysis Lab.
13.	C2	c3. Perform effectively the experiments and practical tasks including qualitative and quantitative analysis of substances in a given sample using standard procedures.
14.	C3	c4. Take the required safety criteria during performing different types of practical and professional pharmacy works.
15.	C4	c5. Search efficiently for information using documented and electronic sources of information.

16.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	d1. Share successfully in team-work.
18.	D2	d2. Communicate effectively with his/her colleagues.
19.	D3	d3. Behave in discipline during practicing practical and professional works and assignments.
20.	D4	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

2. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2, a3	Lecture	Written exam , Attendance
a4	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b2	Lecture laboratory practice Feed-back learning	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam) Assignments , quizzes
b3, b4	Lecture	Written exam , Attendance

b5, b6	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
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**(C) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments

**V. Course Content:**

**A – Theoretical Aspect:**

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
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1	<b>Electrochemical instrumental analysis</b>	a1, a2, a4, b1, b2, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• <b>Electrogravimetric analysis:</b> Theory of electroanalysis, polarizatuon, decomposition, potential and over voltage electrolytic determination at constant current and with controlled potential at the cathode.</li> <li>• <b>Conductometry:</b> experimental details of conductometric titration and applications.</li> <li>• <b>Potentiometry:</b> Principles, methods and application.</li> <li>• <b>Amperometry:</b> theory and technique of amperometric titration with dropping mercury electrode, high frequency titration, its applications.</li> <li>• <b>Polarographic analysis:</b> Introduction, principles, diffusion current and half wave potential, quantitative techniques.</li> </ul>	4	10
<b>MID-TERM EXAM</b>				1	2
2	<b>Thermal instrumental analysis</b>	a1, a2, a4, b1, b2, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• <b>Thermogravimetry:</b> principle, instrumentation, temperature, verification, verification of electrobalance, procedures.</li> <li>• <b>Differential scanning calorimetry (DSC):</b> principles, instrumentation, calibration of equipments, procedures, phase change, applications, determination of purity</li> <li>• <b>Melting point tester:</b> Principle, instrumentation, procedures, applications</li> <li>• <b>Thermomicroscopy:</b> principle, apparatus, applications</li> <li>• <b>Freezing point tester:</b> Principle, purpose, apparatus</li> <li>• <b>Determination of Distillation Range :</b> Principle, purpose, apparatus, procedures, applications</li> </ul>	3	6

3	<b>Particle size and morphology analysis</b>	a1, a2, a4, b1, b2, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• <b>Analysis of particle size by laser light diffraction</b> <ul style="list-style-type: none"> <li>• Definitions and non-instrumental methods for particle size analysis.laser light diffraction: Principle, apparatus, procedures,measurement of particle size of dispersed samples, conversion of scattering pattern into particle-size distribution</li> </ul> </li> <li>• <b>Determination of particle morphology (crystallinity)</b> <ul style="list-style-type: none"> <li>Definition and significance of crystallinity, <b>X-ray powder diffraction</b> for determination of crystallinity: Principle, apparatus, procedures , <b>Other methods:</b> microcalorimetry, solution calorimetry, thermal analysis</li> </ul> </li> </ul>	2	4
4	<b>Optical instrumental analysis</b>	a1, a2, a4, b1, b2, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• <b>Flow cyometry:</b> Principle, apparatus, procedures, applications</li> <li>• <b>Polarimetry: Determination of optical and specific optical rotation:</b> Principle, purpose, apparatus, procedures,</li> <li>• <b>Determination of refractive index:</b> Principle, purpose, apparatus, procedures</li> </ul>	2	4
<b>Course Review</b>		a1, a2, a4, b1, b2, b3, b7, b4, b5, b6, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	4 Units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Intended Learning Outcomes CILOs</b>
1.	introduction to pharmaceutical instrumental analysis Lab.: safety requirements, list of experiments, How to report, etc.	1	2	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
2.	Potentiometric titration of drugs : diclofenac sodium	1	2	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
3.	Potentiometric titration of drugs : dextromethorphan HBr	1	2	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
4.	Polarographic analysis	1	2	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
5.	Melting point analysis	1	2	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
6.	Determination of Distillation Range	1	2	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
7.	Calorimetry of solutions	1	2	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
8.	Polarimetric analysis of specific rotation	1	2	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
9.	Analysis of refractive index	2	4	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
10.	Review	1	2	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to solve the problems provided by the teacher at the end of each unit.	b2, c5, c6, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to provide a video of simulation of one of the analytical technique studied. The students of each group must explain the simulation for other students.	c5, c6, d1, d2, d4	14	2



VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2 , a4, b1, b2, b3 b4,b7, b5, b6, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b2, c5, c6, d1, d2, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b1, b2
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2 , a4, b1, b2, b3 b4,b7, b5, b6, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2 , a4, b1, b2, b3 b4,b7, b5, b6, d2
TOTAL			60	60 %	60

Practicalpart assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, , b1, b2, b1, b2, b5, b6, c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
2	Lab. Attitude	weekly	2	2	c4, d1, d2, d3
3	Lab. Accomplishments	weekly	5	5	a4, b1, b2, b5, b6, c1, c2, c3, c4, c6, d4
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, b1, b2, b1, b2, b5, b6
6	Practical exam (practical)	14	20	20	a1, a2, , b1, b2, b1, b2, b5, b6, c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. David Harvey, modern analytical chemistry, 2000, McGraw-Hill
2. British pharmacopeia 2013

### 2- Essential References.

1. Hadkar. Instrumental methods in pharmaceutical analysis
2. Purcell. Pharmaceutical analysis

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### MEDICINAL CHEMSITRY III

<b>I. Course Identification and General Information:</b>					
1.	Course Title:	MEDICINAL CHEMSITRY III			
2.	Course Code & Number:	PHRM 09			
3.	Credit hours:	C.H			TOTAL
		Theoretical			
		L.	Tut.	S.	
		3	-	-	
			P.	Tr.	
			1	-	4
4.	Study level/ semester at which this course is offered:	<i>( THIRD ) Year – ( 2<sup>nd</sup> ) semester</i>			
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General chemistry</li> <li>Organic chemistry</li> <li>Pharmaceutical organic chemistry</li> <li>Medicinal chemistry I, II</li> </ul>			
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>Pharmacology III</li> </ul>			
7.	Program (s) in which the course is offered:	All BC programs offered by the university			
8.	Language of teaching the course:	ENGLISH			
9.	Location of teaching the course:	IN THE UNIVERSITY			
10	Prepared By:				
11	Date of Approval	<b>10/2014</b>			

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course deals with the study of synthesis, structure activity relationship (SAR), and metabolism of drugs affecting central nervous system (CNS) and chemotherapeutic drugs for infections and cancer.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	<b>A2</b>	<b>a1.</b> Explain the correlation between the chemical properties of drugs and their synthesis, identification, biological activity (SAR) and metabolism
2.		<b>a2.</b> Determine physicochemical properties, synthesis, purification, structure-activity relationship, metabolism of drugs affecting central nervous system (CNS) and chemotherapeutic drugs for infections and cancer.
3.	<b>A4</b>	<b>a3.</b> Comprehend his/her role as a pharmacist in synthesis, designing and identification of drugs.
4.	<b>B1</b>	<b>b1.</b> Differentiate between chemically related drugs.
5.		<b>b2.</b> Interpret the chemical modification applied on parent drugs to produce newer drugs.
6.		<b>b3.</b> Solve chemical problems related to identification, reactions, metabolism of drugs affecting central nervous system (CNS) and chemotherapeutic drugs for infections and cancer.
7.	<b>B2</b>	<b>b4.</b> Classify drugs affecting central nervous system (CNS) and chemotherapeutic drugs for infections and cancer chemically and therapeutically.
8.		<b>b5.</b> Compare between chemically related drugs based on their chemical structure and biological activity.
9.		<b>b6.</b> Relate biological activity of drugs to their chemical structure.
10.		<b>b7.</b> Design newer drugs from patent/parent drugs.
11.	<b>B3</b>	<b>b8.</b> Predict the outcomes of reactions, metabolism of drugs and chemical modification if occur in parent drugs..
12.	<b>B4</b>	<b>b9.</b> Assess the appropriateness of chemical modification present in newer drugs in comparison to parent drugs.
13.	<b>C1</b>	<b>c1.</b> Handle efficiently the tools and chemicals used in medicinal chemistry Lab.
14.		<b>c2.</b> Operate successfully the instruments used in medicinal chemistry Lab.
15.	<b>C2</b>	<b>c3.</b> Perform effectively the experiments, practical tasks and including drug synthesis, identification and purification of drugs using pharmacopeial procedures.

16.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.
17.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
18.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1. Share successfully in team-work.
20.	D2	d2. Show respect to life.
21.	D3	d3. Communicate effectively with his/her colleagues.
22.	D4	d4.Behave in discipline during practicing practical and professional works and assignments.
23.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

1. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
,	Lecture	Written exam , Attendance
a3	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture laboratory practice	Written exam , Attendance
		Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical

		exam)
b3	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b4, b5, b6, b7	Lecture	Written exam , Attendance, quizzes
b8	Lecture	Written exam , Attendance
b9	Lecture	Written exam , Attendance

**(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning , Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments

IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>CNS drugs</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• General anaesthetics</li> <li>• Sedatives, hypnotics and anticonvulsants.</li> <li>• Antiepileptics</li> <li>• Antipsychotics and antidepressants</li> <li>• Others</li> </ul> note : narcotic analgesics was discussed in the previous semester in " Pharmacology II" course	4	12
2	<b>Chemotherapeutic drugs bacterial infections</b> (Antibacterials)	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <b>Antibacterials</b> <ul style="list-style-type: none"> <li>• antibiotics : (<math>\beta</math>-lactams: penicillins, cephalosporins, penems, others), macrolides, aminoglycosides, tetracyclines, chloramphenicols, lincosamides, others</li> <li>• Synthetic Antibacterials : sulphonamides, fluroquinolones, nitrothiazoles (e.g. metronidazole)</li> <li>• Antituberculars and antileprotics</li> <li>• Antiseptics and disinfectants</li> </ul>	3	9
<b>mid-term exam</b>				1	2
3	<b>Chemotherapeutic drugs for fungi and viruses infections</b> (Antifungals& antivirals)	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <b>Antifungals (antimycotics)</b> <ul style="list-style-type: none"> <li>• Polyene antibiotics : nystatin, amphotericin B, griseofulvin</li> <li>• antimetabolites : flucytosine</li> </ul> azoles : clotrimazole, miconazoles, etc <b>Antivirals</b> <ul style="list-style-type: none"> <li>• anti-herpes simplex</li> <li>• anti-influenza</li> </ul>	2	6

4			<ul style="list-style-type: none"> <li>• anti-AIDS</li> <li>• immunomodulators e.g. interferone</li> </ul>		
	<b>Chemotherapeutic drugs for parasitic infections</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <b>Antiprotozoals</b> <ul style="list-style-type: none"> <li>• Antamoebics and anti giardials</li> <li>• Anti-leishmanials and anti-toxoplasmosis</li> <li>• Antimalarials</li> </ul> <b>Anthelmintics</b> <ul style="list-style-type: none"> <li>• For common worms infection</li> <li>• For tape worm : trematodes (taenia, H. nana) infections</li> <li>• For schistosoma (Bilharzia)infections</li> <li>• For filarisis</li> </ul>	1	3
5	<b>Chemotherapeutic drugs for cancer (Anticancers ; antineoplastic)</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Antimetabolites : methotrexate, 5-flurouracil. 6-mercaptopurine</li> <li>• Alkylating agents: nitrogen mustards, alkyl sulphonates, nitrosurea</li> <li>• Natural products: antibiotics, plant alkaloids, enzymes, interferons</li> <li>• Hormones and hormones anatgonists</li> <li>• Radioactive isotopes</li> <li>• Miscellaneous: cisplatin, mitotane , etc</li> </ul>	3	9
	<b>Course Review</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	Review of the course topics by discussion session.	1	3
<b>FINAL - EXAM</b>				1	3
<b>TOTAL</b>				16	47
<b>Number of Weeks /and Units Per Semester</b>				16 week s	5 Units



<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>AlignedCourse Intended Learning Outcomes CIOs</b>
1.	Pharmacopeial physicochemical properties , identification of: sedatives : diazepam	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
2.	Pharmacopeial physicochemical properties , identification: antiepileptics : carbamazepine	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
3.	Pharmacopeial physicochemical properties , identification of : antibiotic antibacterial : amoxicillin	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
4.	Pharmacopeial physicochemical properties , identification of : synthetic antibacterial : ciprofloxacin	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
5.	pharmacopeial physicochemical properties , identification of : antifungal : miconazole	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
6.	pharmacopeial physicochemical properties , identification of : antiviral : zidovudine	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
7.	pharmacopeial physicochemical properties , identification of : antiprotozoalantameobic: metronidazole	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
8.	pharmacopeial physicochemical properties , identification of : antiprotozoal antimalarial : chloroquine	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
9.	Synthesis of drugs	2	4	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
10.	Purification of drugs.	2	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.          The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with chemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b3, c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to hypothetically design newer drugs form a studied patent drug using SAR principles	b7, c5, c6, d1, d3, d5	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, , , a3,b1, b2, b3, b4, b5, b8, b9, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b3, b7, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	3	3	b3, b7
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, , , a3, b1, b2, b3,b5, b9
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, , , a3,b1, b2, b3, b4, b5, b8, b9, d2
TOTAL			60	60 %	60

Practicalpart assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d5
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d5
6	Practical exam (practical)	14	20	20	a2,b1, b3, c1, c2, c3, c4, c6, d5
Total			40	40 %	

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
<ol style="list-style-type: none"> <li>1. Gareth Thomas, Medicinal chemistry: an introduction to, 2007 John Wiley &amp; Sons Ltd,</li> <li>2. Siddique. A textbook of medicinal chemistry</li> </ol>
<b>2- Essential References.</b>
<ol style="list-style-type: none"> <li>1. AshutochKar. Medicinal chemistry, 2007, New age international publisher</li> <li>2. Rajie. Pharmaceutical chemistry</li> <li>3. Wermuth. The practice of medicinal chemistry</li> </ol>
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

**Al-RaziUniversity**  
**Medical sciences college**  
Department: pharmacy  
**Title of the Program: PHARMACY BACHELOR**

## Course Plan (Syllabus) of MEDICIANL CHEMISTRY III

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

### III. Course Description:

The course deals with the study of synthesis, structure activity relationship (SAR), and metabolism of drugs affecting central nervous system (CNS) and chemotherapeutic drugs for infections and cancer.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	<b>A2</b>	<b>a1.</b> Explain the correlation between the chemical properties of drugs and their synthesis, identification, biological activity (SAR) and metabolism
2.		<b>a2.</b> Determine physicochemical properties, synthesis, purification, structure-activity relationship, metabolism of drugs affecting central nervous system (CNS) and chemotherapeutic drugs for infections and cancer.
3.	<b>A4</b>	<b>a3.</b> Comprehend his/her role as a pharmacist in synthesis, designing and identification of drugs.
4.	<b>B1</b>	<b>b1.</b> Differentiate between chemically related drugs.
5.		<b>b2.</b> Interpret the chemical modification applied on parent drugs to produce newer drugs.
6.		<b>b3.</b> Solve chemical problems related to identification, reactions, metabolism of drugs affecting central nervous system (CNS) and chemotherapeutic drugs for infections and cancer.
7.	<b>B2</b>	<b>b4.</b> Classify drugs affecting central nervous system (CNS) and chemotherapeutic drugs for infections and cancer chemically and therapeutically.
8.		<b>b5.</b> Compare between chemically related drugs based on their chemical structure and biological activity.
9.		<b>b6.</b> Relate biological activity of drugs to their chemical structure.
10.		<b>b7.</b> Design newer drugs from patent/parent drugs.
11.	<b>B3</b>	<b>b8.</b> Predict the outcomes of reactions, metabolism of drugs and chemical modification if occur in parent drugs..
12.	<b>B4</b>	<b>b9.</b> Assess the appropriateness of chemical modification present in newer drugs in comparison to parent drugs.
13.	<b>C1</b>	<b>c1.</b> Handle efficiently the tools and chemicals used in medicinal chemistry Lab.
14.		<b>c2.</b> Operate successfully the instruments used in medicinal chemistry Lab.
15.	<b>C2</b>	<b>c3.</b> Perform effectively the experiments, practical tasks and including drug synthesis, identification and purification of drugs using pharmacopeial procedures.

16.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.
17.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
18.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1. Share successfully in team-work.
20.	D2	d2. Show respect to life.
21.	D3	d3. Communicate effectively with his/her colleagues.
22.	D4	d4.Behave in discipline during practicing practical and professional works and assignments.
23.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

2. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
,	Lecture	Written exam , Attendance
a3	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture laboratory practice	Written exam , Attendance
		Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical

		exam)
b3	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b4, b5, b6, b7	Lecture	Written exam , Attendance, quizzes
b8	Lecture	Written exam , Attendance
b9	Lecture	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning , Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments



IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>CNS drugs</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• General anaesthetics</li> <li>• Sedatives, hypnotics and anticonvulsants.</li> <li>• Antiepileptics</li> <li>• Antipsychotics and antidepressants</li> <li>• Others</li> </ul> note : narcotic analgesics was discussed in the previous semester in " Pharmacology II" course	4	12
2	<b>Chemotherapeutic drugs bacterial infections</b> (Antibacterials)	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <b>Antibacterials</b> <ul style="list-style-type: none"> <li>• antibiotics : (<math>\beta</math>-lactams: penicillins, cephalosporins, penems, others), macrolides, aminoglycosides, tetracyclines, chloramphenicols, lincosamides, others</li> <li>• Synthetic Antibacterials : sulphonamides, fluroquinolones, nitrothiazoles (e.g. metronidazole)</li> <li>• Antituberculars and antileprotics</li> <li>• Antiseptics and disinfectants</li> </ul>	3	9
<b>mid-term exam</b>				1	2
3	<b>Chemotherapeutic drugs for fungi and viruses infections</b> (Antifungals& antivirals)	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <b>Antifungals (antimycotics)</b> <ul style="list-style-type: none"> <li>• Polyene antibiotics : nystatin, amphotericin B, griseofulvin</li> <li>• antimetabolites : flucytosine</li> </ul> azoles : clotrimazole, miconazoles, etc <b>Antivirals</b> <ul style="list-style-type: none"> <li>• anti-herpes simplex</li> <li>• anti-influenza</li> </ul>	2	6

4			<ul style="list-style-type: none"> <li>• anti-AIDS</li> <li>• immunomodulators e.g. interferone</li> </ul>		
	<b>Chemotherapeutic drugs for parasitic infections</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <b>Antiprotozoals</b> <ul style="list-style-type: none"> <li>• Antamoebics and anti giardials</li> <li>• Anti-leishmanials and anti-toxoplasmosis</li> <li>• Antimalarials</li> </ul> <b>Anthelmintics</b> <ul style="list-style-type: none"> <li>• For common worms infection</li> <li>• For tape worm : trematodes (taenia, H. nana) infections</li> <li>• For schistosoma (Bilharzia)infections</li> <li>• For filarisis</li> </ul>	1	3
5	<b>Chemotherapeutic drugs for cancer (Anticancers ; antineoplastic)</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Antimetabolites : methotrexate, 5-flurouracil. 6-mercaptopurine</li> <li>• Alkylating agents: nitrogen mustards, alkyl sulphonates, nitrosurea</li> <li>• Natural products: antibiotics, plant alkaloids, enzymes, interferons</li> <li>• Hormones and hormones anatgonists</li> <li>• Radioactive isotopes</li> <li>• Miscellaneous: cisplatin, mitotane , etc</li> </ul>	3	9
	<b>Course Review</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	Review of the course topics by discussion session.	1	3
<b>FINAL - EXAM</b>				1	3
<b>TOTAL</b>				16	47
<b>Number of Weeks /and Units Per Semester</b>				16 week s	5 Units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Intended Learning Outcomes CIOs</b>
1.	Pharmacopeial physicochemical properties , identification of: sedatives : diazepam	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
2.	Pharmacopeial physicochemical properties , identification: antiepileptics : carbamazepine	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
3.	Pharmacopeial physicochemical properties , identification of : antibiotic antibacterial : amoxicillin	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
4.	Pharmacopeial physicochemical properties , identification of : synthetic antibacterial : ciprofloxacin	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
5.	pharmacopeial physicochemical properties , identification of : antifungal : miconazole	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
6.	pharmacopeial physicochemical properties , identification of : antiviral : zidovudine	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
7.	pharmacopeial physicochemical properties , identification of : antiprotozoal antameobic: metronidazole	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
8.	pharmacopeial physicochemical properties , identification of : antiprotozoal antimalarial : chloroquine	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
9.	Synthesis of drugs	2	4	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
10.	Purification of drugs.	2	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with chemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b3, c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to hypothetically design newer drugs form a studied patent drug using SAR principles	b7, c5, c6, d1, d3, d5	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, , , a3,b1, b2, b3, b4, b5, b8, b9, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b3, b7, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	3	3	b3, b7
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, , , a3, b1, b2, b3,b5, b9
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, , , a3,b1, b2, b3, b4, b5, b8, b9, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d5
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d5
6	Practical exam (practical)	14	20	20	a2,b1, b3, c1, c2, c3, c4, c6, d5
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Gareth Thomas, Medicinal chemistry: an introduction to, 2007 John Wiley & Sons Ltd,
2. Siddique. A textbook of medicinal chemistry

### 2- Essential References.

1. AshutochKar. Medicinal chemistry, 2007, New age international publisher
2. Rajie. Pharmaceutical chemistry
3. Wermuth. The practice of medicinal chemistry

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### CLINICAL PHARMACY I

I. Course Identification and General Information:						
1.	Course Title:	CLINICAL PHARMACY I				
2.	Course Code & Number:	PHRT 08				
3.	Credit hours:	C.H			TOTAL	
		Theoretical				P.
		L.	Tut.	S.		
		2	-	2		-
4.	Study level/ semester at which this course is offered:	( THIRD ) Year – ( 2 <sup>ND</sup> ) semester				
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>• Introduction to pharmacy profession</li> <li>• Pharmacology I , II</li> </ul>				
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>• Pharmacotherapy I</li> <li>• Integrated-case based learning I</li> </ul>				
7.	Program (s) in which the course is offered:	All BC programs offered by the university				
8.	Language of teaching the course:	ENGLISH				
9.	Location of teaching the course:	IN THE UNIVERSITY				
10	Prepared By:					
11	Date of Approval	10/2014				

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course is designed to provide the students with essential knowledge and skills necessary to practice clinical pharmaceutical patient-oriented services in health-care facilities. The course is complementary with pharmacotherapy and Integrated-case based learning" courses.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	<b>A3</b>	<b>a1.</b> Identify knowledge and skills required to practice clinical pharmacy in health care facilities.
2.		<b>a2.</b> Explicit the pharmaceutical care services offered by clinical pharmacists to patients in health care facilities.
3.		<b>a3.</b> Determine the non-pharmacotherapy and advices that assist in management of diseases.
4.	<b>A4</b>	<b>a4.</b> Comprehend his/her role as a pharmacist in offering clinical pharmaceutical care services to patients in health care facilities and in participation and communication with other members of the health care team.
5.	<b>B1</b>	<b>b1.</b> Express investigational data using abbreviations.
6.		<b>b2.</b> Interpret clinical features, lab. and instrumental investigations data used in diagnosis of diseases and data of patient medical records.
7.	<b>B2</b>	<b>b3.</b> Relate between investigational data and drug therapy required or applied.
8.	<b>C2</b>	<b>c1.</b> Educate patients about optimal drug use and advice how to limit risk factors
9.	<b>C4</b>	<b>c2.</b> Search efficiently for information using documented and electronic sources of information.
10.		<b>c3.</b> Present and report his/her works correctly using appropriate writing rules and technologies media.
11.	<b>D1</b>	<b>d1.</b> Share successfully in team-work.
12.	<b>D2</b>	<b>d2.</b> Show respect to life and commit to community and patients serving.
13.	<b>D3</b>	<b>d3.</b> Communicate effectively with his/her colleagues, members of health care team and patients.
14.	<b>D4</b>	<b>d4.</b> Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
15.	<b>D5</b>	<b>d5.</b> Demonstrate time management and self-learning during performing practical and professional works and assignments.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam , Attendance
a3, a4	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, feed-back learning	Written exam , Attendance, assignment, quizzes
b3	Lecture	Written exam , Attendance

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	lecture	Written exam , Attendance
c2	feed-back learning, Group-project	Assignments
c3	Feed-back learning	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	Feed-back learning	Assignments
d5	Field training	Field training assessment

IV. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to clinical pharmacy</b>	a1, a2, a4, d2	<ul style="list-style-type: none"> <li>• Definition</li> <li>• Patients-oriented services: clinical, hospital, community pharmacy; inter-relations and differences</li> <li>• Pharmacy from dispensing service to caregiving</li> <li>• Duties of clinical pharmacist</li> <li>• Clinical pharmacists as drug information center: source of information, types of drug information demanded (indications, contraindications, precautions, drug interactions, etc.)</li> <li>• basic requirements (knowledge and skills) of clinical pharmacist</li> </ul>	2	4
2	<b>Clinical pharmacist as a member of the health care team</b>	a1, a4, d2, d1, d3, d4	<ul style="list-style-type: none"> <li>○ sharing in morning rotation and discussion , cooperation with other members</li> <li>○ patient`s medical record (PMR): components, examples</li> <li>○ Skills of communication with patients</li> </ul>	2	2
	<b>Drugs therapy in specialized population</b>	a4	<ol style="list-style-type: none"> <li>1. <b>Pregnant women:</b> Harmful effects on the fetus, Recognition of teratogenic drugs, pharmacokinetics in pregnancy, drugs prescribed in pregnancy (Pregnancy A, B, C, X categories), drugs prescribed for [pain, GIT disorders, diabetes, gestational diabetes, asthma, cough, allergy, urinary tract infection, hypertension, thyroid abnormalities, thromboembolism, inflectional vaginosis, Epilepsy, mental health disorders]</li> <li>2. <b>lactating women:</b> factors influence the amount of drug an infant will receive through breast-feeding, drugs avoided during lactation, treatment</li> </ol>	2	

			of mastitis, postpartum depression, cessation of lactation)		
Mid-term exam				1	2
3	<b>Drugs therapy in specialized population</b>	a4	<p>3. <b>Pediatrics:</b> classification of pediatrics (newborn, infant, child), differences of pharmacodynamics and pharmacokinetics and admiration sites of drugs in children, drug efficacy and toxicity, factors affecting pediatric therapy, drugs prescribed for [ pain, fever, infections, GIT disorders]</p> <p>4. <b>Geriatrics:</b> relation of aging to diseases, common physiological changes in aging, alteration of pharmacokinetics and pharmacodynamics of drugs, drugs risks in elderly, drugs avoided in geriatric patients.</p>	2	4
4	<b>Non-pharmacotherapy methods</b>	a1, a2, a3, a4, c1	<ul style="list-style-type: none"> <li>• Definition, types</li> <li>• Physiotherapy : role, advantages</li> <li>• Psychotherapy : role, advantages</li> <li>• Life-style changes</li> <li>• Diet control</li> </ul>	1	2

	<b>Clinical skills of diagnosis and data interpretation</b>	a1, a4, b1, b2, b3, b5, d4	<ul style="list-style-type: none"> <li>Clinical features</li> <li>Physical (clinical) examinations: methods and interpretation</li> <li>Vital signs evaluation and interpretation</li> <li>Clinical lab. Data interpretation: blood analysis (CBC, serology, biochemistry, tumor markers), stool analysis, urine analysis.</li> <li>Clinical instrumental diagnosis: techniques and data interpretation: Radiography, ultrasonography, Computed Tomography Scan (CT scan), Magnetic Resonance Imaging, Echocardiography, electrocardiogram (ECG), Endoscopy</li> </ul>	4	8
	<b>Course Review</b>	a1, a2, a4, b1, b2, b3, , d2, d1, d3, d4, ,	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

VI. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve MCQs provided by the teacher . The questions should focus on interpretation of investigational data.	b1, b2, c2, c3, d5	4-13	6
2	<b>Group :</b> each group of students will be assigned to provide a search-based report on clinical investigations, lab. Data interpretation of specific group of patients e.g. <ul style="list-style-type: none"> <li>• AIDS patients</li> <li>• Patients in Intensive care unit ICU</li> <li>• Diabetic foot patients</li> <li>• Hemorrhoid patients</li> </ul>	b1, b2, c2, c3, d1, d3, d5	14	4

VII. Schedule of Assessment Tasks for Students During the Semester					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b1, b2, b3, , d2, d1, d3, d4, ,
2	Assignments (1 + 2)	4, 14	10	10	b1, b2, , , c2, c3, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, b1, b2, b3, , d2, d1, d3, d4, ,
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, b1, b2, b3, , d2, d1, d3, d4

TOTAL	100	100 %	100
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## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Karen J. Tietze. Clinical skills for pharmacists : A Patient-Focused Approach, 2012, Elsevier Inc.
2. James M. Ritter , A text book of clinical pharmacology and therapeutics, 2008, HodderArn

### 2- Essential References.

1. Joseph T. Diprio, Encyclopaedia of clinical pharmacy, 2003, Marcel Dekker.
2. Widmann. Good clinical interpretation of laboratory tests

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of CLINICAL PHARMACY I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department ;	SAT	SUN	MON	TUE	WED	THU
E-mail							

### II. Course Description:

The course is designed to provide the students with essential knowledge and skills necessary to practice clinical pharmaceutical patient-oriented services in health-care facilities. The course is complementary with pharmacotherapy and Integrated-case based learning" courses.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	<b>A3</b>	<b>a1.</b> Identify knowledge and skills required to practice clinical pharmacy in health care facilities.
2.		<b>a2.</b> Explicit the pharmaceutical care services offered by clinical pharmacists to patients in health care facilities.
3.		<b>a3.</b> Determine the non-pharmacotherapy and advices that assist in management of diseases.
4.	<b>A4</b>	<b>a4.</b> Comprehend his/her role as a pharmacist in offering clinical pharmaceutical care services to patients in health care facilities and in participation and communication with other members of the health care team.
5.	<b>B1</b>	<b>b1.</b> Express investigational data using abbreviations.
6.		<b>b2.</b> Interpret clinical features, lab. and instrumental investigations data used in diagnosis of diseases and data of patient medical records.
7.	<b>B2</b>	<b>b3.</b> Relate between investigational data and drug therapy required or applied.
8.	<b>C2</b>	<b>c1.</b> Educate patients about optimal drug use and advice how to limit risk factors
9.	<b>C4</b>	<b>c2.</b> Search efficiently for information using documented and electronic sources of information.
10.		<b>c3.</b> Present and report his/her works correctly using appropriate writing rules and technologies media.
11.	<b>D1</b>	<b>d1.</b> Share successfully in team-work.
12.	<b>D2</b>	<b>d2.</b> Show respect to life and commit to community and patients serving.
13.	<b>D3</b>	<b>d3.</b> Communicate effectively with his/her colleagues, members of health care team and patients.
14.	<b>D4</b>	<b>d4.</b> Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
15.	<b>D5</b>	<b>d5.</b> Demonstrate time management and self-learning during performing practical and professional works and assignments.



<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam , Attendance
a3, a4	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, feed-back learning	Written exam , Attendance, assignment, quizzes
b3	Lecture	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	lecture	Written exam , Attendance
c2	feed-back learning, Group-project	Assignments
c3	Feed-back learning	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	Feed-back learning	Assignments
d5	Field training	Field training assessment

IV. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to clinical pharmacy</b>	a1, a2, a4, d2	<ul style="list-style-type: none"> <li>• Definition</li> <li>• Patients-oriented services: clinical, hospital, community pharmacy; inter-relations and differences</li> <li>• Pharmacy from dispensing service to caregiving</li> <li>• Duties of clinical pharmacist</li> <li>• Clinical pharmacists as drug information center: source of information, types of drug information demanded (indications, contraindications, precautions, drug interactions, etc.)</li> <li>• basic requirements (knowledge and skills) of clinical pharmacist</li> </ul>	2	4
2	<b>Clinical pharmacist as a member of the health care team</b>	a1, a4, d2, d1, d3, d4	<ul style="list-style-type: none"> <li>○ sharing in morning rotation and discussion , cooperation with other members</li> <li>○ patient`s medical record (PMR): components, examples</li> <li>○ Skills of communication with patients</li> </ul>	2	2
	<b>Drugs therapy in specialized population</b>	a4	<p>2. <b>Pregnant women:</b> Harmful effects on the fetus, Recognition of teratogenic drugs, pharmacokinetics in pregnancy, drugs prescribed in pregnancy (Pregnancy A, B, C, X categories), drugs prescribed for [pain, GIT disorders, diabetes, gestational diabetes, asthma, cough, allergy, urinary tract infection, hypertension, thyroid abnormalities, thromboembolism, inflectional vaginosis, Epilepsy, mental health disorders]</p> <p>5. <b>lactating women:</b> factors influence the amount of drug an infant will</p>	2	

			receive through breast-feeding, drugs avoided during lactation, treatment of mastitis, postpartum depression, cessation of lactation)		
Mid-term exam				1	2
3	<b>Drugs therapy in specialized population</b>	a4	<p>6. <b>Pediatrics:</b> classification of pediatrics (newborn, infant, child), differences of pharmacodynamics and pharmacokinetics and admiration sites of drugs in children, drug efficacy and toxicity, factors affecting pediatric therapy, drugs prescribed for [ pain, fever, infections, GIT disorders]</p> <p>7. <b>Geriatrics:</b> relation of aging to diseases, common physiological changes in aging, alteration of pharmacokinetics and pharmacodynamics of drugs, drugs risks in elderly, drugs avoided in geriatric patients.</p>	2	4
4	<b>Non-pharmacotherapy methods</b>	a1, a2, a3, a4, c1	<ul style="list-style-type: none"> <li>• Definition, types</li> <li>• Physiotherapy : role, advantages</li> <li>• Psychotherapy : role, advantages</li> <li>• Life-style changes</li> <li>• Diet control</li> </ul>	1	2

	<b>Clinical skills of diagnosis and data interpretation</b>	a1, a4, b1, b2, b3, b5, d4	<ul style="list-style-type: none"> <li>Clinical features</li> <li>Physical (clinical) examinations: methods and interpretation</li> <li>Vital signs evaluation and interpretation</li> <li>Clinical lab. Data interpretation: blood analysis (CBC, serology, biochemistry, tumor markers), stool analysis, urine analysis.</li> <li>Clinical instrumental diagnosis: techniques and data interpretation: Radiography, ultrasonography, Computed Tomography Scan (CT scan), Magnetic Resonance Imaging, Echocardiography, electrocardiogram (ECG), Endoscopy</li> </ul>	4	8
	<b>Course Review</b>	a1, a2, a4, b1, b2, b3, , d2, d1, d3, d4, ,	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

VI. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve MCQs provided by the teacher . The questions should focus on interpretation of investigational data.	b1, b2, c2, c3, d5	4-13	6
2	<b>Group :</b> each group of students will be assigned to provide a search-based report on clinical investigations, lab. Data interpretation of specific group of patients e.g. <ul style="list-style-type: none"> <li>• AIDS patients</li> <li>• Patients in Intensive care unit ICU</li> <li>• Diabetic foot patients</li> <li>• Hemorrhoid patients</li> </ul>	b1, b2, c2, c3, d1, d3, d5	14	4

VII. Schedule of Assessment Tasks for Students During the Semester					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b1, b2, b3, d2, d1, d3, d4
2	Assignments (1 + 2)	4, 14	10	10	b1, b2, c2, c3, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, b1, b2, b3, d2, d1, d3, d4
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, b1, b2, b3, , d2, d1, d3, d4
TOTAL			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
<ol style="list-style-type: none"> <li>1. Karen J. Tietze. Clinical skills for pharmacists : A Patient-Focused Approach, 2012, Elsevier Inc.</li> <li>2. James M. Ritter , A text book of clinical pharmacology and therapeutics, 2008, HodderArn</li> </ol>
<b>2- Essential References.</b>
<ol style="list-style-type: none"> <li>1. Joseph T. Diprio, Encyclopaedia of clinical pharmacy, 2003, Marcel Dekker.</li> <li>2. Widmann. Good clinical interpretation of laboratory tests</li> </ol>
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### CLINICAL PHARMACY II

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	CLINICAL PHARMACY I					
2.	Course Code & Number:	PHRT 11					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	2	-		-
4.	Study level/ semester at which this course is offered:	( FOURT ) Year – ( 1 <sup>ST</sup> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>Introduction to pharmacy profession</li> <li>Pharmacology I , II&amp; III</li> <li>Pharmacotherapy I</li> <li>Clinical pharmacy I</li> </ul>					
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>Pharmacotherapy II</li> <li>Integrated-case based learning II</li> </ul>					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course is designed to provide the students with essential knowledge and skills necessary to practice clinical pharmaceutical services to in-patients. The course is complementary with pharmacotherapy and Integrated-case based learning" courses.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	<b>A3</b>	<b>a1.</b> Identify knowledge and skills required to practice clinical pharmacy in health care facilities.
2.		<b>a2.</b> Explicit the pharmaceutical care services offered by clinical pharmacists to patients in health care facilities.
3.	<b>A4</b>	<b>a3.</b> Comprehend his/her role as a pharmacist in offering clinical pharmaceutical care services to patients in health care facilities and to practice clinical trials.
4.	<b>B1</b>	<b>b1.</b> Express investigational data using abbreviations.
5.		<b>b2.</b> Interpret clinical features, lab. and instrumental investigations data used in diagnosis of diseases and data of patient medical records.
6.	<b>B3</b>	<b>b3.</b> Relate between investigational data and drug therapy required or applied
7.		<b>b4.</b> Design a therapeutic regimen (plan) for treatment of diseases based on standard protocols and patient case in particular for specific group of patients including pediatrics, geriatrics, pregnant and lactating women.
8.	<b>B4</b>	<b>b5 .</b> Assess the drug therapy regimen applied to patients.
9.		<b>b6.</b> Select alternative drugs to solve drug therapy failure.
10.	<b>C2</b>	<b>c1.</b> Monitor drug therapy applied to inpatients.
11.		<b>c2.</b> Determine the reason of drug therapy failure.
12.		<b>c3.</b> Educate patients about optimal drug use and advice how to limit risk factors and avoid adverse effects related to pharmaceuticals.
13.	<b>C4</b>	<b>c4 .</b> Search efficiently for information using documented and electronic sources of information.
14.		<b>c5.</b> Present and report his/her works correctly using appropriate writing rules and technologies media.
15.	<b>D1</b>	<b>d1.</b> Share successfully in team-work.
16.	<b>D2</b>	<b>d2.</b> Show respect to life and commit to community and patients serving.
17.	<b>D3</b>	<b>d3.</b> Communicate effectively with his/her colleagues, members of health care team and patients.
18.	<b>D4</b>	<b>d4.</b> Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.



19.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.
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2. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam , Attendance
a3	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, feed-back learning	Written exam , Attendance, assignment
b3	Lecture	Written exam , Attendance
b4	Lecture, feed-back learning	Written exam , Attendance, assignment
b5, b6	Lecture, feed-back learning	Written exam , Attendance, quizzes
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 , c2	lecture, feed-back learning	Written exam , Attendance, assignment
c3	lecture	Written exam , Attendance
c4	feed-back learning, Group-project	Assignments
c5	Feed-back learning	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	Feed-back learning	Assignments
d5	Field training	Field training assessment

IV. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	skills of Assessment of drug therapy(drug therapy monitoring DTM)	a1, a2, a3, b1, b2, b3, b5, b6, c1, c2, c3, d2	<ul style="list-style-type: none"> <li>Objectives</li> <li>patients need DTM</li> <li>methods</li> <li>steps of DTM</li> <li>How to study case of DTM ?</li> <li>Examples of solved case studies</li> <li>determination the source of the drug therapy problem</li> </ul>	4	8
2	skills of Designing a therapeutic regimen for a patient	a1, a2, a3, b1, b2, b3, b4, b6, c3, d2	<ul style="list-style-type: none"> <li>data and Information of th case required</li> <li>selection of drugs,</li> </ul>	2	4
<ul style="list-style-type: none"> <li>mid-term exam</li> </ul>				1	2
3	skills of Designing a therapeutic regimen for a patient	a1, a2, a3, b1, b2, b3, b4, b6, c3, d2	<ul style="list-style-type: none"> <li>How to study case of therapeutic regimen ?</li> <li>Examples of solved case studies</li> </ul>	2	4
4	Role of clinical pharmacist in clinical trails	a3	<ul style="list-style-type: none"> <li>mission of clinical pharmacist in clinical trails</li> <li>types of clinical trials</li> <li>clinical trial protocol</li> <li><input type="checkbox"/> clinical trial ethics</li> </ul>	3	6
5	Clinical pharmaceuticals: clinical adverse effects related to pharmaceuticals	c3	Reasons, causes and avoidance of : <ul style="list-style-type: none"> <li>Adhesion and trapping of tablets to esophagus</li> <li>o Reaction to impurities: impurities of Heparin, penicillin's</li> </ul>	2	4
Course Review		a1, a2, a3, b1, b2, b3, b5, d2, d1, d3, d4, c1, c2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2

TOTAL	16	32
Number of Weeks /and Units Per Semester	16 weeks	5 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

VI. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<p><b>Individual:</b> every student is assigned to solve MCQs provided by the teacher . The questions should focus on interpretation of investigational data, monitoring of drug therapy, designing a therapeutic plan , determination source of drug therapy failure, drug selection</p>	b1, b2, c4, c5, d5	4-13	6
2	<p><b>Group :</b> each group of students will be assigned to provide a search-based report on drug selection and therapy monitoring and non-pharmacotherapy of specific group of patients e.g.</p> <ul style="list-style-type: none"> <li>• Ovarian cancer</li> <li>• Patients in Intensive care unit ICU</li> <li>• Dingo fever</li> <li>• Malaria</li> </ul>	b1, b2, c1, c2, c4, c5, d1, d3, d5	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, , a3, b1, b2, b3, b5, d2, d1, d3, d4, c1, c2
2	Assignments (1 + 2)	4, 14	10	10	b1, b2, c1, c2, c4, c5, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b5, b6
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, , a3, b1, b2, b3, b5, d2, d1, d3, d4, c1, c2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, , a3, b1, b2, b3, b5, d2, d1, d3, d4, c1, c2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( minimum two ).

1. Karen J. Tietze. Clinical skills for pharmacists : A Patient-Focused Approach, 2012, Elsevier Inc.
2. James M. Ritter , A text book of clinical pharmacology and therapeutics, 2008, HodderArn

### 2- Essential References.

1. Joseph T. Diprio, Encyclopaedia of clinical pharmacy, 2003, Marcel Dekker.
2. Widmann. Good clinical interpretation of laboratory tests

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

### IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of CLINICAL PHARMACY II

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department;	SAT	SUN	MON	TUE	WED	THU
E-mail							

III. Course Description:
<p>The course is designed to provide the students with essential knowledge and skills necessary to practice clinical pharmaceutical services to in-patients. The course is complementary with pharmacotherapy and Integrated-case based learning" courses.</p>

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>3. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
20.	<b>A3</b>	<b>a1.</b> Identify knowledge and skills required to practice clinical pharmacy in health care facilities.
21.		<b>a2.</b> Explicit the pharmaceutical care services offered by clinical pharmacists to patients in health care facilities.
22.	<b>A4</b>	<b>a3.</b> Comprehend his/her role as a pharmacist in offering clinical pharmaceutical care services to patients in health care facilities and to practice clinical trials.
23.	<b>B1</b>	<b>b1.</b> Express investigational data using abbreviations.
24.		<b>b2.</b> Interpret clinical features, lab. and instrumental investigations data used in diagnosis of diseases and data of patient medical records.
25.	<b>B3</b>	<b>b3.</b> Relate between investigational data and drug therapy required or applied
26.		<b>b4.</b> Design a therapeutic regimen (plan) for treatment of diseases based on standard protocols and patient case in particular for specific group of patients including pediatrics, geriatrics, pregnant and lactating women.
27.	<b>B4</b>	<b>b5 .</b> Assess the drug therapy regimen applied to patients.
28.		<b>b6.</b> Select alternative drugs to solve drug therapy failure.
29.	<b>C2</b>	<b>c1.</b> Monitor drug therapy applied to in-patients.
30.		<b>c2.</b> Determine the reason of drug therapy failure.
31.		<b>c3.</b> Educate patients about optimal drug use and advice how to limit risk factors and avoid adverse effects related to pharmaceuticals.
32.	<b>C4</b>	<b>c4 .</b> Search efficiently for information using documented and electronic sources of information.
33.		<b>c5.</b> Present and report his/her works correctly using appropriate writing rules and technologies media.
34.	<b>D1</b>	<b>d1.</b> Share successfully in team-work.
35.	<b>D2</b>	<b>d2.</b> Show respect to life and commit to community and patients serving.
36.	<b>D3</b>	<b>d3.</b> Communicate effectively with his/her colleagues, members of health care team and patients.
37.	<b>D4</b>	<b>d4.</b> Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.



38.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.
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4. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam , Attendance
a3	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, feed-back learning	Written exam , Attendance, assignment
b3	Lecture	Written exam , Attendance
b4	Lecture, feed-back learning	Written exam , Attendance, assignment
b5, b6	Lecture, feed-back learning	Written exam , Attendance, quizzes
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 , c2	lecture, feed-back learning	Written exam , Attendance, assignment
c3	lecture	Written exam , Attendance
c4	feed-back learning, Group-project	Assignments
c5	Feed-back learning	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	Feed-back learning	Assignments
d5	Field training	Field training assessment

<b>V. Course Content:</b>					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>skills of Assessment of drug therapy(drug therapy monitoring DTM)</b>	a1, a2, a3, b1, b2, b3, b5, b6, c1, c2, c3, d2	<ul style="list-style-type: none"> <li>Objectives</li> <li>patients need DTM</li> <li>methods</li> <li>steps of DTM</li> <li>How to study case of DTM ?</li> <li>Examples of solved case studies</li> <li>determination the source of the drug therapy problem</li> </ul>	4	8
2	<b>skills of Designing a therapeutic regimen for a patient</b>	a1, a2, a3, b1, b2, b3, b4, b6, c3, d2	<ul style="list-style-type: none"> <li>data and Information of the case required</li> <li>selection of drugs,</li> </ul>	2	4
mid-term exam				1	2
3	<b>skills of Designing a therapeutic regimen for a patient</b>	a1, a2, a3, b1, b2, b3, b4, b6, c3, d2	<ul style="list-style-type: none"> <li>How to study case of therapeutic regimen ?</li> <li>Examples of solved case studies</li> </ul>	2	4
4	<b>Role of clinical pharmacist in clinical trails</b>	a3	<ul style="list-style-type: none"> <li>mission of clinical pharmacist in clinical trails</li> <li>types of clinical trials</li> <li>clinical trial protocol</li> <li><input type="checkbox"/> clinical trial ethics</li> </ul>	3	6
5	<b>Clinical pharmaceuticals: clinical adverse effects related to pharmaceuticals</b>	c3	<b>Reasons, avoidance &amp; examples of :</b> <ul style="list-style-type: none"> <li>Adhesion and trapping of tablets to esophagus</li> <li>o Reaction to impurities: impurities of Heparin, penicillin's</li> </ul>	2	4
<b>Course Review</b>		a1, a2, a3, b1, b2, b3, b5, d2, d1, d3, d4, c1, c2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2

TOTAL	16	32
Number of Weeks /and Units Per Semester	16 weeks	5 Units

## VI. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student`s brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

VII. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<p><b>Individual:</b> every student is assigned to solve MCQs provided by the teacher . The questions should focus on interpretation of investigational data, monitoring of drug therapy, designing a therapeutic plan , determination source of drug therapy failure, drug selection</p>	b1, b2, c4, c5, d5	4-13	6
2	<p><b>Group :</b> each group of students will be assigned to provide a search-based report on drug selection and therapy monitoring and non-pharmacotherapy of specific group of patients e.g.</p> <ul style="list-style-type: none"> <li>• Ovarian cancer</li> <li>• Patients in Intensive care unit ICU</li> <li>• Dingo fever</li> <li>• Malaria</li> </ul>	b1, b2, c1, c2, c4, c5, d1, d3, d5	14	4

### VIII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, , a3, b1, b2, b3, b5, d2, d1, d3, d4, c1, c2
2	Assignments (1 + 2)	4, 14	10	10	b1, b2, c1, c2, c4, c5, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b5, b6
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, , a3, b1, b2, b3, b5, d2, d1, d3, d4, c1, c2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, , a3, b1, b2, b3, b5, d2, d1, d3, d4, c1, c2
TOTAL			100	100 %	100

### IX. Learning Resources:

#### 1- Required Textbook(s) ( minimum two ).

1. Karen J. Tietze. Clinical skills for pharmacists : A Patient-Focused Approach, 2012, Elsevier Inc.
2. James M. Ritter , A text book of clinical pharmacology and therapeutics, 2008, HodderArn

#### 2- Essential References.

3. Joseph T. Diprio, Encyclopaedia of clinical pharmacy, 2003, Marcel Dekker.
4. Widmann. Good clinical interpretation of laboratory tests

#### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

<b>X. Course Policies:</b>	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### BIOPHARMACEUTICS

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	BIPHARMACEUTICS					
2.	Course Code & Number:	PHRT 11					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( <i>FOURTH</i> ) Year – ( <i>1<sup>ST</sup></i> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>Pharmaceutics I , II, III</li> <li>Pharmacology I, II, III</li> </ul>					
6.	Co –requisite (if any):	NONE					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study the interrelationship of the physicochemical properties of the drug, the dosage form, the biological factors with the rate and extent of drug availability at the site of action and accordingly its therapeutic efficacy. The course also provides the students with essential knowledge of biopharmaceutical studies.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Provide clinically-based examples of drugs whose bioavailability were affected by various factors.
2.		a2. Explain the biological steps of drugs bioavailability and the laws/equations governing them.
3.		a3. Determine the physicochemical , biological and pharmaceutical factors that affect drug bioavailability.
4.		a4. Recognize the role of excipients and the type of dosage forms in drug bioavailability.
5.	A3	a5. Define biopharmaceutics , bioavailability and bioequivalence.
6.		a6. Explicit the biopharmaceutical classification system (BCS) of drugs.
7.	A4	a7. Comprehend his/her role as a pharmacist in assessment and improvement of drug bioavailability and hence drugs therapeutic efficacy.
8.	B1	b1. Express drug bioavailability using rate and extent expression.
9.		b2. Interpret figures and graphs of biopharmaceutical studies.
10.	B2	b3 . Classify drugs biopharmaceutically.
11.		b4. Compare between various biological steps involved in drug bioavailability.
12.		b5. Relate between in vitro and in vivo biopharmaceutical data.
13.	B4	b6 . Assess drug bioavailability based on in vivo or in vitro data
14.		b7. Select the most appropriate approach to test the bioavailability and its various step.
15.	C2	c1. Apply biopharmaceutics knowledge to recommend patients /physicians of the best approaches of enhancing drug bioavailability.
16.		c2. Choose the best drug/formulation based on their bioavailability studies data.
17.	C4	c3 .Search efficiently for information using documented and electronic sources of information.
18.		c4. Present and report his/her workcorrectly using appropriate writing rules and technologies media.
19.	D1	d1. Share successfully in team-work.



20.	D2	d2. Show respect to life and commit to community and patients serving.
21.	D3	d3. Communicate effectively with his/her colleagues, members of health care team, patients and community
22.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
23.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

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<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, , a2, a3	Lecture, feed-back leaning	Written exam , Attendance, assignment
a5, a6	Lecture	Written exam , Attendance
a7	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, feed-back learning	Written exam , Attendance, assignments
b3, b4, b5	Lecture	Written exam , Attendance
b6, b7	Lecture	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 , c2	Lecture, feed-back leaning	Written exam , Attendance , assignments, quizzes
c3, c4	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies

d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	Feed-back learning	Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to biopharmaceutics</b>	a2, a3, a5, a7, b1, b2,c1, d2	<input type="checkbox"/> Definition and significance of biopharmaceutics and bioavailability. <input type="checkbox"/> relation of biopharmaceutics to other pharmaceutical sciences <input type="checkbox"/> correlation between bioavailability & drug efficacy <input type="checkbox"/> Expressions of drug bioavailability <input type="checkbox"/> factors affecting bioavailability <input type="checkbox"/> Introduction to steps for drug bioavailability	1	2
2	<b>Bioavailability steps</b>	a1, a2, a7, b1, b2, b4, b6, b7, c1, d2	<b>Drug Release</b> Definition, significance , Expression parameters (cumulative % release, drug release rate) <input type="checkbox"/> Mechanisms and governing equations : Fick`s law, Higuchi equation, Peppas equation (matrix diffusion, membrane diffusion, Fickian, Non-Fickian, controlled) <b>Drug dissolution</b> <input type="checkbox"/> Definition, significance , Expression parameters (cumulative % dissolved, dissolution rate), Mechanisms and governing equations : Noyes-Whitney equation	1	2
		a1, a2, a7, b1, b2, b4, b6, b7, c1, d2	<b>Drug absorption</b> <input type="checkbox"/> Definition, significance <input type="checkbox"/> Expression parameters (cumulative % absorbed, absorption rate, absorption rate constant) <input type="checkbox"/> Mechanisms and governing equations , properties and examples of drugs absorbed by each mechanism. Passive	2	4

			<p>diffusion (transcellular) : Fick`s law.</p> <ul style="list-style-type: none"> <li>o Carrier-mediated : Active transport, facilitated diffusion,</li> <li>o Convective (paracellular) transport, ion-pair transport, endocytosis</li> </ul>		
		a1, a2, a7, b1, b2, b4, b6, b7, c1, d2	<p><b>metabolism (biotransformation)</b>          Definition, significance of , Expression parameters: volume of distribution and related equations (related to blood flow, dose and plasma concentration, Mechanisms (passive diffusion, active transport), steps and sites of distribution</p> <ul style="list-style-type: none"> <li>□ Definition, significance of drug biotransformation, Outcomes (products: active, inactive metabolite) with examples of drugs</li> <li>□ Sites of metabolism: resystemic (first-pass effect), hepatic with examples of drugs highly influenced by presystemic metabolism.</li> <li>□ Mechanisms (phases Reaction): phase I and phase II: types of reactions, examples of drugs , Affecting factors : Biological Factors , pharmaceutical factors and Exogenous factors</li> </ul> <p><b>drug excretion</b></p> <ul style="list-style-type: none"> <li>□ Definition, significance</li> <li>□ Renal excretion : the nephron anatomy</li> <li>□ Properties of drugs excreted by the kidneys, Mechanisms: glomerular filtration, active tubular secretion, Tubular reabsorption, Factors affecting each excretion mechanism: biological, pharmaceutical and exogenous factors</li> <li>□ Excretion from the liver and other organs and the enterhepatic circulation</li> </ul>	2	4
mid-term exam				1	2
3	<b>Biological factors affecting drug bioavailability</b>	a1, a3, a7, b1, b2, c1, d2	<ul style="list-style-type: none"> <li>• biological factors affecting drug absorption" anatomy and physiology of absorption site of different routes of administration</li> <li>• biological factors affecting drug distribution" plasma protein</li> </ul>	3	

			<ul style="list-style-type: none"> <li>binding, others</li> <li>biological factors affecting drug metabolism "</li> <li>biological factors affecting drug excretion</li> <li>Pathological factors affecting bioavailability</li> <li>genetic factors affecting bioavailability</li> </ul>		
4	<b>Pharmaceutical factors affecting drug bioavailability</b>	a1, a3, a4, a7, b1, b2, c1, c2, d2	<ul style="list-style-type: none"> <li>factors affecting related to drug physicochemical properties</li> <li>factors related to excipients</li> <li>factors related to formulation (dosage forms)</li> <li>factors related to manufacturing method.</li> </ul>	2	
5	<b>Biopharmaceutical studies</b>	a1, a2, a3, a6, a7, b1, b2, b3, b5, b6, b7, c1, c2, d2	<ul style="list-style-type: none"> <li>Biopharmaceutical classification scheme</li> <li>In vivo studies: Pharmacokinetic and pharmacodynamics Bioavailability study ( For a new drug): absolute bioavailability, definition, equation,</li> <li>Bioequivalence study : relative bioavailability, definition, equation</li> <li>□ In vitro studies : Drug release and dissolution studies (in fasted and feed state) in fluid simulant to that the g.i.t fluid, In vitro Stability of drug in fluid simulant to those of g.i.t, Permeability studies (partition coefficient determination, Ex vivo permeation studies</li> <li>□ IVIVC : in vivo in vitro correlation studies</li> </ul>	2	
	<b>Course Review</b>	a1, a2, a3, a4, a5, a6, a7, b1, b2, b3, b4, b5, b6, b7, c1, c2, d2	Review of the course topics by discussion session.	1	2

FINAL - EXAM	1	2
TOTAL	16	32
Number of Weeks /and Units Per Semester	16 weeks	Units

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a summary of one of the studied topics.	c3, c4, d5	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report of three biopharmaceutical studies concerning one factor affecting in bioavailability.	c3, c4, d1, d3, d5	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, a6, a7, b1, b2, b3, b4, b5, b6, b7, c1, c2, d2
2	Assignments (1 + 2)	4, 14	10	10	c3, c4, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, c1
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a7, b1, b2, b4, b6, b7, c1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a5, a6, a7, b1, b2, b3, b4, b5, b6, b7, c1, c2, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Shargel. Biopharmaceutics and pharmacokinetics, 2002, McGraw Hill Inc.

### 2- Essential References.

1. Gibaldi. Biopharmaceutics and clinical pharmacokinetics
2. Harle. Pharmacokinetics and biopharmaceutics

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1. **Class Attendance:** At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam

2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of BIOPHARMACEUTICS

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

### II. Course Description:

The course deals with the study the interrelationship of the physicochemical properties of the drug, the dosage form, the biological factors with the rate and extent of drug availability at the site of action and accordingly its therapeutic efficacy. The course also provides the students with essential knowledge of biopharmaceutical studies.



<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A2	a1. Provide clinically-based examples of drugs whose bioavailability were affected by various factors.
2.		a2. Explain the biological steps of drugs bioavailability and the laws/equations governing them.
3.		a3. Determine the physicochemical , biological and pharmaceutical factors that affect drug bioavailability.
4.		a4. Recognize the role of excipients and the type of dosage forms in drug bioavailability.
5.	A3	a5. Define biopharmaceutics , bioavailability and bioequivalence.
6.		a6. Explicit the biopharmaceutical classification system (BCS) of drugs.
7.	A4	a7. Comprehend his/her role as a pharmacist in assessment and improvement of drug bioavailability and hence drugs therapeutic efficacy.
8.	B1	b1. Express drug bioavailability using rate and extent expression.
9.		b2. Interpret figures and graphs of biopharmaceutical studies.
10.	B2	b3 . Classify drugs biopharmaceutically.
11.		b4. Compare between various biological steps involved in drug bioavailability.
12.		b5. Relate between in vitro and in vivo biopharmaceutical data.
13.	B4	b6 . Assess drug bioavailability based on in vivo or in vitro data
14.		b7. Select the most appropriate approach to test the bioavailability and its various step.
15.	C2	c1. Apply biopharmaceutics knowledge to recommend patients /physicians of the best approaches of enhancing drug bioavailability.
16.		c2. Choose the best drug/formulation based on their bioavailability studies data.
17.	C4	c3 .Search efficiently for information using documented and electronic sources of information.
18.		c4. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1. Share successfully in team-work.

20.	D2	d2. Show respect to life and commit to community and patients serving.
21.	D3	d3. Communicate effectively with his/her colleagues, members of health care team, patients and community
22.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
23.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture, feed-back leaning	Written exam, Attendance, assignment
a5, a6	Lecture	Written exam, Attendance
a7	Lecture	Written exam, Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, feed-back learning	Written exam, Attendance, assignments
b3, b4, b5	Lecture	Written exam, Attendance
b6, b7	Lecture	Written exam, Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lecture, feed-back leaning	Written exam, Attendance, assignments, quizzes
c3, c4	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments

d2	Lecture	Written exam , Attendance
d5	Feed-back learning	Assignments

#### IV. Course Content:

O rd	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
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er					
1	<b>Introduction to biopharmaceutics</b>	a2, a3, a5, a7, b1, b2,c1, d2	<input type="checkbox"/> Definition and significance of biopharmaceutics and bioavailability. <input type="checkbox"/> relation of biopharmaceutics to other pharmaceutical sciences <input type="checkbox"/> correlation between bioavailability & dug efficacy <input type="checkbox"/> Expressions of drug bioavailability <input type="checkbox"/> factors affecting bioavailability <input type="checkbox"/> Introduction to steps for drug bioavailability	1	2
2	<b>Bioavailability steps</b>	a1, a2, a7, b1, b2, b4, b6, b7, c1, d2	<b>Drug Release</b> Definition, significance , Expression parameters (cumulative % release, drug release rate) <input type="checkbox"/> Mechanisms and governing equations : Fick`s law, Higuchi equation, Peppas equation (matrix diffusion, membrane diffusion, Fickian, Non-Fickian, controlled) <b>Drug dissolution</b> <input type="checkbox"/> Definition, significance , Expression parameters (cumulative % dissolved, dissolution rate), Mechanisms and governing equations : Noyes-Whitney equation	1	2
		a1, a2, a7, b1, b2, b4, b6, b7, c1, d2	<b>Drug absorption</b> <input type="checkbox"/> Definition, significance <input type="checkbox"/> Expression parameters (cumulative % absorbed, absorption rate, absorption rate constant) <input type="checkbox"/> Mechanisms and governing equations , properties and examples of drugs absorbed by each mechanism. Passive diffusion (transcellular) : Fick`s law. o Carrier-mediated : Active transport, facilitated diffusion, o Convective (paracellular) transport, ion-pair transport, endocytosis	2	4

		a1, a2, a7, b1, b2, b4, b6, b7, c1, d2	<p><b>metabolism (biotransformation)</b>          Definition, significance of , Expression parameters: volume of distribution and related equations (related to blood flow, dose and plasma concentration, Mechanisms (passive diffusion, active transport), steps and sites of distribution  <input type="checkbox"/> Definition, significance of drug biotransformation, Outcomes (products: active, inactive metabolite) with examples of drugs  <input type="checkbox"/> Sites of metabolism: resystemic (first-pass effect), hepatic with examples of drugs highly influenced by presystemic metabolism.  <input type="checkbox"/> Mechanisms (phases Reaction): phase I and phase II: types of reactions, examples of drugs , Affecting factors : Biological Factors , pharmaceutical factors and Exogenous factors</p> <p><b>drug excretion</b>  <input type="checkbox"/> Definition, significance  <input type="checkbox"/> Renal excretion : the nephron anatomy  <input type="checkbox"/> Properties of drugs excreted by the kidneys, Mechanisms: glomerular filtration, active tubular secretion, Tubular reabsorption, Factors affecting each excretion mechanism: biological, pharmaceutical and exogenous factors  <input type="checkbox"/> Excretion from the liver and other organs and the enterhepatic circulation</p>	2	4
mid-term exam				1	2
3	<b>Biological factors affecting drug bioavailability</b>	a1, a3, a7, b1, b2, c1, d2	<ul style="list-style-type: none"> <li>• biological factors affecting drug absorption" anatomy and physiology of absorption site of different routes of administration</li> <li>• biological factors affecting drug distribution" plasma protein binding, others</li> <li>• biological factors affecting drug metabolism "</li> <li>• biological factors affecting drug excretion</li> </ul>	3	

			<ul style="list-style-type: none"> <li>• Pathological factors affecting bioavailability</li> <li>• genetic factors affecting bioavailability</li> </ul>		
4	<b>Pharmaceutical factors affecting drug bioavailability</b>	a1, a3, a4, a7, b1, b2, c1, c2, d2	<ul style="list-style-type: none"> <li>• factors affecting related to drug physicochemical properties</li> <li>• factors related to excipients</li> <li>• factors related to formulation (dosage forms)</li> <li>• factors related to manufacturing method.</li> </ul>	2	
5	<b>Biopharmaceutical studies</b>	a1, a2, a3, a6, a7, b1, b2, b3, b5, b6, b7, c1, c2, d2	<ul style="list-style-type: none"> <li>• Biopharmaceutical classification scheme</li> <li>• In vivo studies: Pharmacokinetic and pharmacodynamics Bioavailability study ( For a new drug): absolute bioavailability, definition, equation,</li> <li>• Bioequivalence study : relative bioavailability, definition, equation</li> <li>• <input type="checkbox"/> In vitro studies : Drug release and dissolution studies (in fasted and feed state) in fluid simulant to that the g.i.t fluid, In vitro Stability of drug in fluid simulant to those of g.i.t, Permeability studies (partition coefficient determination, Ex vivo permeation studies</li> <li>• <input type="checkbox"/> IVIVC : in vivo in vitro correlation studies</li> </ul>	2	
	<b>Course Review</b>	a1, a2, a3, a4, a5, a6, a7, b1, b2, b3, b4, b5, b6, b7, c1, c2, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2

TOTAL	16	32
Number of Weeks /and Units Per Semester	16 weeks	Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a summary of one of the studied topics.	c3, c4, d5	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report of three biopharmaceutical studies concerning one factor affecting in bioavailability.	c3, c4, d1, d3, d5	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, a6, a7, b1, b2, b3, b4, b5, b6, b7, c1, c2, d2
2	Assignments (1 + 2)	4, 14	10	10	c3, c4, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, c1
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a7, b1, b2, b4, b6, b7, c1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a5, a6, a7, b1, b2, b3, b4, b5, b6, b7, c1, c2, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Shargel. Biopharmaceutics and pharmacokinetics, 2002, McGraw Hill Inc.

### 2- Essential References.

3. Gibaldi. Biopharmaceutics and clinical pharmacokinetics
4. Harle. Pharmacokinetics and biopharmaceutics

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1. **Class Attendance:** At least 75 % of the course hours should be attended by the student.



	Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

Medical sciences college  
 Department: Pharmacy  
 Title of the Program: PHARMACY BACHELOR

## Course Specification

### INTEGRATED CASE-BASED LEARNING II

<b>I. Course Identification and General Information:</b>					
1.	Course Title:	INTEGRATED CASE-BASED LEARNING II			
2.	Course Code & Number:	PHRT 14			
3.	Credit hours:	C.H			TOTAL
		Theoretical			
		L.	Tut.	S.	
		-	-	2	
		P.	Tr.		
		-	-	2	
4.	Study level/ semester at which this course is offered:	( <i>FOURTH</i> ) Year – ( <i>1<sup>ST</sup></i> ) semester			
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>• Physiology I &amp; II</li> <li>• Pathology</li> <li>• Pathophysiology</li> <li>• Pharmacology I , II &amp; III</li> <li>• Integrated case-based learning I</li> </ul>			
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>• Clinical pharmacy II</li> <li>• Pharmacotherapy II</li> </ul>			
7.	Program (s) in which the course is offered:	All BC programs offered by the university			
8.	Language of teaching the course:	ENGLISH			
9.	Location of teaching the course:	IN THE UNIVERSITY			
10	Prepared By:				
11	Date of Approval	<b>10/2014</b>			

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course is designed to augment the course of clinical pharmacy (II) and pharmacotherapy (II) by seminar discussion of selected clinical cases.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A4	a1. Comprehend his/her role as a pharmacist in studying patient cases and solving case problems.
2.	B1	b1. Interpret clinical and investigational data.
3.	B1	b2. Solve patient-case problems including defining therapeutic goals, designing a therapeutic regimen, monitoring of drug therapy.
4.	B2	b3. Relate between patient case data and drug selection.
5.	B1	b4. Design a therapeutic regimen to patient case.
6.	B1	b5. Predict the outcomes of selected therapy.
7.	B2	b6. Select the appropriate drugs for each patient-case.
8.	C2	c1. Apply knowledge of pharmacology, pharmacotherapy and clinical pharmacy in studying patient cases.
9.	C2	c2. Provide appropriate and effective recommendation to the health care team on drug selection.
10.	C3	c3. Provide effective advices to patients to limit risk factors and to control his/her life style and diet in order to assist drug therapy.
11.	C1	c4. Present and report his/her work correctly using appropriate writing rules and technologies media.
12.	D1	d1. Share successfully in team-work.
13.	D2	d2. Show respect to life and commit to community and patients serving.
14.	D3	d3. Communicate effectively with his/her colleagues
15.	D5	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>a1</b>	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>b1</b>	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
<b>b2</b>	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
<b>b3</b>	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
<b>b4, b5</b>	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
<b>b6</b>	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>c1 , c2, c3</b>	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
<b>c4</b>	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
d2	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
d4	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)

## IV. Course Content:

### Seminar Discussion , Presentation and Group system

- The students shall be divided into groups so as to comprehend all cases
- Each group will be assigned to study a given clinical case prepared by the teacher including several questions about the case.
- The group should study the case and answer the associated questions, and then make a seminar presentation in front of the teacher and the other students.
- The presentation should include:
  - Patient's data
  - Clinical features and interpretation
  - Lab. and instrumental investigational data and interpretation
  - Assessment of drug therapy: suitability of drugs to the patient's case, the source of drug therapy problem (if any), the need to change the therapy (if necessary).
- The teacher will prepare further questions about the case

Order	Units/ Topics List	CILOs	Clinical cases	No. of Weeks	contact hours
1	<b>Gynelogoical disorders</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Peptic ulcer</li> <li>• Irritable colon syndrome</li> </ul>	2	4
2	<b>Respiratory system diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Bronchial asthma</li> <li>• Tuberculosis</li> </ul>	2	4
3	<b>CVS diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Hypertension</li> <li>• Angina</li> </ul>	2	4
4	<b>Renal system diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Renal failure</li> </ul>	1	4
5	<b>Endocrinologic diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Diabetes mellitus</li> <li>• Thyroid disorder</li> </ul>	2	4
6	<b>Infective diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Toxoplasmosis</li> <li>• AIDS</li> </ul>	2	4
7	<b>Pregnantpatients</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Constipation and vomiting</li> <li>• diabetes</li> <li>• hypertension</li> </ul>	1	2
8	<b>Lactating women Patients</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• mastitis</li> <li>• lack of lactation</li> </ul>	1	2

9	<b>Pediatric patients</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Sever Bacterial infection</li> <li>• Dehydration</li> </ul>	1	2
10	<b>Geriatrics patients</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• B- blockers use in elderly patients</li> <li>• Analgesics for rheumatism</li> </ul>	1	2
FINAL - EXAM				1	2
TOTAL				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	Units

## V. Teaching strategies of the course:

**Seminars:** these are mainly used with small groups of students (20-30) students in which they find better chances for discussing and participating in the teaching process.

**Feed-back learning:** students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	10	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, d1, d2, d3, d4
2	Seminar assessment	4, 14	10	40	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4
5	Final exam of theoretical part (written exam)	17	60	50	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4
<b>TOTAL</b>			100	100 %	100

The seminar weight will be assessed (for the students group as one unit) as follows:

Items	Weight	Aligned Course Learning Outcomes (CILOs)
Presentation	10 %	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, d1, d2, d3, d4
Solving of the Case study questions	20 %	
Discussion	10 %	
<b>Total</b>	<b>40 %</b>	



## VII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. SorayaDhillon, Rebekah Raymond, Pharmacy Case Studies, 2009, pharmaceutical press

### 2- Essential References.

2. Markus Muller, Clinical pharmacology: current topics and case studies, 2010, Springer-Verlagl Wien
3. Yadv. Hand book of clinical pharmacy
4. Gillmer. 100 cases for students of medicine

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

**Medical sciences college**

Department: pharmacy

**Title of the Program: PHARMACY BACHELOR**

## **Course Plan (Syllabus) of INTEGRATED CASE-BASED LEARNING I**

<b>I. - Information about Faculty Member Responsible for the Course:</b>							
<b>Name of Faculty Member</b>		<b>Office Hours</b>					
<b>Location &amp; Telephone No.</b>	Pharmacy department	<b>SAT</b>	<b>SUN</b>	<b>MON</b>	<b>TUE</b>	<b>WED</b>	<b>THU</b>
<b>E-mail</b>							

### **II. Course Description:**

The course is designed to augment the course of clinical pharmacy (I) and pharmacotherapy (I) by seminar discussion of selected clinical cases.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A4	a1. Comprehend his/her role as a pharmacist in studying patient cases and solving case problems.
2.	B1	b1. Interpret clinical and investigational data.
3.	B1	b2. Solve patient-case problems including defining therapeutic goals, designing a therapeutic regimen, monitoring of drug therapy.
4.	B2	b3. Relate between patient case data and drug selection.
5.	B1	b4. Design a therapeutic regimen to patient case.
6.	B1	b5. Predict the outcomes of selected therapy.
7.	B2	b6. Select the appropriate drugs for each patient-case.
8.	C2	c1. Apply knowledge of pharmacology, pharmacotherapy and clinical pharmacy in studying patient cases.
9.	C2	c2. Provide appropriate and effective recommendation to the health care team on drug selection.
10.	C3	c3. Provide effective advices to patients to limit risk factors and to control his/her life style and diet in order to assist drug therapy.
11.	C1	c4. Present and report his/her works correctly using appropriate writing rules and technologies media.
12.	D1	d1. Share successfully in team-work.
13.	D2	d2. Show respect to life and commit to community and patients serving.
14.	D3	d3. Communicate effectively with his/her colleagues
15.	D5	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)

**(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
b2	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
b3	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
b4, b5	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
b6	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)

**(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 , c2, c3	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
c4	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)
d2	Seminar, feed-back learning, Group project	integrated-case base learning

		assessment (seminar r assessment + written exam)
<b>d4</b>	Seminar, feed-back learning, Group project	integrated-case base learning assessment (seminar r assessment + written exam)

## IV. Course Content:

### Seminar Discussion , Presentation and Group system

- The students shall be divided into groups so as to comprehend all cases
- Each group will be assigned to study a given clinical case prepared by the teacher including several questions about the case.
- The group should study the case and answer the associated questions, and then make a seminar presentation in front of the teacher and the other students.
- The presentation should include:
  - Patient's data
  - Clinical features and interpretation
  - Lab. and instrumental investigational data and interpretation
  - Assessment of drug therapy: suitability of drugs to the patient's case, the source of drug therapy problem (if any), the need to change the therapy (if necessary).
- The teacher will prepare further questions about the case

Order	Units/ Topics List	CILOs	Clinical cases	No. of Weeks	contact hours
1	<b>Alimentary system diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Peptic ulcer</li> <li>• Irritable colon syndrome</li> </ul>	2	4
2	<b>Respiratory system diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Bronchial asthma</li> <li>• Tuberculosis</li> </ul>	2	4
3	<b>CVS diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Hypertension</li> <li>• Angina</li> </ul>	2	4
4	<b>Renal system diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Renal failure</li> </ul>	1	4
5	<b>Endocrinologic diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Diabetes mellitus</li> <li>• Thyroid disorder</li> </ul>	2	4
6	<b>Infective diseases</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Toxoplasmosis</li> <li>• AIDS</li> </ul>	2	4
7	<b>Pregnant patients</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Constipation and vomiting</li> <li>• diabetes</li> <li>• hypertension</li> </ul>	1	2
8	<b>Lactating women Patients</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• mastitis</li> <li>• lack of lactation</li> </ul>	1	2

9	<b>Pediatric patients</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• Sever Bacterial infection</li> <li>• Dehydration</li> </ul>	1	2
10	<b>Geriatrics patients</b>	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4,d1,d2, d3,d4	<ul style="list-style-type: none"> <li>• B- blockers use in elderly patients</li> <li>• Analgesics for rheumatism</li> </ul>	1	2
FINAL - EXAM				1	2
TOTAL				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	Units

## V. Teaching strategies of the course:

**Seminars:** these are mainly used with small groups of students (20-30) students in which they find better chances for discussing and participating in the teaching process.

**Feed-back learning:** students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	10	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, d1, d2, d3, d4
2	Seminar assessment	4, 14	10	40	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4
5	Final exam of theoretical part (written exam)	17	60	50	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4
<b>TOTAL</b>			100	100 %	100

The seminar weight will be assessed (for the students group as one unit) as follows:

Items	Weight	Aligned Course Learning Outcomes (CILOs)
Presentation	10 %	a1, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, d1, d2, d3, d4
Solving of the Case study questions	20 %	
Discussion	10 %	
<b>Total</b>	<b>40 %</b>	



## VII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. SorayaDhillon, Rebekah Raymond, Pharmacy Case Studies, 2009, pharmaceutical press

### 2- Essential References.

1. Markus Muller, Clinical pharmacology: current topics and case studies, 2010, Springer-Verlagl Wien
2. Yadv. Hand book of clinical pharmacy
3. Gillmer. 100 cases for students of medicine

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## VIII. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecturewill not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the examwill not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PHARMACEUTICAL INSTRUMENTAL ANALYSIS III

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	PHARMACEUTICAL INSTRUMENTAL ANALYSIS I					
2.	Course Code & Number:	PHRM 10					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( <i>FOURTH</i> ) Year – ( <i>1<sup>ST</sup></i> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General chemistry</li> <li>Analytical chemistry</li> <li>Pharmaceutical instrumental analysis III</li> </ul>					
6.	Co –requisite (if any):	none					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course deals with the study of essential principles, instrumentation and pharmaceutical applications of advanced spectrophotometric, spectroscopic and chromatographic techniques.

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A2	a1. Explicit the physicochemical properties of matters that are used as basis for qualitative and quantitative instrumental analysis.
2.	A3	a2. Discuss the principles, instrumentations and pharmaceutical applications of advanced spectrophotometric, spectroscopic and chromatographic techniques.
3.	A4	a3. Comprehend his/her role as a pharmacist in providing precise and accurate analytical results based on implementing strict standard operative and analytical procedures.
4.	B1	b1. Interpret correctly outcome data of an instrumental analysis.
5.		b2. Solve problems related to the studied instrumental analytical techniques including identification and/or quantitation of test samples.
6.	B2	b3. Classify instrumental analytical techniques based on their principles and applications.
7.		b4. Compare between various types of advanced instrumental analytical techniques.
8.	B4	b5. Assess the accuracy and precision of an advanced instrumental analytical techniques.
9.		b6. Select the appropriate technique to perform an advanced instrumental quantitative/qualitative analysis.
10.	C1	c1. Handle efficiently the tools and chemicals used in pharmaceutical instrumental analysis Lab.
11.		c2. Operate successfully the instruments used in pharmaceutical instrumental analysis Lab.
12.	C2	c3. Perform effectively the experiments and practical tasks including qualitative and quantitative analysis of substances in a given sample using standard procedures.
13.	C3	c4. Take the required safety criteria during performing different types of practical and professional pharmacy works.
14.	C4	c5. Search efficiently for information using documented and electronic sources of information.
15.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.

16.	D1	d1. Share successfully in team-work.
17.	D2	d2. Communicate effectively with his/her colleagues.
18.	D3	d3. Behave in discipline during practicing practical and professional works and assignments.
19.	D5	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

2. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2	Lecture	Written exam , Attendance
a3	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b2	Lecture laboratory practice Feed-back learning	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam) Assignments , quizzes
b3, b4	Lecture	Written exam , Attendance
b5, b6	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment,

		oral/written exam , practical exam)
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments

IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Advanced chromatographic techniques</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<p><b>Theoretical principle and components , components interactions , types, instrumentation, factors affecting, output data, applications in quantitative/qualitative analysis :</b></p> <ul style="list-style-type: none"> <li>• High performance liquid chromatography (HPLC)</li> <li>• Ultra High performance liquid chromatography (UHPLC)</li> <li>• Counter-current Chromatography</li> <li>• Gas chromatography: gel –liquid, capillary-electrophoresis</li> </ul>	5	10
2	<b>advanced spectroscopic techniques</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• Infrared applications in determination of unknown substances ; with examples</li> </ul>	2	4
• mid-term exam				1	2
2	<b>advanced spectroscopic techniques</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<p><b>Theoretical principle and components , components interactions , types, instrumentation, factors affecting, output data, applications in quantitative/qualitative analysis :</b></p> <ul style="list-style-type: none"> <li>○ Mass spectroscopy</li> <li>○ Nuclear magnetic resonance (NMR)</li> </ul>	6	8
<b>Course Review</b>		a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32

<b>Number of Weeks /and Units Per Semester</b>	16 weeks	2 Units
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<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>AlignedCourse Intended Learning Outcomes CILOs</b>
1.	determination of drugs in different dosage forms using HPLC : <ul style="list-style-type: none"> <li>• Ketoprofen tablets</li> <li>• Amikacin injections</li> <li>• Amlodipine tablets</li> <li>• Cephadrine capsules</li> <li>• Paracetamol + caffeine tablets</li> <li>• Pseudoephedrine + cetirizine capsules</li> <li>• Drotaverine + codeine tablets</li> <li>• Miconazole + hydrocortisone oral gel</li> </ul>	8	10	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
2.	Gas chromatography quantitative analysis of drugs and phytochemicals : <ul style="list-style-type: none"> <li>• Analysis of phytosterol in plants</li> <li>• Study of essential oils in plant extracts</li> <li>• Analysis of dextromethorphan metabolite in urine</li> </ul>	3	6	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to solve the problems provided by the teacher at the end of each unit.	b2, c5, c6, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to provide a video of simulation of one of the analytical technique studied. The students of each group must explain the simulation for other students.	c5, c6, d1, d2, d4	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2 , a3, b1, b2, b3b4,b7, b5, b6, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b2, c5, c6, d1, d2, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b1, b2
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2 , a3, b1, b2, b3b4,b7, b5, b6, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, , b1, b2, b1, b2, b5, b6, c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
2	Lab. Attitude	weekly	2	2	c4, d1, d2, d3
3	Lab. Accomplishments	weekly	5	5	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d4
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, b1, b2, b1, b2, b5, b6
6	Practical exam (practical)	14	20	20	a1, a2, , b1, b2, b1, b2, b5, b6, c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. David Harvey, modern analytical chemistry, 2000, McGraw-Hill
2. British pharmacopeia 2013

### 2- Essential References.

1. Hadkar. Instrumental methods in pharmaceutical analysis
2. Purcell. Pharmaceutical analysis

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of

### Pharmaceutical instrumental analysis III

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

#### II. Course Description:

The course deals with the study of essential principles, instrumentation and pharmaceutical applications of advanced spectrophotometric, spectroscopic and chromatographic techniques.

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A2	a1. Explicit the physicochemical properties of matters that are used as basis for qualitative and quantitative instrumental analysis.
2.	A3	a2. Discuss the principles, instrumentations and pharmaceutical applications of advanced spectrophotometric, spectroscopic and chromatographic techniques.
3.	A4	a3. Comprehend his/her role as a pharmacist in providing precise and accurate analytical results based on implementing strict standard operative and analytical procedures.
4.	B1	b1. Interpret correctly outcome data of an instrumental analysis.
5.		b2. Solve problems related to the studied instrumental analytical techniques including identification and/or quantitation of test samples.
6.	B2	b3 .Classifyinstrumental analytical techniquesbased on their principles and applications.
7.		b4. Compare between various types of advanced instrumental analytical techniques.
8.	B4	b5. Assess the accuracy and precision of an advanced instrumental analytical techniques.
9.		b6. Select the appropriate technique to perform an advanced instrumental quantitative/qualitative analysis.
10.	C1	c1.Handleefficiently the tools and chemicals used in pharmaceutical instrumental analysis Lab.
11.		c2. Operate successfully the instruments used in pharmaceutical instrumental analysis Lab.
12.	C2	c3 . Perform effectively the experiments and practical tasks including qualitative and quantitative analysis of substances in a given sample using standard procedures.
13.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.
14.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
15.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.

16.	D1	d1. Share successfully in team-work.
17.	D2	d2. Communicate effectively with his/her colleagues.
18.	D3	d3. Behave in discipline during practicing practical and professional works and assignments.
19.	D5	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

2. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2	Lecture	Written exam , Attendance
a3	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b2	Lecture laboratory practice Feed-back learning	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam) Assignments , quizzes
b3, b4	Lecture	Written exam , Attendance
b5, b6	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment,

		oral/written exam , practical exam)
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments

IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Advanced chromatographic techniques</b>		<b>principle, types, apparatus, applications</b> <ul style="list-style-type: none"> <li>High performance liquid chromatography (HPLC)</li> <li>Ultra High performance liquid chromatography (UHPLC)</li> <li>Counter-current Chromatography</li> <li>Gas chromatography: gel –liquid, capillary-column</li> </ul>	5	10
2	<b>advanced spectroscopic techniques</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>Infrared applications in determination of unknown substances ; with examples</li> </ul>	2	4
	<b>• mid-term exam</b>			1	2
2	<b>advanced spectroscopic techniques</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	Principles, instrumentation, applications, interpretation of outcome data ( with problems solving) of : <ul style="list-style-type: none"> <li>Mass spectroscopy</li> <li>Nuclear magnetic resonance (NMR)</li> </ul>	6	8
	<b>Course Review</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				<b>16</b>	<b>32</b>
<b>Number of Weeks /and Units Per Semester</b>				<b>16 weeks</b>	<b>2 Units</b>

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Intended Learning Outcomes CILOs</b>
<b>1.</b>	determination of drugs in different dosage forms using HPLC : <ul style="list-style-type: none"> <li>• Ketoprofen tablets</li> <li>• Amikacin injections</li> <li>• Amlodipine tablets</li> <li>• Cephadrine capsules</li> <li>• Paracetamol + caffeine tablets</li> <li>• Pseudoephedrine + cetirizine capsules</li> <li>• Drotaverine + codeine tablets</li> <li>• Miconazole + hydrocortisone oral gel</li> </ul>	<b>8</b>	<b>10</b>	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
<b>2.</b>	Gas chromatography quantitative analysis of drugs and phytochemicals : <ul style="list-style-type: none"> <li>• Analysis of phytosterol in plants</li> <li>• Study of essential oils in plant extracts</li> </ul>	<b>3</b>	<b>6</b>	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## VI. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to solve the problems provided by the teacher at the end of each unit.	b2, c5, c6, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to provide a video of simulation of one of the analytical technique studied. The students of each group must explain the simulation for other students.	c5, c6, d1, d2, d4	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2 , a3, b1, b2, b3b4,b7, b5, b6, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b2, c5, c6, d1, d2, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b1, b2
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2 , a3, b1, b2, b3b4,b7, b5, b6, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, , b1, b2, b1, b2, b5, b6, c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
2	Lab. Attitude	weekly	2	2	c4, d1, d2, d3
3	Lab. Accomplishments	weekly	5	5	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d4
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, b1, b2, b1, b2, b5, b6
6	Practical exam (practical)	14	20	20	a1, a2, , b1, b2, b1, b2, b5, b6, c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
Total			40	40 %	

## IX. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

3. David Harvey, modern analytical chemistry, 2000, McGraw-Hill
4. British pharmacopeia 2013

### 2- Essential References.

3. Hadkar. Instrumental methods in pharmaceutical analysis
4. Purcell. Pharmaceutical analysis

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification **PHARMACOTHERAPY II**

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	PHARMACOTHERAPY II					
2.	Course Code & Number:	PHRC 07					
3.	Credit hours:	C.H				TOT AL	
		Theoretical			P		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( FOURTH ) Year – ( 1 <sup>ST</sup> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>• General biology</li> <li>• Anatomy and histology</li> <li>• Physiology I &amp; II</li> <li>• Pathology</li> <li>• Pathophysiology</li> <li>• Pharmacology I , II &amp; III</li> <li>• Pharmacotherapy I</li> </ul>					
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>• Clinical pharmacy II</li> <li>• Integrated- case based learning II</li> </ul>					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10.	Prepared By:						
11.	Date of Approval	10/2014					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course deals with the study of the therapeutic goals, selection of drugs (first choices , alternatives, supportive) and the standard therapeutic protocols (plans) for treatment of common diseases . This course is complementary to pathophysiology and pharmacology I , II & III courses and is supportive for clinical pharmacy , pharmacy practice skills, and integrated-case based learning" courses. The course concerns with drug therapy of gynecological, immunological, ophthalmic, hematological disorders , parasitic infections and cancer is complementary for pharmacotherapy I course.

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A1	a1. Determine therapeutic goals and drug benefits during treating of diseases.
2.	A2	a2. Determine the appropriate drugs (first choices, alternatives and supportive) for treatment of common diseases.
3.	A3	a3. Discuss the international (WHO, FDA or NHS or others) and the local (if any) therapeutic protocol for treatment of diseases.
4.	A4	a4. Comprehend his/her role as a pharmacist in defining therapeutic goals, selection of appropriate drugs and implementing therapeutic protocols for the favor of optimal treating of diseases.
5.	B1	b1. Differentiate between essential and supportive drugs for management of common diseases.
6.	B2	b2. Classify drugs to be used for management of common diseases into essential, prophylactic and supportive drugs.
7.		b3. Compare between drugs based on benefit/ risk ratio.
8.		b4. Relate the drug selection to case (patient), appropriateness, availability and other factors.
9.	B3	b5. Design a therapeutic protocol for treating common diseases.
10.		b6. Predict the expected risks of using a drug in treatment of common diseases.
11.	B4	b7. Assess the appropriateness of drugs prescribed/recommended for management of common diseases.
12.		b8. Select the drug of choice and other complementary drugs appropriately for management of common diseases.
13.	C2	c1. Provide a correct information to the health care team regarding therapeutic goals and therapeutic protocol and drug selection
14.		c2. Recommend drugs of first choice to the health care team.
15.	C4	c3. Search efficiently for information using documented and electronic sources of information.
16.		c4. Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	d1. Share successfully in team-work.

18.	D2	d2. Show respect to life and commit to community and patients serving.
19.	D3	d3. Communicate effectively with his/her colleagues.
20.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
21.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

2. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture, feed-back learning	Written exam , Attendance, assignments
a3	Lecture	Written exam , Attendance
a4	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture	Written exam , Attendance,
b2, b3, b4	Lecture, feed-back learning	Written exam , Attendance, assignment
b5, b6	Lecture, feed-back learning	Written exam , Attendance, quizzes
b7, b8	Lecture, feed-back learning	Written exam , Attendance, quizzes
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	lecture	Written exam , Attendance
c3	feed-back learning, Group-project	Assignments
c4	Feed-back learning	Assignments

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	Feed-back learning	Assignments

<b>IV. Course Content:</b>					
<b>Order</b>	<b>Units/ Topics List</b>	<b>CILOs</b>	<b>Sub Topics List</b>	<b>No. of Weeks</b>	<b>contact hours</b>
Therapeutic goals, therapeutic protocols and drug selection (essential " (first choice, alternative), supportive , prophylactic for therapy of the following diseases/disorders					
1	<b>Gynecological disorders</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	1. Amenorrhea 2. Endometriosis	2	4
2	<b>Immunologic disorders</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	1. Allergy 2. Systemic Lupus Erythematosus	1	2
3	<b>Ophthalmic disorders</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	1. Glaucoma 2. Corneal ulcer	2	4
4	<b>Bone and joint disorders</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	1. Rhuematiod arthritis and Rheumatism 2. Osteoporosis and osteomlcia	2	4
<b>MID-TERM EXAM</b>				1	2
5	<b>Hematologic disorders</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	1. Anemias 3. Coagulation disorders	2	4
6	<b>Parasitic infections</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	1. Malaria 2. Giardiasis and amoebiasis	2	4
7	<b>Cancer</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	1. Leukemia 2. Breast cancer	2	4
<b>Course Review</b>		a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c12,d2, d4	Review of the studied topics	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>					32



Number of Weeks /and Units Per Semester	16 weeks	7 Units
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## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

VI. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve multiple choice questions provided by the teacher. The questions should focus on therapeutic goals, drug of choice, types of drug (essential, supportive, etc.).	b2, b3, b4, c3, c4, d5	4-13	6
2	<b>Group :</b> each group of students will be assigned to provide a search-based report on international + local (if any) therapeutic protocol for treatment of diseases not included in the topics e.g. <ul style="list-style-type: none"> <li>• Polycystic ovaries</li> <li>• Toxoplasmosis</li> <li>• Lung cancer</li> <li>• Thalassemia</li> <li>• Helminth infections</li> <li>• Epilepsy</li> <li>• Psychosis</li> <li>• depression</li> </ul>	c3, c4, d1, d3,d4, d5	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2, d2, d4
2	Assignments (1 + 2)	4, 14	10	10	b2, b3, b4, c3, c4, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b6, b7
4	Mid-semester exam of theoretical part (written exam)	7	20	20	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, d2, d4
5	Final exam of theoretical part (written exam)	17	60	60	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, d2, d4
<b>TOTAL</b>			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Joseph D. Dipiro, pharmacotherapy: a pathological approach, 2005 McGraw-Hill Inc.
<b>2- Essential References.</b>
1. Wells. Pharmacotherapy hand book 2. Satoskar. Pharmacology and pharmacotherapeutics
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Protocol (Syllabus) of PHARMACOTHERAPY II

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	Pr. Dr. Rashad Al-namer	Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
<p>The course deals with the study of the therapeutic goals, selection of drugs (first choices , alternatives, supportive) and the standard therapeutic protocols (plans) for treatment of common diseases . This course is complementary to pathophysiology and pharmacology I , II &amp; III courses and is supportive for clinical pharmacy , pharmacy practice skills, and integrated-case based learning" courses. The course concerns with drug therapy of gynecological, immunological, ophthalmic, hematological disorders , parasitic infections and cancer is complementary for pharmacotherapy I course.</p>

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
3. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A1	a1. Determine therapeutic goals and drug benefits during treating of diseases.
2.	A2	a2. Determine the appropriate drugs (first choices , alternatives and supportive) for treatment of common diseases.
3.	A3	a3. Discuss the international (WHO, FDA or NHS or others) and the local (if any) therapeutic protocol for treatment of diseases.
4.	A4	a4. Comprehend his/her role as a pharmacist in defining therapeutic goals, selection of appropriate drugs and implementing therapeutic protocols for the favor of optimal treating of diseases.
5.	B1	b1. Differentiate between essential and supportive drugs for management of common diseases.
6.	B2	b2 .Classify drugs to be used for management of common diseases into essential, prophylactic and supportive drugs.
7.		b3. Compare between drugs based on benefit/ risk ratio.
8.		b4. Relate the drug selection to case (patient), appropriateness, availability and other factors.
9.	B3	b5. Design a therapeutic protocol for treating common diseases.
10.		b6. Predict the expected risks of using a drug in treatment of common diseases.
11.	B4	b7 . Assess the appropriateness of drugs prescribed/recommended for management of common diseases.
12.		b8. Select the drug of choice and other complementary drugs appropriately for management of common diseases.
13.	C2	c1. Provide a correct information to the health care team regarding therapeutic goals and therapeutic protocol and drug selection
14.		c2. Recommend drugs of first choice to the health care team.
15.	C4	c3 .Search efficiently for information using documented and electronic sources of information.
16.		c4. Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	d1. Share successfully in team-work.

18.	D2	d2. Show respect to life and commit to community and patients serving.
19.	D3	d3. Communicate effectively with his/her colleagues.
20.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
21.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

4. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture, feed-back learning	Written exam , Attendance, assignments
a3	Lecture	Written exam , Attendance
a4	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture	Written exam , Attendance,
b2, b3, b4	Lecture, feed-back learning	Written exam , Attendance, assignment
b5, b6	Lecture, feed-back learning	Written exam , Attendance, quizzes
b7, b8	Lecture, feed-back learning	Written exam , Attendance, quizzes
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	lecture	Written exam , Attendance
c3	feed-back learning, Group-project	Assignments
c4	Feed-back learning	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies

Outcomes		
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	Feed-back learning	Assignments



<b>V. Course Content:</b>					
<b>Order</b>	<b>Units/ Topics List</b>	<b>CILOs</b>	<b>Sub Topics List</b>	<b>No. of Weeks</b>	<b>contact hours</b>
Therapeutic goals, therapeutic protocols and drug selection (essential " (first choice, alternative), supportive , prophylactic for therapy of the following diseases/disorders					
1	<b>Gynecological disorders</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	1. Amenorrhea 2. Endometriosis	2	4
2	<b>Immunologic disorders</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	1. Allergy 2. Systemic Lupus Erythematosus	1	2
3	<b>Ophthalmic disorders</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	3. Glaucoma 4. Corneal ulcer	2	4
4	<b>Bone and joint disorders</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	3. Rhuematiod arthritis and Rheumatism 4. Osteoporosis and osteomalacia	2	4
<b>MID-TERM EXAM</b>				1	2
5	<b>Hematologic disorders</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	1. Anemias 3. Coagulation disorders	2	4
6	<b>Parasitic infections</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	1. Malaria 2. Giardiasis and amoebiasis	2	4
7	<b>Cancer</b>	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2,d2, d4	1. Leukemia 2. Breast cancer	2	4
<b>Course Review</b>		a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c12,d2, d4	Review of the studied topics	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>					32

Number of Weeks /and Units Per Semester	16 weeks	7 Units
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## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to solve multiple choice questions provided by the teacher. The questions should focus on therapeutic goals, drug of choice, types of drug (essential, supportive, etc.).	b2, b3, b4, c3, c4, d5	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report on international + local (if any) therapeutic protocol for treatment of diseases not included in the topics e.g. <ul style="list-style-type: none"> <li>• Polycystic ovaries</li> <li>• Toxoplasmosis</li> <li>• Lung cancer</li> <li>• Thalassemia</li> <li>• Helminthes infections</li> <li>• Epilepsy</li> <li>• Psychosis</li> <li>• depression</li> </ul>	c3, c4, d1, d3,d4, d5	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, c2, d2, d4
2	Assignments (1 + 2)	4, 14	10	10	b2, b3, b4, c3, c4, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b6, b7
4	Mid-semester exam of theoretical part (written exam)	7	20	20	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, d2, d4
5	Final exam of theoretical part (written exam)	17	60	60	a1, a2, a3, a4, b1, b2, b4, b5, b6, b7, b8, c1, d2, d4
TOTAL			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Joseph D. Dipiro, pharmacotherapy: a pathological approach, 2005 McGraw-Hill Inc.
<b>2- Essential References.</b>
1. Wells. Pharmacotherapy hand book 2. Satoskar. Pharmacology and pharmacotherapeutics
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### EXPERIMENTAL PHARMACOLOGY

<b>I. Course Identification and General Information:</b>						
1.	Course Title:	EXPERIMENTAL PHARMACOLOGY				
2.	Course Code & Number:	PHRC 08				
3.	Credit hours:	C.H			TOTAL	
		Theoretical				P.
		L.	Tut.	S.		
		2	-	-		1
4.	Study level/ semester at which this course is offered:	( <i>FOURTH</i> ) Year – ( <i>1<sup>ST</sup></i> ) semester				
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General biology</li> <li>Anatomy and histology</li> <li>Physiology i &amp; ii</li> <li>Pathology</li> <li>Pathophysiology</li> <li>Pharmacology i, ii &amp; iii</li> </ul>				
6.	Co –requisite (if any):	None				
7.	Program (s) in which the course is offered:	All BC programs offered by the university				
8.	Language of teaching the course:	ENGLISH				
9.	Location of teaching the course:	IN THE UNIVERSITY				
10	Prepared By:					
11	Date of Approval	<b>10/2014</b>				

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course deals with the study of experiments related to study of drug effects on animals. Therefore, this course is a complementary of the previously studied pharmacology courses. The course also provides students with practical skills of pharmacology.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A1	a1. Identify types of animals used for testing of drugs.
2.	A2	a2. Determine the types of drug effects and toxicity of drugs tested on experimental animals.
3.	A3	a3. Explicit the techniques and approaches of experimenting drugs on animals as well as the alternative methods in which animals are not used such as simulation .
4.	A4	a4. Comprehend his/her role as a pharmacist in implementing ethics and laws regulations while experimenting drugs on animals and employing alternative methods for drug testing.
5.	B1	b1. Interpret outcome data obtained after a pharmacologic experiment.
6.	B2	b2 . Classify the drug effects tested on animals.
7.	B4	b3 . Assess the effect of the drug on the tested animals.
8.	C1	c1.Handle efficiently the tools and chemicals used in pharmacology Lab.
9.	C1	c2. Operate successfully the instruments used in pharmacology Lab.
10.	C2	c3 . Perform effectively the experiments , practical tasks including experimenting of drugs on animals using standard procedures.
11.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.
12.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
13.	C4	c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
14.	D1	d1. Share successfully in team-work.
15.	D2	d2. Show respect to life and commit to community and patients serving.
16.	D3	d3. Communicate effectively with his/her colleagues.
17.	D4	d4.Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
18.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture , laboratory practice	Written exam , Attendance, Practical assessment (Lab. attendance, accomplishment)
a3	Lecture	Written exam , Attendance
a4	Lecture, laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b2	Lecture	Written exam , Attendance
b3	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments

c6	laboratory practice Feed-back learning Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments Assignment, Graduation project assessment
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d3, d4	laboratory practice	Practical assessment (Lab. attendance, attitude, practical exam)
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice	Practical assessment (Lab. attendance, accomplishment, practical exam)
d5	Feed-back learning	Assignments



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>introduction to experimental pharmacology</b>	a1, a3, a4, d2	<ul style="list-style-type: none"> <li>• Definition of terms: experimental pharmacology, experimental animals</li> <li>• Objectives of experimental pharmacology</li> <li>• Brief history of experimental pharmacology</li> <li>• Approaches : in vivo testing, in vitro testing, vivisection , etc.</li> </ul>	1	2
2	<b>experimental animals</b>	a1, a4, d2	<ul style="list-style-type: none"> <li>• Handling of experimental animals</li> <li>• Requirements (food, homes, light, etc.) of animals cages.</li> <li>• Types and specifications of experimental animals:               <ul style="list-style-type: none"> <li>○ Invertebrates : fruit flies (Drosophila)</li> <li>○ Vertebrates: fishes, cats, dogs, frogs, rabbits, rats, monkey ,etc.</li> </ul> </li> </ul>	2	4
3	<b>Applied experimental pharmacology researches</b>	a2, a3, a4, b1, b2, b3, d2	<p>Procedures and objectives of researches focusing on :</p> <ul style="list-style-type: none"> <li>• Drug testing</li> <li>• Drug safety testing</li> <li>• Xenotransplantation</li> <li>• Cosmetic testing</li> <li>• Genetic-modifying testing</li> <li>• others</li> </ul>	2	4
4	<b>Drug safety testing</b>	a2, a3, a4, b1, b2, b3, d2	<p>Procedure and objectives of :</p> <ul style="list-style-type: none"> <li>• LD<sub>50</sub> test</li> <li>• Eye irritancy</li> <li>• Skin irritation</li> <li>• Mutagenicity &amp; carcinogenicity</li> <li>• Toxikinetik &amp; ADME</li> <li>• Metabolic toxicity</li> </ul>	2	4

Mid-term exam				1	2
	<b>Drug safety testing</b>	a2, a3, a4, b1, b2, b3, d2	Procedure and objectives <ul style="list-style-type: none"> <li>• Pyrogen testing</li> <li>• Phototoxicity</li> <li>• Embryotoxicity</li> <li>• Endocrine disrupts</li> <li>• Ecotoxicity</li> <li>• Toxicogenomics</li> </ul>	2	4
5	<b>Ethics , regulations &amp; laws of using experimental animals</b>	a4	<ul style="list-style-type: none"> <li>• Ethics of use of experimental animals : The three Rs (replacement, refinement, reduction)</li> <li>• Regulations e.g. animal welfare act</li> </ul>	2	4
6	<b>Alternatives to animal testing</b>	a3, a4	<ul style="list-style-type: none"> <li>• Organs-on-a-chip</li> <li>• In silico : computer simulation</li> <li>• Microdosing</li> <li>• Position emission tomography</li> </ul>	2	4
<b>Course Review</b>		a1, a2, a3, a4, b1, b2, b3, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Intended Learning Outcomes CIOs</b>
1.	Introduction to pharmacology Lab.: safety requirements, list of experiments, handling animals, how to report, etc.	1	2	a1, a2, a3, a4, b1, b3, c1, c2, c3, c4, c6, d1, d2, d4, d5
2.	Testing of drug effects on rabbit eyes: miotics, mydriatics, normal saline	2	4	a1, a2, a3, a4, b1, b3, c1, c2, c3, c4, c6, d1, d2, d4, d5
3.	Testing of skin irritation of dermatological products on animals: (ciprofloxacin cream), tetracycline ointments, ketoprofen gel	2	4	a1, a2, a3, a4, b1, b3, c1, c2, c3, c4, c6, d1, d2, d4, d5
4.	Testing of eye irritancy of solutions : eye washes	1	2	a1, a2, a3, a4, b1, b3, c1, c2, c3, c4, c6, d1, d2, d4, d5
5.	testing of LD <sub>50</sub> of drugs : warfarin, digoxin	2	4	a1, a2, a3, a4, b1, b3, c1, c2, c3, c4, c6, d1, d2, d4, d5
6.	Pyrogen testing of parenteral injections: vitamin B complex ampoules, sterile water for injection	2	4	a1, a2, a3, a4, b1, b3, c1, c2, c3, c4, c6, d1, d2, d4, d5
7.	Review	1	2	a1, a2, a3, a4, b1, b3, c1, c2, c3, c4, c6, d1, d2, d4, d5
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student will be assigned to provide a search-based report supported with illustrating videos on drug testing on animals.	c5, c6, d5	4-13	3
2	<b>Group</b> : every group of students will be assigned to provide a search-based report on other alternative methods for testing drugs studied in the course.	c5, c6, d1, d3, d5	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, a4, b1, b2, b3, d2
2	Assignments (1 + 2)	4, 14	5	5	b4, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b1, b3
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, a4, b1, b2, b3, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, a3, a4, b1, b3, c1, c2, c3, c4, c6, d1, d2, d4, d5
2	Lab. Attitude	weekly	2.5	2.5	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a1, a2, a3, a4, b1, b3, c1, c2, c3, c4, c6, d1, d5
4	Lab. Reporting	weekly	2.5	2.5	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, b1, b2, b1, b4, b3, b11
6	Practical exam (practical)	14	20	20	b1, b4, b3, b11, c1, c2, c3, c4, c5, c4, c6
Total			40	40 %	

<b>VIII. Learning Resources:</b>	
<b>1- Required Textbook(s) ( maximum two ).</b>	
1. Rosenthal, Walte, Handbook of Experimental Pharmacology, Springer, 2004	
<b>2- Essential References.</b>	
1. Dinseh Badyal, Practical manual of pharmacology , Jaypee, India, 2008	
<b>3- Electronic Materials and Web Sites etc.</b>	
1. <a href="https://en.wikipedia.org/wiki/Animal_testing">https://en.wikipedia.org/wiki/Animal_testing</a>	
2. <a href="http://www.neavs.org/research/testing">www.neavs.org/research/testing</a>	

<b>IX. Course Policies:</b>	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of EXPERIMENTAL PHARMACOLOGY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	Pr.Dr. Rashad Alnamer	Office Hours					
Location & Telephone No.	Pharmacy department ; 774871511	SAT	SUN	MON	TUE	WED	THU
E-mail	yemtiger1@yahoo.com						

II. Course Description:
<p>The course deals with the study of experiments related to study of drug effects on animals. Therefore, this course is a complementary of the previously studied pharmacology courses. The course also provides students with practical skills of pharmacology.</p>

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A1	a1. Identify types of animals used for testing of drugs.
2.	A2	a2. Determine the types of drug effects and toxicity of drugs tested on experimental animals.
3.	A3	a3. Explicit the techniques and approaches of experimenting drugs on animals as well as the alternative methods in which animals are not used such as simulation .
4.	A4	a4. Comprehend his/her role as a pharmacist in implementing ethics and laws regulations while experimenting drugs on animals and employing alternative methods for drug testing.
5.	B1	b1. Interpret outcome data obtained after a pharmacologic experiment.
6.	B2	b2 . Classify the drug effects tested on animals.
7.	B4	b3 . Assess the effect of the drug on the tested animals.
8.	C1	c1.Handle efficiently the tools and chemicals used in pharmacology Lab.
9.		c2. Operate successfully the instruments used in pharmacology Lab.
10.	C2	c3 . Perform effectively the experiments , practical tasks including experimenting of drugs on animals using standard procedures.
11.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.
12.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
13.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
14.	D1	d1. Share successfully in team-work.
15.	D2	d2. Show respect to life and commit to community and patients serving.
16.	D3	d3. Communicate effectively with his/her colleagues.
17.	D4	d4.Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
18.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture , laboratory practice	Written exam , Attendance, Practical assessment (Lab. attendance, accomplishment)
a3	Lecture	Written exam , Attendance
a4	Lecture, laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b2	Lecture	Written exam , Attendance
b3	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments

c6	laboratory practice Feed-back learning Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments Assignment, Graduation project assessment
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**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice	Practical assessment (Lab. attendance, attitude, practical exam)
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice	Practical assessment (Lab. attendance, accomplishment, practical exam)
d5	Feed-back learning	Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>introduction to experimental pharmacology</b>	a1, a3, a4, d2	<ul style="list-style-type: none"> <li>• Definition of terms: experimental pharmacology, experimental animals</li> <li>• Objectives of experimental pharmacology</li> <li>• Brief history of experimental pharmacology</li> <li>• Approaches : in vivo testing, in vitro testing, vivisection , etc</li> </ul>	1	2
2	<b>experimental animals</b>	a1, a4, d2	<ul style="list-style-type: none"> <li>• Handling of experimental animals</li> <li>• Requirements (food, homes, light, etc.) of animals cages.</li> <li>• Types and specifications of experimental animals:               <ul style="list-style-type: none"> <li>○ Invertebrates : fruit flies (Drosophila)</li> <li>○ Vertebrates: fishes, cats, dogs, frogs, rabbits, rats, monkey ,etc.</li> </ul> </li> </ul>	2	4
3	<b>Applied experimental pharmacology researches</b>	a2, a3, a4, b1, b2, b3, d2	<p>Procedures and objectives of researches :</p> <ul style="list-style-type: none"> <li>• Drug testing</li> <li>• Drug safety testing</li> <li>• Xenotransplantation</li> <li>• Cosmetic testing</li> <li>• Genetic-modifying testing</li> <li>• others</li> </ul>	2	4
4	<b>Drug safety testing</b>	a2, a3, a4, b1, b2, b3, d2	<p>Procedure and objectives</p> <ul style="list-style-type: none"> <li>• LD50 test</li> <li>• Eye irritancy</li> <li>• Skin irritation</li> <li>• Mutagenicity &amp; carcinogenicity</li> <li>• Toxiketic &amp; ADME</li> <li>• Metabolic toxicity</li> <li>•</li> </ul>	2	4

Mid-term exam				1	2
	<b>Drug safety testing</b>	a2, a3, a4, b1, b2, b3, d2	Procedure and objectives <ul style="list-style-type: none"> <li>• Pyrogen testing</li> <li>• Phototoxicity</li> <li>• Embryotoxicity</li> <li>• Endocrine disrupts</li> <li>• Ecotoxicity</li> <li>• Toxicogenomics</li> </ul>	2	4
5	<b>Ethics , regulations &amp; laws of using experimental animals</b>	a4	<ul style="list-style-type: none"> <li>• Ethics of use of experimental animals : The three Rs (replacement, refinement, reduction)</li> <li>• Regulations e.g. animal welfare act</li> </ul>	2	4
6	<b>Alternatives to animal testing</b>	a3, a4	<ul style="list-style-type: none"> <li>• Organs-on-a-chip</li> <li>• In silico : computer simulation</li> <li>• Microdosing</li> <li>• Position emission tomography</li> </ul>	2	4
<b>Course Review</b>		a1, a2, a3, a4, b1, b2, b3, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Intended Learning Outcomes CIOs</b>
1.	Introduction to pharmacology Lab.: safety requirements, list of experiments, handling animals, how to report, etc.	1	2	a1, a2, a3, a4, b1, b3, c1, c2, c3, c4, c6, d1, d2, d4, d5
2.	Testing of drug effects on rabbit eyes: miotics, mydriatics, normal saline	2	4	a1, a2, a3, a4, b1, b3, c1, c2, c3, c4, c6, d1, d2, d4, d5
3.	Testing of skin irritation of dermatological products on animals: (ciprofloxacin cream), tetracycline ointments, ketoprofen gel	2	4	a1, a2, a3, a4, b1, b3, c1, c2, c3, c4, c6, d1, d2, d4, d5
4.	Testing of eye irritancy of solutions : eye washes	1	2	a1, a2, a3, a4, b1, b3, c1, c2, c3, c4, c6, d1, d2, d4, d5
5.	testing of LD <sub>50</sub> of drugs : warfarin, digoxin	2	4	a1, a2, a3, a4, b1, b3, c1, c2, c3, c4, c6, d1, d2, d4, d5
6.	Pyrogen testing of parenteral injections: vitamin B complex ampoules, sterile water for injection	2	4	a1, a2, a3, a4, b1, b3, c1, c2, c3, c4, c6, d1, d2, d4, d5
7.	Review	1	2	a1, a2, a3, a4, b1, b3, c1, c2, c3, c4, c6, d1, d2, d4, d5
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student will be assigned to provide a search-based report supported with illustrating videos on drug testing on animals.	c5, c6, d5	4-13	3
2	<b>Group</b> : every group of students will be assigned to provide a search-based report on other alternative methods for testing drugs studied in the course.	c5, c6, d1, d3, d5	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, a4, b1, b2, b3, d2
2	Assignments (1 + 2)	4, 14	5	5	b4, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b1, b3
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a1, a2, a3, a4, b1, b2, b3, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, a3, a4, b1, b3, c1, c2, c3, c4, c6, d1, d2, d4, d5
2	Lab. Attitude	weekly	2.5	2.5	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a1, a2, a3, a4, b1, b3, c1, c2, c3, c4, c6, d1, d5
4	Lab. Reporting	weekly	2.5	2.5	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, b1, b2, b1, b4, b3, b11
6	Practical exam (practical)	14	20	20	b1, b4, b3, b11, c1, c2, c3, c4, c5, c4, c6
Total			40	40 %	

<b>VIII. Learning Resources:</b>	
<b>1- Required Textbook(s) ( maximum two ).</b>	
1. Rosenthal, Walte, Handbook of Experimental Pharmacology, Springer, 2004	
<b>2- Essential References.</b>	
1. Dinseh Badyal, Practical manual of pharmacology , Jaypee, India, 2008	
<b>3- Electronic Materials and Web Sites etc.</b>	
1. <a href="https://en.wikipedia.org/wiki/Animal_testing">https://en.wikipedia.org/wiki/Animal_testing</a>	
2. <a href="http://www.neavs.org/research/testing">www.neavs.org/research/testing</a>	

<b>IX. Course Policies:</b>	
<b>1.</b>	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
<b>2.</b>	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
<b>3.</b>	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
<b>4.</b>	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
<b>5</b>	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
<b>6</b>	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



Medical sciences college

Department: Pharmacy

Title of the Program: PHARMACY BACHELOR

## Course Specification

### HOSPITAL PHARMACY

I. Course Identification and General Information:					
1.	Course Title:	HOSPITAL PHARMACY			
2.	Course Code &Number:	PHRT 15			
3.	Credit hours:	C.H			TOTAL
		Theoretical			
		L.	Tut.	S.	
		2	-	2	
		P.	Tr.		
		-	-	2	
4.	Study level/ semester at which this course is offered:	( FOURTH ) Year – ( 1 <sup>ST</sup> ) semester			
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>• Introduction to pharmacy profession</li> <li>• Pharmaceutical calculations skills</li> <li>• Pharmacology I , II</li> <li>• Clinical pharmacy I</li> </ul>			
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>• None</li> </ul>			
7.	Program (s) in which the course is offered:	All BC programs offered by the university			
8.	Language of teaching the course:	ENGLISH			
9.	Location of teaching the course:	IN THE UNIVERSITY			
10	Prepared By:				
11	Date of Approval	10/2014			

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course is designed to provide the students with essential knowledge and skills necessary to offer hospital pharmaceutical services to in-patient and out-patients in health-care facilities. The course is an introduction to pharmacy training courses starting in the next semester.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Identify types of specific drug products in hospital pharmacy including extemporaneous preparation , mixed IV preparations and total parenteral nutrition (TPN).
2.		a2. Determine the components, advantages and disadvantages of hospital formulary (HF), IV-admixtures and TPN prepared in hospital pharmacy
3.	A3	a3. Explicit hospital pharmacy design, the systems of drug distribution , conditions of storage of drug products in hospitals, pharmacy procurement and the pharmaceutical care services offered by hospital pharmacists to patients in health care facilities.
4.		a4. Grasp knowledge and skills required to practice hospital pharmacy in health care facilities.
5.	A4	a5. Comprehend his/her role as a pharmacist Comprehend his/her role as a pharmacist in offering hospital pharmaceutical care services to in-patient and out-patient and his/her role as a member of the pharmacy & therapeutic committee.
6.	B1	b1. Solve problems related to reparation, storage, administration and dosing of IV admixtures, TPN and other preparations compounded by the pharmacist in hospital pharmacy.
7.	B2	b2 .Classify drug products in hospital pharmacy.
8.	B3	b3. Predict the reason of incompatibilities in IV-admixtures.
9.	B4	b4 . Assess the compatibility of IV-admixtures.
10.		b5. Select the most appropriate condition and place in the pharmacy to store drug products in hospital pharmacy.
11.		C2
12.	c2. Dispense drug products to out-patients using standard optimal system.	
13.	c3. Avoid mixed IV preparations incompatibility and instability.	
14.	c4. Arrange and store drug products correctly in hospital pharmacy .	
15.	c5. Determine the type and quantity of drug products required to be purchased in hospital pharmacy.	
16.	C4	c6 .Search efficiently for information using documented and electronic sources of information.

17.		c7. Present and report his/her work correctly using appropriate writing rules and technologies media.
18.	D1	d1. Share successfully in team-work.
19.	D2	d2. Show respect to life and commit to community and patients serving.
20.	D3	d3. Communicate effectively with his/her colleagues, members of health care team and patients.
21.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
22.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam , Attendance
a3, a4	Lecture	Written exam , Attendance
a5	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b2	Lecture	Written exam , Attendance
b3	Lecture	Written exam , Attendance
b4, b5	Lecture	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 , c3 , c4 , c5	lecture, feed--back learning,	Written exam , Attendance Assignments ,
c6 , c7	feed--back learning , Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies

<b>Outcomes</b>		
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	Feed-back learning	Assignments

<b>IV. Course Content:</b>					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a4, a5, , d2	definition of hospital pharmacy, difference between community, clinical and hospital pharmacy, requirements of a pharmacist to practice hospital pharmacy, design of ideal hospital pharmacy	1	2
2	<b>Hospital pharmacists in the hospital</b>	a2, a5, d2	personnel organization of hospital pharmacists, duties and mission of hospital pharmacists, pharmacy-therapeutic committee (PTC), hospital formulary (H.F)	1	2
3	<b>Specific types of drug products in the hospital pharmacy</b>	a1, a5, b2, b5, c4, d2	(a) Emergenc <sup>4</sup> drugs : types , significance of each type, example of each type (including generic, trade name, dose, strength), storage and dispensing rules (b) Controlled drugs : types , significance of each type, example of each type (including generic, trade name, dose, strength), storage and dispensing rules (b) Operative and pre-operative medication: types , significance of each type, example of each type (including generic, trade name, dose, strength), storage and dispensing rules	2	4
4	<b>drug distribution systems to in-</b>	a5, c1, d2	comparison of advantages and disadvantages of floor (ward) stock system, individual prescription system,	2	4

	patients		combined system, unit dose system (procedures), patient's medications record; checking to avoid duplication and drug interactions		
MID-TERM EXAM				1	2
5	<b>Mixed I.V. preparations (1) I.V.admixtures:</b>	a5, b1, b3, b4, b5, c3, d2	definition, composition, advantages, incompatibilities. Chart of incompatibilities, measures to avoid incompatibilities, aseptic techniques of preparation	2	4
	<b>Mixed I.V. preparations (2) Total parenteral nutrition (TPN)</b>	a5, b1, b5, d2	definition, advantages, indications, properties (compatibility, sterility), Components :water (required daily amount) , energy sources (lipids, carbohydrates, proteins: required daily as Kcal), electrolytes and trace elements (types, daily required), vitamins (types, daily required)	2	4
6	<b>Out-patients oriented services</b>	a5, c3, d2	: dispensing of hospital prescriptions, types of hospital prescriptions (written, electronic), checking of prescription, checking of medications, checking of drug doses and interactions, using British national formulary(BNF) and other references, patient's counseling services.	1	2
7	<b>Pharmacy procurement (medical supply) and storage</b>	a5, c5, d2	<b>Medications to be supplied:</b> types, criteria of procurement (price, quality, availability, capacity and size , approval of PTC and review of H.F.). <b>Packaging and labeling</b> of drugs from large-capacity containers to smaller one. <b>Store of products:</b> arrangement and separation of products based on their properties ( physical states, toxicity, etc.)	1	2
	<b>Course Review</b>	a1, a2, a3, a1, b1, b2, b3, b4, b5, c1, c3, c4, c5, d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2

TOTAL	16	32
Number of Weeks /and Units Per Semester	16 weeks	7 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report	c6, c7, d5	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report	c6, c7, d1, d3, d5	14	4

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to search for incompatibilities of an iv mixed drug and to solve the problems provided by the teacher regarding dosing and preparation of IV admixtures and TPN.	B1, c6, c7, d5	4-13	6
2	<b>Group</b> : each group of students will be assigned to	c6, c7, d1, d3, d5	14	4

	prepare a booklet of hospital formulary concerning with emergency drugs, controlled drugs and operative drugs.			
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### VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a1, a2, a6, a3, a4, a5, b1, b2, b3, b1, b2, b6, b7, b8, b3, b3, b4, b5, d2
2	Assignments (1 + 2)	4, 14	10	10	b1, c6, c7, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2, b6, b7, b8, b3
4	Mid-semester exam of theoretical part (written exam)	7	20	20	a1, a2, a4, a5, b2, b5, c1, c4, d2
5	Final exam of theoretical part (written exam)	17	60	60	a1, a2, a3, a1, a2, a6, a3, a4, a5, b1, b2, b3, b1, b2, b6, b7, b8, b3, b3, b4, b5, d2
<b>TOTAL</b>			100	100 %	100

### VIII. Learning Resources:

#### 1- Required Textbook(s) ( maximum two ).

1. Martin Stephens. Hospital pharmacy. 2nd Edition, 2011, Pharmaceutical press.
2. Wasfi Abbas ElTayeb. Lecture notes in Hospital pharmacy, King Saud University

#### 2- Essential References.

1. Paradkar. Hospital and clinical pharmacy
2. Qadry. A text book of hospital pharmacy

3. Mark Jackson, Andrew Lowey. Handbook of extemporaneous preparation., 2010, The NHS Pharmaceutical Quality Assurance Committee, pharmaceutical press.

**3- Electronic Materials and Web Sites etc.**

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

**IX. Course Policies:**

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of HOSPITAL PHARMACY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
<p>The course is designed to provide the students with essential knowledge and skills necessary to offer hospital pharmaceutical services to in-patient and out-patients in health-care facilities. The course is an introduction to pharmacy training courses starting in the next semester.</p>

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A2	a1. Identify types of specific drug products in hospital pharmacy including extemporaneous preparation , mixed IV preparations and total parenteral nutrition (TPN).

2.		a2. Determine the components, advantages and disadvantages of hospital formulary (HF), IV-admixtures and TPN prepared in hospital pharmacy
3.	A3	a3. Explicit hospital pharmacy design, the systems of drug distribution , conditions of storage of drug products in hospitals, pharmacy procurement and the pharmaceutical care services offered by hospital pharmacists to patients in health care facilities.
4.		a4. Grasp knowledge and skills required to practice hospital pharmacy in health care facilities.
5.	A4	a5. Comprehend his/her role as a pharmacist Comprehend his/her role as a pharmacist in offering hospital pharmaceutical care services to in-patient and out-patient and his/her role as a member of the pharmacy & therapeutic committee.
6.	B1	b1. Solve problems related to reparation, storage, administration and dosing of IV admixtures, TPN and other preparations compounded by the pharmacist in hospital pharmacy.
7.	B2	b2 .Classify drug products in hospital pharmacy.
8.	B3	b3. Predict the reason of incompatibilities in IV-admixtures.
9.	B4	b4 . Assess the compatibility of IV-admixtures.
10.		b5. Select the most appropriate condition and place in the pharmacy to store drug products in hospital pharmacy.
11.	C2	c1. Distribute drugs in hospital to in-patients using standard optimal system.
12.		c2. Dispense drug products to out-patients using standard optimal system.
13.		c3. Avoid mixed IV preparations incompatibility and instability.
14.		c4. Arrange and store drug products correctly in hospital pharmacy .
15.		c5. Determine the type and quantity of drug products required to be purchased in hospital pharmacy.
16.	C4	c6 .Search efficiently for information using documented and electronic sources of information.
17.		c7. Present and report his/her works correctly using appropriate writing rules and technologies media.
18.	D1	d1. Share successfully in team-work.
19.	D2	d2. Show respect to life and commit to community and patients serving.
20.	D3	d3. Communicate effectively with his/her colleagues, members of health care team and patients.
21.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
22.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
a1, a2	Lecture	Written exam , Attendance
a3, a4	Lecture	Written exam , Attendance
a5	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
b1	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b2	Lecture	Written exam , Attendance
b3	Lecture	Written exam , Attendance
b4, b5	Lecture	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1 , c3, , c4 , c5	lecture, feed--back learning,	Written exam , Attendance Assignments ,
c6 , c7	feed--back learning , Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	Feed-back learning	Assignments

#### IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a4, a5, , d2	definition of hospital pharmacy, difference between community, clinical and hospital pharmacy, requirements of a pharmacist to practice hospital pharmacy, design of ideal hospital pharmacy	1	2
2	<b>Hospital pharmacists in the hospital</b>	a2, a5, d2	personnel organization of hospital pharmacists, duties and mission of hospital pharmacists, pharmacy-therapeutic committee (PTC), hospital	1	2

			formulary (H.F)		
3	<b>Specific types of drug products in the hospital pharmacy</b>	a1, a5, b2, b5, c4, d2	<p>(c) Emergenc<sup>4</sup> drugs : types , significance of each type, example of each type (including generic, trade name, dose, strength), storage and dispensing rules</p> <p>(d) Controlled drugs : types , significance of each type, example of each type (including generic, trade name, dose, strength), storage and dispensing rules</p> <p>(b) Operative and pre-operative medication: types , significance of each type, example of each type (including generic, trade name, dose, strength), storage and dispensing rules</p>	2	4
4	<b>drug distribution systems to in-patients</b>	a5, c1, d2	comparison of advantages and disadvantages of floor (ward) stock system, individual prescription system, combined system, unit dose system (procedures), patient`s medications record; checking to avoid duplication and drug interactions	2	4
<b>MID-TERM EXAM</b>				1	2
5	<b>Mixed I.V. preparations (1) I.V.admixtures:</b>	a5, b1, b3, b4, b5, c3 , d2	definition, composition, advantages, incompatibilities. Chart of incompatibilities, measures to avoid incompatibilities, aseptic techniques of preparation	2	4
	<b>Mixed I.V. preparations (2) Total parenteral nutrition (TPN)</b>	a5, b1, b5 , d2	definition, advantages, indications, properties (compatibility, sterility), Components :water (required daily amount) , energy sources (lipids, carbohydrates, proteins: required daily as Kcal), electrolytes and trace elements (types, daily required), vitamins (types, daily required)	2	4
6	<b>Out-patients oriented services</b>	a5, c3 , d2	: dispensing of hospital prescriptions, types of hospital prescriptions (written, electronic), checking of prescription, checking of medications, checking of drug	1	

			doses and interactions, using British national formulary(BNF) and other references, patient`s counseling services.		2
7	<b>Pharmacy procurement (medical supply) and storage</b>	a5, c5, d2	<b>Medications to be supplied:</b> types, criteria of procurement (price, quality, availability, capacity and size , approval of PTC and review of H.F.). <b>Packaging and labeling</b> of drugs from large-capacity containers to smaller one. <b>Store of products:</b> arrangement and separation of products based on their properties ( physical states, toxicity, etc.)	1	2
	<b>Course Review</b>	a1, a2, a3, a1, b1, b2, b3, b4, b5, c1, c3, c4, c5, d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student`s brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

VI. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to search for incompatibilities of an iv mixed drug and to solve the problems provided by the teacher regarding dosing and preparation of IV admixtures and TPN.	B1, c6, c7, d5	4-13	6
2	<b>Group :</b> each group of students will be assigned to prepare a booklet of hospital formulary concerning with emergenc4 drugs, controlled drugs and operative drugs.	c6, c7, d1, d3, d5	14	4

VII. Schedule of Assessment Tasks for Students During the Semester					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a1, a2, a6, a3, a4, a5, b1, b2, b3, b1, b2, b6, b7, b8, b3, b3, b4, b5, d2
2	Assignments (1 + 2)	4, 14	10	10	b1, c6, c7, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2, b6, b7, b8, b3

4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1,a2, a4, ,a5, b2, b5, c1, c4, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a1, a2, a6, a3, a4, a5, b1, b2, b3, b1, b2, b6, b7, b8, b3, b3, b4, b5, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Martin Stephens. Hospital pharmacy. 2nd Edition, 2011, Pharmaceutical press.
2. Wasfi Abbas ElTayeb. Lecture notes in Hospital pharmacy, King Saud University

### 2- Essential References.

1. Paradkar. Hospital and clinical pharmacy
2. Qadry. A text book of hospital pharmacy
3. Mark Jackson, Andrew Lowey. Handbook of extemporaneous preparation., 2010, The NHS Pharmaceutical Quality Assurance Committee, pharmaceutical press.

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.



4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PHYTOCHEMISTRY II

<b>I. Course Identification and General Information:</b>						
1.	Course Title:	PHYTOCHEMISTRY II				
2.	Course Code & Number:	PHRG 05				
3.	Credit hours:	C.H			TOTAL	
		Theoretical		P.		Tr.
		L.	Tut.			
		2	-	-		1
4.	Study level/ semester at which this course is offered:	( <i>FOURTH</i> ) Year – ( <i>1<sup>ST</sup></i> ) semester				
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General biology</li> <li>Botany</li> <li>General chemistry</li> <li>Organic chemistry</li> <li>Pharmaceutical organic chemistry</li> <li>Pharmacognosy I , II</li> <li>Phytochemistry I</li> </ul>				
6.	Co –requisite (if any):	none				
7.	Program (s) in which the course is offered:	All BC programs offered by the university				
8.	Language of teaching the course:	ENGLISH				
9.	Location of teaching the course:	IN THE UNIVERSITY				
10	Prepared By:					
11	Date of Approval	<b>10/2014</b>				

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course deals with the study of physicochemical properties, extraction, isolation and identification of active chemical constituents (phytochemicals) obtained from medicinal plants in particular phenyl propane derivatives, volatile oils, glycosides, tannins, steroid, and miscellaneous phytochemicals.

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A1	a1. Determine the botanical source and therapeutic uses of phenyl propane derivatives, volatile oils, glycosides, tannins, steroid, and miscellaneous phytochemicals.
2.	A2	a2. Determine the physicochemical properties of phenyl propane derivatives, volatile oils, glycosides, tannins, steroid, and miscellaneous phytochemicals.
3.	A3	a3. Discuss the methods and techniques used to extract and isolate phytochemicals
4.	A4	a4. Comprehend his/her role as a pharmacist in extraction, isolation and identification of phytochemicals.
5.	B1	b1. Express the chemical structure of phytochemicals using drawings.
6.	B2	b2. Differentiate between various types phenyl propane derivatives, volatile oils, glycosides, tannins, steroid, and miscellaneous phytochemicals.
7.		b3. Solve problems related to nomenclature, identification and differentiation of phytochemicals.
8.		b4 .Classify phenyl propane derivatives, volatile oils, glycosides, tannins, steroid, and miscellaneous phytochemicals. chemically and therapeutically
9.	B3	b5. Predict the outcomes of chemical reactions of alkaloids and terpenoids.
10.	B4	b6. Select the most appropriate technique for extraction and isolation of phytochemicals.
11.	C1	c1.Handle efficiently the tools and chemicals used in phytochemistry Lab.
12.		c2. Operate successfully the instruments used in phytochemistry Lab.
13.	C2	c3 . Perform effectively the experiments , practical tasks including extraction, identification and isolation of phytochemicals using standard procedures.
14.	C3	c4 .Take the required safety criteria during performing different types of

		practical and professional pharmacy works.
15.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
16.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	d1. Share successfully in team-work.
18.	D2	d2. Show respect to life.
19.	D3	d3. Communicate effectively with his/her colleagues.
20.	D4	d4. Behave in discipline during practicing practical and professional works and assignments.
21.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2	lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
a3	Lecture	Written exam , Attendance
a4	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture , feed-back learning laboratory practice	Written exam , Attendance, quizzes Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)

b3	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b4	Lecture	Written exam , Attendance
b5	Lecture , feed-back learning	Written exam , Attendance, assignment, quizzes
b6	Lecture	Written exam , Attendance

**(C) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice	Practical assessment (Lab. attendance, attitude, practical exam)
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice	Practical assessment (Lab. attendance, accomplishment, practical exam)
d5	Feed-back learning	Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Phenyl propane derivatives</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	<p>Introduction( definition, classification, biogenesis)</p> <p><b>Hydroxycinnamic acids</b> ( Definition, classification, biosynthesis, chemical structure, physic-chemical properties, extraction , pharmacological properties and uses</p> <p><b>Cinnamic aldehydes and monolignols</b> ( Definition, classification, biosynthesis, chemical structure, physic-chemical properties, extraction , pharmacological properties and uses</p> <p><b>Coumarins</b> ( Definition, classification, biosynthesis, chemical structure, physic-chemical properties, extraction , pharmacological properties and uses</p> <p><b>Stilbenoids</b> ( Definition, classification, biosynthesis, chemical structure, physic-chemical properties, extraction , pharmacological properties and uses</p>	3	6
2	<b>Volatile oils</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	<p>Definition, classification, distribution and occurrence; Extraction : distillation methods and solvent extraction ; Chemical , physical and pharmacological properties examples of crude drugs containing volatile oils</p>	3	6
Midterm exam				1	2
3	<b>Glycosides</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	<p>Introduction (definition, classification, distribution, extraction, isolation and pharmacological properties)</p> <p><b>Cardioactive glycosides</b> (cardenolides, bufadienolides, sugars, structure activity relationship, distribution, extraction, chemical and physical properties, hydrolysis of cardiac glycosides, biogenesis, pharmacological properties ,</p>	3	6

			<p>mechanism of action, chemical tests.                  Chief drugs containing cardiac glycosides (Digitalis, strophanthus, Adonis, Convalaria and squill).  <b>Saponin glycosides</b> (definition, classification, distribution, structures, biogenesis, chemical, physical properties, characterization, biological and pharmacological properties.                  Drugs as expectorant, antitusive, antiexudative, adaptogens and diuretic)  <b>Anthracen glycosides</b> (classification, distribution, structures, biosynthesis, extraction, chemical, physical properties, characterization, pharmacological properties, Senna, Rhabarub and Aloe)  <b>Flavonoid glycosides</b> (classification, biosynthesis, chemical structure, physico-chemical properties, rutin, hesperidin and flavonoid containing drugs)  <b>Cynogenic glycosides</b> (cynogenesis, distribution, structures, biogenesis, detection, extraction, pharmacological activities and cynogenetic drugs)  <b>Glucosinolates(Thioglycosides):</b>                  definition, distribution, structures, biogenesis, hydrolysis, toxicity and drugs containing glucosinolates.</p>		6
4	<b>Tannins</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	<p>definition, classification, structure, distribution, biosynthesis, physico-chemical properties, extraction, biological properties, examples of crude drugs containing tannins</p>	1	2
5	<b>Steroids</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	<p>Definition, classification, structures, biogenesis, chemical and physical properties and characterization.</p>	1	2
6	<b>Miscellaneous e.g. bitter principles</b>	a1, a2, a3, a4, b1, b2,	<p>Definition, classification, structures, biogenesis, chemical and physical properties and characterization.</p>	1	2

	b3, b4, b5, b6, d2			
<b>Course Review</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM			1	2
TOTAL			16	32
Number of Weeks /and Units Per Semester			16 weeks	6 Units



<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Intended Learning Outcomes CILOs</b>
physicochemical properties , extraction (maceration or percolation or soxhlet extraction ) , concentration (if necessary " rotary evaporation', isolation (Thin layer chromatography) and identification of the phytochemicals from crude drugs or parts of medicinal plants				
1.	Phenyl propane derivatives : ( cinnamic aldehyde)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
2.	Volatile oils (peppermint oil )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
3.	Volatile oils ( clove oil )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
4.	Saponins (Glycyrrhizin)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
5.	Flavonoids (Hesperetin)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
6.	Flavonoids (apigenin )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
7.	Anthracin Glycoside ( sennosides )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
8.	Cardiac Glycoside ( digoxin )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
9.	Tannins in Tea	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
10.	Miscellaneous: bitter principles ( Khellin)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
11.	Review	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.                  The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : each student will be assigned solve the problems provided by the teacher. The problems involve nomenclature, isolation , chemical reaction, etc.	b3, b5., c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to present 2-3 videos or simulations of one of the studied extraction , isolation techniques.	c5, c6, d1, d3, d5	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2
2	Assignments (1 + 2)	4, 14	5	5	b3, b5, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	3	3	b2, b3, b5
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a2, a3, a4 , b1, b6, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
6	Practical exam (practical)	14	20	20	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
Total			40	40 %	

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. W.C. Evans, Trease and Evans pharmacognosy, 2009, W.B.Saunders 2. Amritpal Singh Saroya, Herbalism, Phytochemistry and Ethnopharmacology, 2011, CRC press Jarald.
<b>2- Essential References.</b>
3. Bhandari. Textbook of pharmacognosy
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of PHYTOCHEMISTRY II

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with the study of physicochemical properties, extraction, isolation and identification of active chemical constituents (phytochemicals) obtained from medicinal plants in particular phenyl propane derivatives, volatile oils, glycosides, tannins, steroid, and miscellaneous phytochemicals.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 3. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Determine the botanical source and therapeutic uses of phenyl propane derivatives, volatile oils, glycosides, tannins, steroid, and miscellaneous phytochemicals.
2.	A2	a2. Determine the physicochemical properties of phenyl propane derivatives, volatile oils, glycosides, tannins, steroid, and miscellaneous phytochemicals.
3.	A3	a3. Discuss the methods and techniques used to extract and isolate phytochemicals
4.	A4	a4. Comprehend his/her role as a pharmacist in extraction, isolation and identification of phytochemicals.
5.	B1	b1. Express the chemical structure of phytochemicals using drawings.
6.	B2	b2. Differentiate between various types phenyl propane derivatives, volatile oils, glycosides, tannins, steroid, and miscellaneous phytochemicals.
7.		b3. Solve problems related to nomenclature, identification and differentiation of phytochemicals.
8.		b4 .Classify phenyl propane derivatives, volatile oils, glycosides, tannins, steroid, and miscellaneous phytochemicals. chemically and therapeutically
9.	B3	b5. Predict the outcomes of chemical reactions of alkaloids and terpenoids.
10.	B4	b6. Select the most appropriate technique for extraction and isolation of phytochemicals.
11.	C1	c1.Handle efficiently the tools and chemicals used in phytochemistry Lab.
12.		c2. Operate successfully the instruments used in phytochemistry Lab.
13.	C2	c3 . Perform effectively the experiments , practical tasks including extraction, identification and isolation of phytochemicals using standard procedures.
14.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.

15.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
16.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	d1. Share successfully in team-work.
18.	D2	d2. Show respect to life.
19.	D3	d3. Communicate effectively with his/her colleagues.
20.	D4	d4. Behave in discipline during practicing practical and professional works and assignments.
21.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

1. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2	lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
a3	Lecture	Written exam , Attendance
a4	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture , feed-back learning laboratory practice	Written exam , Attendance, quizzes Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)

b3	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b4	Lecture	Written exam , Attendance
b5	Lecture , feed-back learning	Written exam , Attendance, assignment, quizzes
b6	Lecture	Written exam , Attendance

**(C) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice	Practical assessment (Lab. attendance, attitude, practical exam)
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice	Practical assessment (Lab. attendance, accomplishment, practical exam)
d5	Feed-back learning	Assignments



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Phenyl propane derivatives</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	Introduction( definition, classification, biogenesis) <b>Hydroxycinnamic acids</b> ( Definition, classification, biosynthesis, chemical structure, physic-chemical properties, extraction , pharmacological properties and uses <b>Cinnamic aldehydes and monolignols</b> ( Definition, classification, biosynthesis, chemical structure, physic-chemical properties, extraction , pharmacological properties and uses <b>Coumarins</b> ( Definition, classification, biosynthesis, chemical structure, physic-chemical properties, extraction , pharmacological properties and uses <b>Stilbenoids</b> ( Definition, classification, biosynthesis, chemical structure, physic-chemical properties, extraction , pharmacological properties and uses	3	6
2	<b>Volatile oils</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	Definition, classification, distribution and occurrence; Extraction : distillation methods and solvent extraction ; Chemical , physical and pharmacological properties examples of crude drugs containing volatile oils	3	6
Midterm exam				1	2
3	<b>Glycosides</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	Introduction (definition, classification, distribution, extraction, isolation and pharmacological properties) <b>Cardioactive glycosides</b> (cardenolides, bufadienolides, sugars, structure activity relationship, distribution, extraction, chemical and physical properties, hydrolysis of cardiac glycosides,	3	6

			<p>biogenesis, pharmacological properties , mechanism of action, chemical tests.                  Chief drugs containing cardiac glycosides (Digitalis, strophanthus, Adonis, Convalaria and squill).  <b>Saponin glycosides</b> (definition, classification, distribution, structures,biogenesis,chemical , physical properties , characterization, biological and pharmacological properties.                  Drugs as expectorant ,antitusive, antiexudative, adaptogens and diuretic)  <b>Anthracen glycosides</b> (classification, distribution, structures, biosynthesis, extraction , chemical, physical properties, characterization, pharmacological properties, Senna, Rhabarub and Aloe)  <b>Flavonoid glycosides</b>( classification, biosynthesis, chemical structure, physic-chemical properties, rutin, hesperidin and flavonoid containing drugs)  <b>Cynogentic glycosides</b> (cynogenesis, distribution, structures, biogenesis, detection, extraction, pharmacological activities and cynogenetic drugs)  <b>Glucosinolates(Thioglycosides):</b> definition, distribution, structures, biogenesis , hydrolysis, toxicity and drugs containing glucosinolates.</p>		6
4	<b>Tannins</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	<p>definition, classification, structure, distribution, biosynthesis, physic-chemical properties, extraction, biological properties , examples of crude drugs containing tannins</p>	1	2
5	<b>Steroids</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	<p>Definition, classification, structures , biogenesis, chemical and physical properties and characterization.</p>	1	2
6	<b>Miscellaneous e.g. bitter</b>	a1, a2, a3, a4,	<p>Definition, classification, structures , biogenesis, chemical and physical</p>	1	2

	<b>principles</b>	b1, b2, b3, b4, b5, b6, d2	properties and characterization.		
	<b>Course Review</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Intended Learning Outcomes CILOs</b>
physicochemical properties , extraction (maceration or percolation or soxhlet extraction ) , concentration (if necessary " rotary evaporation", isolation (Thin layer chromatography) and identification of the phytochemicals from crude drugs or parts of medicinal plants				
1.	Phenyl propane derivatives : ( cinnamic aldehyde)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
2.	Volatile oils (peppermint oil )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
3.	Volatile oils ( clove oil )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
4.	Saponins (Glycyrrhizin)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
5.	Flavonoids (Hesperetin)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
6.	Flavonoids (apigenin )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
7.	Anthracin Glycoside ( sennosides )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
8.	Cardiac glycosides Glycoside ( Digoxin )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
9.	Tannins in Tea	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
10.	Miscellaneous: bitter principles ( Khellin)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
11.	Review	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.

The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : each student will be assigned solve the problems provided by the teacher. The problems involve nomenclature, isolation , chemical reaction, etc.	b3, b5., c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to present 2-3 videos or simulations of one of the studied extraction , isolation techniques.	c5, c6, d1, d3, d5	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2
2	Assignments (1 + 2)	4, 14	5	5	b3, b5, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	3	3	b2, b3, b5
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a2, a3, a4 , b1, b6, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
6	Practical exam (practical)	14	20	20	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
Total			40	40 %	

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
<ol style="list-style-type: none"> <li>1. W.C. Evans, Trease and Evans pharmacognosy, 2009, W.B.Saunders</li> <li>2. Amritpal Singh Saroya, Herbalism, Phytochemistry and Ethnopharmacology, 2011, CRC press Jarald.</li> </ol>
<b>2- Essential References.</b>
<ol style="list-style-type: none"> <li>1. Bhandari. Textbook of pharmacognosy</li> </ol>
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## PHARMACY TRAINING I

I. Course Identification and General Information:							
1.	Course Title:	PHARMACY TRAINING I					
2.	Course Code & Number:	PHRT 15					
3.	Credit hours:	C.H			P.	Tr.	TOTAL
		Theoretical					
		L.	Tut.	S.			
		-	-	-	-	2	2
2 credit hours equivalent to 250 contact hours							
4.	Study level/ semester at which this course is offered:	( FOURTH ) Year – ( 2 <sup>ND</sup> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>• Pharmaceutics I, II &amp; III</li> <li>• Clinical pharmacy I &amp; II</li> <li>• Integrated-case based learning I &amp; II</li> <li>• Pharmacotherapy I &amp; II</li> <li>• Pharmacology I &amp; II &amp; III</li> </ul>					
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>• Industrial pharmacy</li> <li>• Hospital pharmacy</li> <li>• Pharmaceutical quality control</li> </ul>					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	10/2014					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

## II. Course Description:

This is a field training course designed to allow students to apply their knowledge and skills in the real world. The course concerns with training in drug plants to practice industrial pharmacy , pharmaceutics and pharmaceutical quality control and in hospitals to practice hospital and clinical pharmacy.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	C1	c1.Handle efficiently the tools and chemicals used in drug plants and hospital pharmacies.
2.		c2. Operate successfully the instruments used in drug plants and hospital pharmacies.
3.	C2	c3 . Perform effectively the pharmacy-professional tasks in drug plants and hospital pharmacies using standard procedures.
4.		c4. Apply rules of dispensing, drug distribution , patient consultation and other hospital-pharmacy related tasks.
5.		c5. Share in medical rotation and participate in designing therapeutic regimen and therapy monitoring for inpatients in the hospitals.
6.	C3	c6 .Take the required safety criteria during performing different professional works in dug plans and hospital pharmacies.
7.	C4	c7. Present and report his/her works correctly using appropriate writing rules and technologies media.
8.	D1	d1. Share successfully in team-work.
9.	D2	d2. Show respect to life and commit to community and patients serving.
10.	D3	d3. Communicate effectively with his/her colleagues, members of health care team, patients and community
11.	D4	d4.Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
12.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4 , c5, c6	Field training	Field training assessment
c7	Field training	Field training assessment

**(b) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Field training , Group-projects	Field training assessment
d2	Field training	Field training assessment
d5	Field training	Field training assessment

#### IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Training in drug plants</b>	c1, c2, c3, c4, c5, c6, c7, d1, d2, d3, d4, d5	<p><b>In a local drug plant:</b>            Students are intended to practice in a local pharmaceutical company to accomplish the following tasks :-</p> <ul style="list-style-type: none"> <li>• Quality control               <ul style="list-style-type: none"> <li>○ Sampling and analysis of raw materials</li> <li>○ Sampling and analysis of pharmaceutical dosage forms.</li> <li>○ Sampling and for Microbiological analysis</li> </ul> </li> <li>• Manufacturing unit-operation process of pharmaceutical dosage forms               <ul style="list-style-type: none"> <li>○ Solid dosage forms</li> <li>○ Liquid dosage forms</li> <li>○ Semisolid dosage forms</li> </ul> </li> <li>• Pharmaceutical research and development.               <ul style="list-style-type: none"> <li>○ Master file</li> <li>○ Similar Products investigation</li> <li>○ Formulation steps</li> <li>○ Stability studies</li> </ul> </li> </ul>	1 - 7th week	100
2	<b>Training in Hospital pharmacies and performing clinical tasks</b>	c1, c2, c3, c4, c5, c6, c7, d1, d2, d3, d4, d5	<p><b>In a local hospital or healthcare facility</b>  <b><u>Hospital pharmacy tasks</u></b></p> <ul style="list-style-type: none"> <li>• Practice Extemporaneous preparations</li> <li>• Preparation of IV-admixtures</li> <li>• Sharing in pharmacy-therapeutic committee and hospital formulary</li> <li>• Distribute drugs to in-patients</li> <li>• Dispense drugs to in-patients and out-patients</li> <li>• Arrangement of hospital specific drug products:</li> </ul>	8th week – 16 th week	150

			<p>operations and preoperative drug products, emergency drug products</p> <ul style="list-style-type: none"> <li>• Documenting and performing Medical supply to hospital pharmacy</li> </ul> <p><b><u>Clinical tasks</u></b></p> <ul style="list-style-type: none"> <li>• Checking of patients medication records</li> <li>• Sharing in morning medical rotation and session of health care team</li> <li>• Design therapeutic regimen to patients &amp; present his design to the health care team</li> <li>• Study of patient`s medical record including medication order and chart of administration &amp; Monitoring drug therapy applied to in-Patients</li> </ul>		
FINAL - EXAM				1	2
TOTAL				16	250 contact hours equivalent to 2 credit hours
Number of Weeks /and Units Per Semester				16 weeks	2 Units

## V. Teaching strategies of the course:

**Field training:** each 2-3 students are commissioned to do certain assignments in a real field entity such as drug factory, hospitals, pharmacies under supervision of both the field principle and an academic supervisor

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual :</b> each student is assigned to perform the tasks provided in the training program	c1, c2, c3, c4, c5, c6, c7	1- 14 th week	14
2	<b>Group:</b> the group will be assigned to participate in certain tasks such as medical rotation, production of drug products	c5, d1, d3	1- 14 th week	6

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance ( by the supervisor)		10	10 %	c1, c2, c3, c4, c5, c6, c7
2	Attitude (by the supervisor)		10	10 %	d2, d4, d5
3	Reporting (by the supervisor)		10	10 %	c7
4	Training assignments accomplishment (by the supervisor)		20	20 %	c1, c2, c3, c4, c5, c6, c7
5	Final Committee exam * : Oral exam		50	50 %	c1, c2, c3, c4, c5, c6, c7
<b>TOTAL</b>			100	100 %	

\* : A committee of three of the teaching staff including the supervisor of the training.

The marks of the committee exam is divided as follows:

Item	Mark
supervisor	10
Committee member 1	20
Committee member 1	20

### General Rule

- The student should provide a signed letter form the health care facility and another form the local drug plant where he has practiced. The letters shall confirm the student`s appropriate attendance, behavior and number hours of practice. No student will be allowed to enter the final exam without such letters.

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Karen J. Tietze. Clinical skills for pharmacists : A Patient-Focused Approach, 2012, Elsevier Inc. 2. Lachman, Theory and Practice of Industrial Pharmacy
<b>2- Essential References.</b>
1. Paradkar. Hospital and clinical pharmacy
<b>3- Electronic Materials and Web Sites etc.</b>
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5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of PHARMACY TRAINING I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
<p>This is a field training course designed to allow students to apply their knowledge and skills in the real world. The course concerns with training drug plants to practice industrial pharmacy , pharmaceutics and pharmaceutical quality control and in hospitals to practice hospital and clinical pharmacy.</p>



<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>3. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	<b>C1</b>	<b>c1.</b> Handle efficiently the tools and chemicals used in drug plants and hospital pharmacies.
2.		<b>c2.</b> Operate successfully the instruments used in drug plants and hospital pharmacies.
3.	<b>C2</b>	<b>c3 .</b> Perform effectively the pharmacy-professional tasks in drug plants and hospital pharmacies using standard procedures.
4.		<b>c4.</b> Apply rules of dispensing, drug distribution , patient consultation and other hospital-pharmacy related tasks.
5.		<b>c5.</b> Share in medical rotation and participate in designing therapeutic regimen and therapy monitoring for inpatients in the hospitals.
6.	<b>C3</b>	<b>c6 .</b> Take the required safety criteria during performing different professional works in dug plans and hospital pharmacies.
7.	<b>C4</b>	<b>c7.</b> Present and report his/her works correctly using appropriate writing rules and technologies media.
8.	<b>D1</b>	<b>d1.</b> Share successfully in team-work.
9.	<b>D2</b>	<b>d2.</b> Show respect to life and commit to community and patients serving.
10.	<b>D3</b>	<b>d3.</b> Communicate effectively with his/her colleagues, members of health care team, patients and community
11.	<b>D4</b>	<b>d4.</b> Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
12.	<b>D5</b>	<b>d5.</b> Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>4. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>c1, c2, c3, c4 , c5, c6</b>	<b>Field training</b>	<b>Field training assessment</b>
<b>c7</b>	<b>Field training</b>	<b>Field training assessment</b>
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1, d3, d4</b>	<b>Field training , Group-projects</b>	<b>Field training assessment</b>
<b>d2</b>	<b>Field training</b>	<b>Field training assessment</b>
<b>d5</b>	<b>Field training</b>	<b>Field training assessment</b>

## V. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Training in drug plants</b>	c1, c2, c3, c4, c5, c6, c7, d1, d2, d3, d4, d5	<p><b>In a local drug plant:</b>            Students are intended to practice in a local pharmaceutical company to accomplish the following tasks :-</p> <ul style="list-style-type: none"> <li>• Quality control               <ul style="list-style-type: none"> <li>○ Sampling and analysis of raw materials</li> <li>○ Sampling and analysis of pharmaceutical dosage forms.</li> <li>○ Sampling and for Microbiological analysis</li> </ul> </li> <li>• Manufacturing unit-operation process of pharmaceutical dosage forms               <ul style="list-style-type: none"> <li>○ Solid dosage forms</li> <li>○ Liquid dosage forms</li> <li>○ Semisolid dosage forms</li> </ul> </li> <li>• Pharmaceutical research and development.               <ul style="list-style-type: none"> <li>○ Master file</li> <li>○ Similar Products investigation</li> <li>○ Formulation steps</li> <li>○ Stability studies</li> </ul> </li> </ul>	1 - 7th week	100
2	<b>Training in Hospital pharmacies and performing clinical tasks</b>	c1, c2, c3, c4, c5, c6, c7, d1, d2, d3, d4, d5	<p><b>In a local hospital or healthcare facility</b>  <b><u>Hospital pharmacy tasks</u></b></p> <ul style="list-style-type: none"> <li>• Practice Extemporaneous preparations</li> <li>• Preparation of IV-admixtures</li> <li>• Sharing in pharmacy-therapeutic committee and hospital formulary</li> <li>• Distribute drugs to in-patients</li> <li>• Dispense drugs to in-patients and out-patients</li> <li>• Arrangement of hospital specific drug products:</li> </ul>	8th week – 16 th week	150

			<p>operations and preoperative drug products, emergency drug products</p> <ul style="list-style-type: none"> <li>• Documenting and performing Medical supply to hospital pharmacy</li> </ul> <p><b><u>Clinical tasks</u></b></p> <ul style="list-style-type: none"> <li>• Checking of patients medication records</li> <li>• Sharing in morning medical rotation and session of health care team</li> <li>• Design therapeutic regimen to patients &amp; present his design to the health care team</li> <li>• Study of patient`s medical record including medication order and chart of administration &amp; Monitoring drug therapy applied to in-Patients</li> </ul>		
FINAL - EXAM				1	2
TOTAL				16	250 contact hours equivalent to 2 credit hours
Number of Weeks /and Units Per Semester				16 weeks	2 Units

## VI. Teaching strategies of the course:

**Field training:** each 2-3 students are commissioned to do certain assignments in a real field entity such as drug factory, hospitals, pharmacies under supervision of both the field principle and an academic supervisor

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual :</b> each student is assigned to perform the tasks provided in the training program	c1, c2, c3, c4, c5, c6, c7	1- 14 th week	14
2	<b>Group:</b> the group will be assigned to participate in certain tasks such as medical rotation, production of drug products	c5, d1, d3	1- 14 th week	6

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
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3	Reporting (by the supervisor)		10	10 %	c7
4	Training assignments accomplishment (by the supervisor)		20	20 %	c1, c2, c3, c4, c5, c6, c7
5	Final Committee exam * : Oral exam		50	50 %	c1, c2, c3, c4, c5, c6, c7
TOTAL			100	100 %	

\* : A committee of three of the teaching staff including the supervisor of the training.

The marks of the committee exam is divided as follows:

Item	Mark
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<b>2- Essential References.</b>
2. Paradkar. Hospital and clinical pharmacy
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

Medical sciences college  
 Department: Pharmacy  
 Title of the Program: PHARMACY BACHELOR

## Course Specification

### COMPLEMENTARY & ALTERNATIVE MEDICINE

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	COMPLEMENTARY & ALTERNATIVE MEDICINE					
2.	Course Code & Number:	PHRG 06					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( <i>FOURTH</i> ) Year – ( <i>2ND</i> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>Introduction to pharmacy profession</li> <li>Physics</li> <li>Pharmacognosy I &amp; II</li> <li>Phytochemistry I &amp; II</li> <li>Pharmacology I &amp; II &amp; III</li> <li>Pharmacotherapy I &amp; II</li> </ul>					
6.	Co –requisite (if any):	NONE					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of non-classical methods of therapy such as medicines-based traditional medicine including phytotherapy and non-medicines based therapies that can be used as alternative and/or complementary to classical pharmacotherapy..



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the diseases/ disorders of the body which can be treated by non-classical therapeutic methods
2.	A2	a2. Explain the biological effects of non-classical therapeutic methods on body systems.
3.	A3	a3. Discuss the principles and techniques applied as alternative and complementary therapies.
4.		a4. Recognize the concepts of traditional medicine, integrated medicine & Pharmacovigilance in complementary and alternative medicine.
5.	A2	a5. Comprehend his/her role as a pharmacist in employing and assessing benefits and risks of complementary and alternative medicine
6.	B2	b1 .Classify different techniques applied in complementary and alternative medicine
7.		b2. Compare different techniques applied in complementary and alternative medicine based on benefits and risks.
8.	B3	b3. Predict the adverse effects of techniques applied in complementary and alternative medicine
9.	B4	b4 . Assess the benefit/risks of techniques applied in complementary and alternative medicine
10.		b5. Select an appropriate non-classical therapeutic method for patients.
11.	C2	c1. Provide correct information on techniques applied in complementary and alternative medicine to patients and physicians.
12.	C4	c2 .Search efficiently for information using documented and electronic sources of information.
13.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
14.	D1	d1. Share successfully in team-work.
15.	D2	d2. Show respect to life and commit to community and patients serving.
16.	D4	d3. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
17.	D5	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>a1, a2, a3, a4, a5</b>	<b>Lecture</b>	<b>Written exam , Attendance</b>
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>b1, b2 , b3 , b4, b5</b>	<b>Lecture, feed-back learning</b>	<b>Written exam , Attendance , quizzes , assignments</b>
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>c1</b>	<b>Lecture</b>	<b>Written exam , Attendance</b>
<b>c2 , c3</b>	<b>feed-back learning, Group-project</b>	<b>Assignments</b>
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1, d3</b>	<b>Feed-back learning</b>	<b>Assignments</b>
<b>d2</b>	<b>Lecture</b>	<b>Written exam , Attendance</b>
<b>d4</b>	<b>Feed-back learning</b>	<b>Assignments</b>

## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a2, a3, a4, a5, b1, b2, d2	<ul style="list-style-type: none"> <li><input type="checkbox"/> The complementary and alternative concept of healthcare</li> <li><input type="checkbox"/> Comparison with classical methods of therapy (Benefits/risk ; evidence/non-evidence based)</li> <li><input type="checkbox"/> The evidence base for complementary and alternative medicine</li> <li><input type="checkbox"/> Integrative medicine – incorporating complementary and alternative medicine into practice</li> <li><input type="checkbox"/> Delivering complementary and Complementary and alternative medicine</li> <li><input type="checkbox"/> Pharmacovigilance of complementary medicines</li> <li><input type="checkbox"/> Classification of methods of complementary and alternative medicine : medicinal-based , non-medicinal based , traditional medicine , evidence-based therapies</li> </ul>	2	4
2	<b>Non-classical Medicinal-based therapies Part I : Traditional medicine</b>	a1, a2, a3, a4, a5, c1, d2	<ul style="list-style-type: none"> <li><input type="checkbox"/> The traditional healthcare environment and references</li> <li><input type="checkbox"/></li> <li><input type="checkbox"/> Concepts , principles and applications of                             <ul style="list-style-type: none"> <li>• Traditional Chinese medicine</li> <li>• Indian Ayurveda medicine</li> <li>• Traditional medicine in Yemen</li> </ul> </li> </ul>	2	4
3	<b>Non-classical Medicinal-based Part II: evidence-based therapies</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2	<p>Principles , applications , benefit/risks of :</p> <ol style="list-style-type: none"> <li>1- Homeopathy and anthroposophy</li> <li>2- Aromatherapy</li> <li>3- Flower remedy therapy</li> <li>4- Herbal medicine (<b>Phytotherapy</b>) : introduction</li> </ol>	2	4

<ul style="list-style-type: none"> <li>• MID-TERM EXAM</li> <li>• Post-exam discussion</li> </ul>				1	2
4	<b>Products of phytotherapy (Herbal medicine)</b>	a1, a2, a5, b3, b4, b5, c1, d2	<p>☐ <b>Topical products</b> : demulcents, antiinflammatories, antiseptic disinfectants, treatment of burn and wounds.</p> <p>☐ <b>Oral products</b> : recommended herbals or herbal combinations , their doses and preparations for treatment of</p> <ul style="list-style-type: none"> <li>• Respiratory diseases (common cold, asthma, cough)</li> <li>• GIT disorders (diarrhea, constipation, peptic ulcer, intestinal colic)</li> <li>• Renal disorders: stones, renal colic</li> <li>• CVS disorders: hypertension, angina</li> <li>• Endocrinology disorders: diabetes mellitus</li> <li>• Pain and inflammation</li> <li>• Hepatic dysfunction</li> <li>• Bacterial infections</li> <li>• Fungal infections</li> <li>• Parasital infections: malaria, helminthes</li> <li>• Erectile dysfunction</li> <li>• Amenorrhea</li> <li>• Infertility</li> <li>• Mental disorders: depression and psychosis</li> </ul>	3	6
5	<b>Non-classical medicinal Therapies non-based</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2	<p>Principles , applications , benefit/risks of :</p> <p>☐ Naturopathy and its associated methods</p> <p>☐ Hydrotherapy</p> <p>☐ Diagnostic therapies</p> <p>☐ Manual therapies</p> <p>☐ Mind and body therapies including physiotherapy</p> <p>☐ Other therapies : e.g. electrotherapy</p>	3	6

<b>Course Review</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM			1	2
TOTAL			16	32
<b>Number of Weeks /and Units Per Semester</b>			16 weeks	5 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
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1	<b>Individual:</b> every student is assigned to do a search-report on benefit/risks of one non-classical therapy studied in this course	b2, b4, c2, c3, d4	4-13	6
2	<b>Group :</b> each group of students will be assigned to do compare the benefit/risks of a groups of one non-classical therapy in comparison to classical drug therapy.	b2, b4, c2, c3, d1, ,d3, d4	14	4

### VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2
2	Assignments (1 + 2)	4, 14	10	10	b2, b4, c2, c3, d1, ,d3, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b4, b5
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Steven B Kayne. Complementary and alternative medicine, 2009, Pharmaceutical press.
2. Karin Kraft. Pocket guide to herbal medicine, 2004 Georg Thieme Verlag

### 2- Essential References.

1. Joshi. Essentials of orthopaedics and applied physiotherapy
2. Sanjay Pandya. Practical Guidelines on Fluid Therapy
3. Basanta kumar Nanda. Electrotherapy simplified

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
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**Al-RaziUniversity**  
**Medical sciences college**  
 Department: pharmacy  
 Title of the Program: PHARMACY BACHELOR

**Course Plan (Syllabus) of**

**COMPLEMENTARY & ALTERNATIVE MEDICINE**

<b>I. - Information about Faculty Member Responsible for the Course:</b>							
<b>Name of Faculty Member</b>		<b>Office Hours</b>					
<b>Location &amp; Telephone No.</b>	Pharmacy department	<b>SAT</b>	<b>SUN</b>	<b>MON</b>	<b>TUE</b>	<b>WED</b>	<b>THU</b>
<b>E-mail</b>							

<b>II. Course Description:</b>
The course deals with the study of non-classical methods of therapy such as medicines-based traditional medicine including phytotherapy and non-medicines based therapies that can be used as alternative and/or complementary to classical pharmacotherapy..



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the diseases/ disorders of the body which can be treated by non-classical therapeutic methods
2.	A2	a2. Explain the biological effects of non-classical therapeutic methods on body systems.
3.	A3	a3. Discuss the principles and techniques applied as alternative and complementary therapies.
4.		a4. Recognize the concepts of traditional medicine, integrated medicine & Pharmacovigilance in complementary and alternative medicine.
5.	A2	a5. Comprehend his/her role as a pharmacist in employing and assessing benefits and risks of complementary and alternative medicine
6.	B2	b1 .Classify different techniques applied in complementary and alternative medicine
7.		b2. Compare different techniques applied in complementary and alternative medicine based on benefits and risks.
8.	B3	b3. Predict the adverse effects of techniques applied in complementary and alternative medicine
9.	B4	b4 . Assess the benefit/risks of techniques applied in complementary and alternative medicine
10.		b5. Select an appropriate non-classical therapeutic method for patients.
11.	C2	c1. Provide correct information on techniques applied in complementary and alternative medicine to patients and physicians.
12.	C4	c2 .Search efficiently for information using documented and electronic sources of information.
13.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
14.	D1	d1. Share successfully in team-work.
15.	D2	d2. Show respect to life and commit to community and patients serving.
16.	D4	d3. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
17.	D5	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>a1, a2, a3, a4, a5</b>	<b>Lecture</b>	<b>Written exam , Attendance</b>
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>b1, b2 , b3 , b4, b5</b>	<b>Lecture, feed-back learning</b>	<b>Written exam , Attendance , quizzes , assignments</b>
<b>(c)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>c1</b>	<b>Lecture</b>	<b>Written exam , Attendance</b>
<b>c2 , c3</b>	<b>feed-back learning, Group-project</b>	<b>Assignments</b>
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1, d3</b>	<b>Feed-back learning</b>	<b>Assignments</b>
<b>d2</b>	<b>Lecture</b>	<b>Written exam , Attendance</b>
<b>d4</b>	<b>Feed-back learning</b>	<b>Assignments</b>

IV. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a2, a3, a4, a5, b1, b2, d2	<input type="checkbox"/> The complementary and alternative concept of healthcare <input type="checkbox"/> Comparison with classical methods of therapy (Benefits/risk ; evidence/non-evidence based) <input type="checkbox"/> The evidence base for complementary and alternative medicine <input type="checkbox"/> Integrative medicine – incorporating complementary and alternative medicine into practice <input type="checkbox"/> Delivering complementary and Complementary and alternative medicine <input type="checkbox"/> Pharmacovigilance of complementary medicines <input type="checkbox"/> Classification of methods of complementary and alternative medicine : medicinal-based , non-medicinal based , traditional medicine , evidence-based therapies	2	4
2	<b>Non-classical Medicinal-based therapies Part I : Traditional medicine</b>	a1, a2, a3, a4, a5, c1, d2	<input type="checkbox"/> The traditional healthcare environment and references <input type="checkbox"/> Concepts , principles and applications of <ul style="list-style-type: none"> <li>• Traditional Chinese medicine</li> <li>• Indian Ayurveda medicine</li> <li>• Traditional medicine in Yemen</li> </ul>	2	4
3	<b>Non-classical Medicinal-based Part II: evidence-based therapies</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2	Principles , applications , benefit/risks of : 5- Homeopathy and anthroposophy 6- Aromatherapy 7- Flower remedy therapy 8- Herbal medicine <b>(Phytotherapy) : introduction</b>	2	4

<ul style="list-style-type: none"> <li>• MID-TERM EXAM</li> <li>• Post-exam discussion</li> </ul>				1	2
4	<b>Products of phytotherapy (Herbal medicine)</b>	a1, a2, a5, b3, b4, b5, c1, d2	<input type="checkbox"/> <b>Topical products</b> : demulcents, antiinflammatories, antiseptic disinfectants, treatment of burn and wounds. <input type="checkbox"/> <b>Oral products</b> : recommended herbals or herbal combinations , their doses and preparations for treatment of <ul style="list-style-type: none"> <li>• Respiratory diseases (common cold, asthma, cough)</li> <li>• GIT disorders (diarrhea, constipation, peptic ulcer, intestinal colic)</li> <li>• Renal disorders: stones, renal colic</li> <li>• CVS disorders: hypertension, angina</li> <li>• Endocrinology disorders: diabetes mellitus</li> <li>• Pain and inflammation</li> <li>• Hepatic dysfunction</li> <li>• Bacterial infections</li> <li>• Fungal infections</li> <li>• Parasital infections: malaria, helminthes</li> <li>• Erectile dysfunction</li> <li>• Amenorrhea</li> <li>• Infertility</li> <li>• Mental disorders: depression and psychosis</li> </ul>	3	6
5	<b>Non-classical medicinal Therapies non-based</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2	Principles , applications , benefit/risks of : <ul style="list-style-type: none"> <li><input type="checkbox"/> Naturopathy and its associated methods</li> <li><input type="checkbox"/> Hydrotherapy</li> <li><input type="checkbox"/> Diagnostic therapies</li> <li><input type="checkbox"/> Manual therapies</li> <li><input type="checkbox"/> Mind and body therapies including physiotherapy</li> <li><input type="checkbox"/> Other therapies : e.g. electrotherapy</li> </ul>	3	6

<b>Course Review</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM			1	2
TOTAL			16	32
<b>Number of Weeks /and Units Per Semester</b>			16 weeks	5 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

VI. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to do a search-report on benefit/risks of one non-classical therapy studied in this course	b2, b4, c2, c3, d4	4-13	6
2	<b>Group :</b> each group of students will be assigned to do compare the benefit/risks of a groups of one non-classical therapy in comparison to classical drug therapy.	b2, b4, c2, c3, d1, ,d3, d4	14	4

VIII. Schedule of Assessment Tasks for Students During the Semester					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2
2	Assignments (1 + 2)	4, 14	10	10	b2, b4, c2, c3, d1, ,d3, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b4, b5
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Steven B Kayne. Complementary and alternative medicine, 2009, Pharmaceutical press.
2. Karin Kraft. Pocket guide to herbal medicine, 2004 Georg Thieme Verlag

### 2- Essential References.

1. Joshi. Essentials of orthopaedics and applied physiotherapy
2. Sanjay Pandya. Practical Guidelines on Fluid Therapy
3. Basanta kumar Nanda. Electrotherapy simplified

### 3- Electronic Materials and Web Sites etc.

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## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
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4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### TOXICOLOGY

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	TOXICOLOGY					
2.	Course Code & Number:	PHRC 09					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( <i>FOURTH</i> ) Year – ( <i>2<sup>ND</sup></i> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General chemistry</li> <li>Analytical chemistry</li> <li>Pathology</li> <li>Pharmacology I, II &amp; III</li> <li>Experimental pharmacology</li> </ul>					
6.	Co –requisite (if any):	none					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of general principles of toxicity due to chemicals or medicinal agents. The course focuses on sources, mechanism of action , effects on body organs, detection, diagnosis and management of poisoning .



<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A1	a1. Identify the toxic pathophysiological effect of poisons on human body organs.
2.	A2	a2. Identify the common chemicals that are poisonous to human.
3.		a3. Determine the mode of action of poisons.
4.		a4. Discuss the approaches of poisons detection, diagnosis and elimination and the procedures of poisoning management.
5.	A4	a5. Comprehend his/her role as a pharmacist in detection, preventing and management of poisoning.
6.	B2	b1. Classify poisons that can harm human, animals and plants.
7.		b2. Compare between different poisons based on their harmful effects sources & management.
8.		b3. Relate the procedure of poisoning management to the type of poisons,
9.	B3	b4. Predict the harmful effects of poisons on body organs.
10.	B4	b5. Assess the degree of poisoning based on diagnostic data.
11.		b6. Select the most appropriate procedure to manage a poisoning.
12.	C2	c1. Manage and limit effectively the harmful effects of poisoning.
13.	C4	c2. Search efficiently for information using documented and electronic sources of information.
14.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
15.	D1	d1. Share successfully in team-work.
16.	D2	d2. Show respect to life and commit to community and patients serving.
17.	D3	d3. Communicate effectively with his/her colleagues.
18.	D5	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3, a4 , a5	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3, b4	Lecture, feed-back learning	Written exam , Attendance, assignments
b5, b6	Lecture , feed-back learning	Written exam , Attendance, assignment, quizzes

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	Lecture , feed-back learning	Written exam , Attendance, assignment, quizzes
c2 , c3	feed-back learning, Group-project	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d4	Feed-back learning	Assignments

IV. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>General Toxicology</b>	a1, a2, a3, a4, a5, b1, d2	<ul style="list-style-type: none"> <li>• Definitions</li> <li>• fundamentals and scope of toxicology.</li> <li>• Classification of poisons</li> <li>• Causes of toxicity : accidental, commit suicidal, criminal</li> <li>• General harmful effects of poisons</li> <li>• Approaches to manage poisoning</li> <li>• Mode of actions of poisons</li> <li>• Diagnosis and detection of poisoning</li> <li>• General procedure of management of poisoning</li> </ul>	2	4
sources, mode of action, toxic pathophysiological effects, detection, diagnosis and management of the following types of toxicity					
2	<b>Toxicity caused by acids and alkalis</b>	b2, b3, b4, b5, b6, c1, d2	<ul style="list-style-type: none"> <li>• Acids toxicity</li> <li>• Alkalis toxicity</li> <li>• Salts toxicity</li> </ul>	1	2
3	<b>Toxicity caused by metals and metalloids</b>	b2, b3, b4, b5, b6, c1, d2	<ul style="list-style-type: none"> <li>• Toxicity of copper, selenium, Molybdenum, phosphorus</li> <li>• Iron toxicity</li> </ul>	2	4
4	<b>Toxicity due to heavy metals</b>	b2, b3, b4, b5, b6, c1, d2	Toxicity of Lead, Mercury and Arsenic	2	4
MID-TERM EXAM				1	2
5	<b>Toxicity due to specific chemicals</b>	b2, b3, b4, b5, b6, c1, d2	<ul style="list-style-type: none"> <li>• Toxicity of Cyanide</li> <li>• Toxicity of Hydrogen sulfide</li> <li>• Carbon monoxide</li> </ul>	2	4
6	<b>Toxicity due to simple organic</b>	b2, b3, b4, b5, b6, c1, d2	<ul style="list-style-type: none"> <li>• Toxicity of Methanol and Isopropyl Alcohols</li> <li>• Toxicity of hydrocarbons</li> </ul>	2	4

	<b>compounds</b>		<ul style="list-style-type: none"> <li>Toxicity due to fuel materials : petroleum , gasoline, etc</li> </ul>		
7	<b>Toxicity due to poisons killing harmful Living organisms</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b6, c1, d2	<ul style="list-style-type: none"> <li>Toxicity of Rodenticides,</li> <li>Toxicity of insecticides</li> <li>Toxicity of Pesticides and Herbicides.</li> <li>Toxicity of Fungicides</li> </ul>	2	4
	<b>Course Review</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b6, c1, d2	b2	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

VI. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to provide a search-based report on toxicity and management of one poison not included in the study topics.	c2, c3, d4	4-13	6
2	<b>Group :</b> each group of students will be assigned to provide a search-based report supported with illustrating videos on poisonous drugs such as narcotics analgesics , nicotine, khat , overdosing of drugs,	c2, c3, d1, d3, d4	14	4

VII. Schedule of Assessment Tasks for Students During the Semester					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b6, c1, d2
2	Assignments (1 + 2)	4, 14	10	10	c2, c3, d1, d3, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b3, b4
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b6, c1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b6, c1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

#### REFERENCES

1. kokate, text book of forensic pharmacy
2. Peter Viccellio, Handbook of Medical Toxicology

### 2- Essential References.

1. Casarett & Doull's , Essentials of Toxicology
2. Frank A. Barile, Principles of toxicology Testing R.S. Gaud G.T. Gupta practical physical

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of TOXICOLOGY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	Pr.Dr. Rashad Alnamer	Office Hours					
Location & Telephone No.	Pharmacy department 774871511	SAT	SUN	MON	TUE	WED	THU
E-mail	yemtiger1@yahoo.com						

### II. Course Description:

The course deals with the study of general principles of toxicity due to chemicals or medicinal agents. The course focuses on sources, mechanism of action, effects on body organs, detection, diagnosis and management of poisoning.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A1	a1. Identify the toxic pathophysiological effect of poisons on human body organs.
2.	A2	a2. Identify the common chemicals that are poisonous to human.
3.		a3. Determine the mode of action of poisons.
4.		a4. Discuss the approaches of poisons detection, diagnosis and elimination and the procedures of poisoning management.
5.	A4	a5. Comprehend his/her role as a pharmacist in detection, preventing and management of poisoning.
6.	B2	b1. Classify poisons that can harm human, animals and plants.
7.		b2. Compare between different poisons based on their harmful effects sources & management.
8.		b3. Relate the procedure of poisoning management to the type of poisons,
9.	B3	b4. Predict the harmful effects of poisons on body organs.
10.	B4	b5. Assess the degree of poisoning based on diagnostic data.
11.		b6. Select the most appropriate procedure to manage a poisoning.
12.	C2	c1. Manage and limit effectively the harmful effects of poisoning.
13.	C4	c2. Search efficiently for information using documented and electronic sources of information.
14.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
15.	D1	d1. Share successfully in team-work.
16.	D2	d2. Show respect to life and commit to community and patients serving.
17.	D3	d3. Communicate effectively with his/her colleagues.
18.	D5	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.



<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3, a4 , a5	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3, b4	Lecture, feed-back learning	Written exam , Attendance, assignments
b5, b6	Lecture , feed-back learning	Written exam , Attendance, assignment, quizzes
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	Lecture , feed-back learning	Written exam , Attendance, assignment, quizzes
c2 , c3	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d4	Feed-back learning	Assignments

V. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>General Toxicology</b>	a1, a2, a3, a4, a5, b1, d2	<ul style="list-style-type: none"> <li>• Definitions</li> <li>• fundamentals and scope of toxicology.</li> <li>• Classification of poisons</li> <li>• Causes of toxicity : accidental, commit suicidal, criminal</li> <li>• General harmful effects of poisons</li> <li>• Approaches to manage poisoning</li> <li>• Mode of actions of poisons</li> <li>• Diagnosis and detection of poisoning</li> <li>• General procedure of management of poisoning</li> </ul>	2	4
sources, mode of action, toxic pathophysiological effects, detection, diagnosis and management of the following types of toxicity					
2	<b>Toxicity caused by acids and alkalis</b>	b2, b3, b4, b5, b6, c1, d2	<ul style="list-style-type: none"> <li>• Acids toxicity</li> <li>• Alkalis toxicity</li> <li>• Salts toxicity</li> </ul>	1	2
3	<b>Toxicity caused by metals and metalloids</b>	b2, b3, b4, b5, b6, c1, d2	<ul style="list-style-type: none"> <li>• Toxicity of copper, selenium, Molybdenum, phosphorus</li> <li>• Iron toxicity</li> </ul>	2	4
4	<b>Toxicity due to heavy metals</b>	b2, b3, b4, b5, b6, c1, d2	Toxicity of Lead, Mercury and Arsenic	2	4
<b>MID-TERM EXAM</b>				1	2
5	<b>Toxicity due to specific chemicals</b>	b2, b3, b4, b5, b6, c1, d2	<ul style="list-style-type: none"> <li>• Toxicity of Cyanide</li> <li>• Toxicity of Hydrogen sulfide</li> <li>• Carbon monoxide</li> </ul>	2	4
6	<b>Toxicity due to simple</b>	b2, b3, b4, b5, b6, c1, d2	<ul style="list-style-type: none"> <li>• Toxicity of Methanol and Isopropyl Alcohols</li> </ul>	2	4

	<b>organic compounds</b>		<ul style="list-style-type: none"> <li>Toxicity of hydrocarbons</li> <li>Toxicity due to fuel : petrolleum , gasoline, etc</li> </ul>		
7	<b>Toxicity due to poisons killing harmful Living organisms</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b6, c1, d2	<ul style="list-style-type: none"> <li>Toxicity of Rodenticides,</li> <li>Toxicity of insecticides</li> <li>Toxicity of Pesticides and Herbicides.</li> <li>Toxicity of Fungicides</li> </ul>	2	4
	<b>Course Review</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b6, c1, d2	b2	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

VI. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to provide a search-based report on toxicity and management of one poison not included in the study topics.	c2, c3, d4	4-13	6
2	<b>Group :</b> each group of students will be assigned to provide a search-based report supported with illustrating videos on poisonous drugs such as narcotics analgesics , nicotine, khat , overdosing of drugs,	c2, c3, d1, d3, d4	14	4

VII. Schedule of Assessment Tasks for Students During the Semester					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b6, c1, d2
2	Assignments (1 + 2)	4, 14	10	10	c2, c3, d1, d3, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b3, b4
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b6, c1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b6, c1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
<b>REFERENCES</b> 1. kokate, text book of forensic pharmacy 2. Peter Viccellio, Handbook of Medical Toxicology
<b>2- Essential References.</b>
1. Casarett & Doull's , Essentials of Toxicology 2. Frank A. Barile, Principles o f toxicology Testing R.S. Gaud G.T. Gupta practical physical
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PHARMACEUTICAL QUALITY CONTROL

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	PHARMACEUTICAL QUALITY CONTROL					
2.	Course Code & Number:	PHRT 16					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( <i>FOURTH</i> ) Year – ( <i>2<sup>ND</sup></i> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>• Analytical chemistry</li> <li>• Pharmaceutical instrumental analysis I &amp; II</li> <li>• Pharmaceutics I , II &amp; III</li> </ul>					
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>• Pharmacy training I</li> </ul>					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course deals with the study of the quality management, requirements, procedures as well as the tests applied to evaluate the quality of raw materials, in-process products and finished pharmaceutical products.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A2	a1. Identify the physicochemical properties of raw materials , in-process products and finished products that are used to evaluate their qualities.
2.	A3	a2. Discuss the references , techniques and procedures applied to evaluate the quality of pharmaceutical raw materials , in-process products and finished products.
3.		a3. Explicit the system of management of quality administration in drug plants and governmental quality control lab.
4.	A4	a4. Comprehend his/her role as a pharmacist in evaluating the quality of pharmaceutical raw materials , in-process products and finished products in drug plants and governmental quality control lab.
5.	B1	b1. Express the quality of raw materials , in-process products and finished products using quantitative or qualitative data.
6.		b2. Interpret the outcoming data obtained after qualitative or quantitative analysis of raw materials , in-process products and finished products
7.		b3. Solve problems related to quality of raw materials , in-process products and finished products.
8.	B2	b4 . Classify the units of Quality control department in drug plants and governmental quality control lab.
9.	B4	b5 . Assess the quality of raw materials , in-process products and finished products using qualitative and quantitative parameters.
10.		b6. Select the appropriate technique to assess a quality parameter
11.	C1	c1.Handle efficiently the tools and chemicals used in pharmaceutical analysis and quality control lab.
12.		c2. Operate successfully the instruments used in pharmaceutical analysis and quality control lab.
13.	C2	c3 . Perform effectively the experiments , practical tasks using standard procedures.
14.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.
15.	C4	c5 .Search efficiently for information using documented and electronic sources of information.

16.		<b>c6.</b> Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	<b>D1</b>	<b>d1.</b> Share successfully in team-work.
18.	<b>D3</b>	<b>d2.</b> Communicate effectively with his/her colleagues.
19.	<b>D4</b>	<b>d3.</b> Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
20.	<b>D5</b>	<b>d4.</b> Demonstrate time management and self-learning during performing practical and professional works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, laboratory practice	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam)
a2, a3	Lecture	Written exam , Attendance
a4	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3	Lecture	Written exam , Attendance



b3	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), Assignments , quizzes
b4	Lecture	Written exam , Attendance
b5, b6	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
<b>(C) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5 , c6	feed-back learning, Group-project laboratory practice	Assignments , Practical assessment (Lab. attendance, reporting, practical exam)
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d2, d3	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to Quality control</b>	a3, a4	<ul style="list-style-type: none"> <li>definition of quality, quality control QC, specifications (qualitative and quantitative) , governmental and drug plant QC lab, Relation and mission of quality management system (QMS), quality assurance (QA), GMP and QC</li> <li>Pharmacopeias : the References of quality control : BP, USP: contents , volumes , understanding monographs</li> </ul>	2	4
2	<b>Units of QC lab</b>	a2, a4	<b>missions of</b> a) Raw materials unit b) In-process unit c) Validation unit d) Microbiology unit e) Finished-product unit	1	2
3	<b>Procedures of QC</b>	a2, a4	<ul style="list-style-type: none"> <li>sampling methods, number of samples based on batch size</li> <li>Checking and calibration of equipments</li> <li>Validation of results: accuracy, precision</li> <li>Documenting and reporting</li> <li>Quarantine, releasing and rejecting</li> </ul>	2	4
4	<b>QC tests of raw materials</b>	a1, a2, a4, b1, b2, b3, b4, b5, b6, d3	<b>Tests of pharmacopeial specification of raw materials</b> identification, assay, microbial content, impurities content, other tests with examples from the pharmacopeia	2	4
<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> <li>Post-exam discussion</li> </ul>				1	2

5	<b>QC tests of raw In-process products</b>	a1, a2, a4, b1, b2, b3, b4, b5, b6, d3	Evaluation of specification of products resulting from unit-operations : drying, evaporation, filtration, milling, granulation, mixing	2	4
6	<b>QC tests of raw finished products , package and labels</b>	a1, a2, a4, b1, b2, b3, b4, b5, b6, d3	<p><b>specific Tests ( pharmacopeial specification) finished products including :</b></p> <ul style="list-style-type: none"> <li>• Solutions</li> <li>• Suspensions &amp; emulsions</li> <li>• Semisolid products</li> <li>• Suppositories</li> <li>• Powders</li> <li>• Granules</li> <li>• Tablets</li> <li>• Capsules</li> <li>• Sterile products : parenteral, ophthalmic preparations</li> </ul> <p><b>Testing of pharmacopeial specifications of :</b></p> <ul style="list-style-type: none"> <li>• Package</li> </ul> <p>Labels : information</p>	4	8
	<b>Course Review</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs
1.	QC sampling , checking of equipments & reporting	1	2	a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
2.	QC of raw materials : paracetamol BP	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
3.	QC of in-process products after : mixing	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
4.	QC of in-process finished products : solution chlorpheniramine syrup BP	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
5.	QC of in-process finished products : suspension metronidazole suspension USP	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
6.	QC of in-process finished products : creams miconazole cream BP	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
7.	QC of in-process finished products : suppositories paracetamol suppositories		2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
8.	QC of in-process finished products : paracetamol tablet friability hardness	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
9.	QC of in-process finished products : paracetamol tablet ( dissolution, disintegration)	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
10.	QC of in-process finished products : capsules amoxicillin capsules USP	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
11.	QC labels of labels & package	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to solve the problems provided by the teacher at the end of each unit	b3, c6, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to provide a search-based report on comparison between BP & USP pharmacopeial specifications of <ul style="list-style-type: none"> <li>• Raw materials</li> <li>• Tablets</li> <li>• Capsules</li> <li>• Suspensions</li> <li>• Microbial content</li> </ul>	c5, c6, d1, d2, d3, d4	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3
2	Assignments (1 + 2)	4, 14	5	5	b3, c5, c6, d1, d2, d3, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3, b4, b6, b7, b8, b9
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
2	Lab. Attitude	weekly	2	2	c4, d1, d2, d3
3	Lab. Accomplishments	weekly	5	5	b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b2, b2, b3, b5, b6
6	Practical exam (practical)	14	20	20	a1, a2, , b1, b2, b2, b3, b5, b6, c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Marayya. Quality assurance and quality management in pharmaceutical industry
2. British pharmacopeia, 2013 Manohar. pharmaceutical quality assurance

### 2- Essential References.

1. USP, 2009
2. A. P. Kulkarni. Process instrumentation And control
3. Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA

### 3- Electronic Materials and Web Sites etc.

- [www.en.wikipedia.org/](http://www.en.wikipedia.org/)
- [www.pharmacoeia.com](http://www.pharmacoeia.com)
- [www.usp.org](http://www.usp.org)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of

### PHARMACEUTICAL QIALITY CONTROL

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

#### II. Course Description:

The course deals with the study of the quality management, requirements, procedures as well as the tests applied to evaluate the quality of raw materials, in-process products and finished pharmaceutical products.



<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A2	a1. Identify the physicochemical properties of raw materials , in-process products and finished products that are used to evaluate their qualities.
2.	A3	a2. Discuss the references , techniques and procedures applied to evaluate the quality of pharmaceutical raw materials , in-process products and finished products.
3.		a3. Explicit the system of management of quality administration in drug plants and governmental quality control lab.
4.	A4	a4. Comprehend his/her role as a pharmacist in evaluating the quality of pharmaceutical raw materials , in-process products and finished products in drug plants and governmental quality control lab.
5.	B1	b1. Express the quality of raw materials , in-process products and finished products using quantitative or qualitative data.
6.		b2. Interpret the outcoming data obtained after qualitative or quantitative analysis of raw materials , in-process products and finished products
7.		b3. Solve problems related to quality of raw materials , in-process products and finished products.
8.	B2	b4 . Classify the units of Quality control department in drug plants and governmental quality control lab.
9.	B4	b5 . Assess the quality of raw materials , in-process products and finished products using qualitative and quantitative parameters.
10.		b6. Select the appropriate technique to assess a quality parameter
11.	C1	c1.Handle efficiently the tools and chemicals used in pharmaceutical analysis and quality control lab.
12.		c2. Operate successfully the instruments used in pharmaceutical analysis and quality control lab.
13.	C2	c3 . Perform effectively the experiments , practical tasks using standard procedures.
14.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.
15.	C4	c5 .Search efficiently for information using documented and electronic sources of information.

16.		<b>c6.</b> Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	<b>D1</b>	<b>d1.</b> Share successfully in team-work.
18.	<b>D3</b>	<b>d2.</b> Communicate effectively with his/her colleagues.
19.	<b>D4</b>	<b>d3.</b> Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
20.	<b>D5</b>	<b>d4.</b> Demonstrate time management and self-learning during performing practical and professional works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, laboratory practice	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam)
a2, a3	Lecture	Written exam , Attendance
a4	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3	Lecture	Written exam , Attendance

b3	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), Assignments , quizzes
b4	Lecture	Written exam , Attendance
b5, b6	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
<b>(C) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5 , c6	feed-back learning, Group-project laboratory practice	Assignments , Practical assessment (Lab. attendance, reporting, practical exam)
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d2, d3	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to Quality control</b>	a3, a4	<ul style="list-style-type: none"> <li>definition of quality, quality control QC, specifications (qualitative and quantitative) , governmental and drug plant QC lab, Relation and mission of quality management system (QMS), quality assurance (QA), GMP and QC</li> <li>Pharmacopeias : the References of quality control : BP, USP: contents , volumes , understanding monographs</li> </ul>	2	4
2	<b>Units of QC lab</b>	a2, a4	<b>missions of</b> a) Raw materials unit b) In-process unit c) Validation unit d) Microbiology unit e) Finished-product unit	1	2
3	<b>Procedures of QC</b>	a2, a4	<ul style="list-style-type: none"> <li>sampling methods, number of samples based on batch size</li> <li>Checking and calibration of equipments</li> <li>Validation of results: accuracy, precision</li> <li>Documenting and reporting</li> <li>Quarantine, releasing and rejecting</li> </ul>	2	4
4	<b>QC tests of raw materials</b>	a1, a2, a4, b1, b2, b3, b4, b5, b6, d3	<b>Tests of pharmacopeial specification of raw materials</b> identification, assay, microbial content, impurities content, other tests with examples from the pharmacopeia	2	4
<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> <li>Post-exam discussion</li> </ul>				1	2

5	<b>QC tests of raw In-process products</b>	a1, a2, a4, b1, b2, b3, b4, b5, b6, d3	Evaluation of specification of products resulting from unit-operations : drying, evaporation, filtration, milling, granulation, mixing	2	4
6	<b>QC tests of raw finished products , package and labels</b>	a1, a2, a4, b1, b2, b3, b4, b5, b6, d3	<p><b>specific Tests ( pharmacopeial specification) finished products including :</b></p> <ul style="list-style-type: none"> <li>• Solutions</li> <li>• Suspensions &amp; emulsions</li> <li>• Semisolid products</li> <li>• Suppositories</li> <li>• Powders</li> <li>• Granules</li> <li>• Tablets</li> <li>• Capsules</li> <li>• Sterile products : parenteral, ophthalmic preparations</li> </ul> <p><b>Testing of pharmacopeial specifications of :</b></p> <ul style="list-style-type: none"> <li>• Package</li> </ul> <p>Labels : information</p>	4	8
	<b>Course Review</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs
1.	QC sampling , checking of equipments & reporting	1	2	a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
2.	QC of raw materials : paracetamol BP	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
3.	QC of in-process products after : mixing	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
4.	QC of in-process finished products : solution chlorpheniramine syrup BP	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
5.	QC of in-process finished products : suspension metronidazole suspension USP	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
6.	QC of in-process finished products : creams miconazole cream BP	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
7.	QC of in-process finished products : suppositories paracetamol suppositories		2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
8.	QC of in-process finished products : paracetamol tablet friability hardness	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
9.	QC of in-process finished products : paracetamol tablet ( dissolution, disintegration)	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
10.	QC of in-process finished products : capsules amoxicillin capsules USP	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
11.	QC labels of labels & package	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VII. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to solve the problems provided by the teacher at the end of each unit	b3, c6, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to provide a search-based report on comparison between BP & USP pharmacopeial specifications of <ul style="list-style-type: none"> <li>• Raw materials</li> <li>• Tablets</li> <li>• Capsules</li> <li>• Suspensions</li> <li>• Microbial content</li> </ul>	c5, c6, d1, d2, d3, d4	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3
2	Assignments (1 + 2)	4, 14	5	5	b3, c5, c6, d1, d2, d3, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3, b4, b6, b7, b8, b9
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
2	Lab. Attitude	weekly	2	2	c4, d1, d2, d3
3	Lab. Accomplishments	weekly	5	5	b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b2, b2, b3, b5, b6
6	Practical exam (practical)	14	20	20	a1, a2, , b1, b2, b2, b3, b5, b6, c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Marayya. Quality assurance and quality management in pharmaceutical industry
2. British pharmacopeia, 2013 Manohar. pharmaceutical quality assurance

### 2- Essential References.

4. USP, 2009
5. A. P. Kulkarni. Process instrumentation And control
6. Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA

### 3- Electronic Materials and Web Sites etc.

- [www.en.wikipedia.org/](http://www.en.wikipedia.org/)
- [www.pharmacoeia.com](http://www.pharmacoeia.com)
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## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
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5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
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Medical sciences college  
 Department: Pharmacy  
 Title of the Program: PHARMACY BACHELOR

## Course Specification

### INDUSTRIAL PHARMACY

I. Course Identification and General Information:							
1.	Course Title:	INDUSTRIAL PHARMACY					
2.	Course Code & Number:	PHRT 18					
3.	Credit hours:	C.H			TOTAL		
		Theoretical					
		L.	Tut.	S.		P.	Tr.
		3	-	-		-	-
4.	Study level/ semester at which this course is offered:	( <i>FOURTH</i> ) Year – ( <i>2<sup>ND</sup></i> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>• Pharmaceutics I, II &amp; III</li> </ul>					
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>• Pharmacy Training I</li> </ul>					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of criteria for good manufacturing practice (GMP) and the substantial unit operations during manufacturing of drug products in drug plants.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A2	a1. Determine the physicochemical properties of materials (raw, in-process materials) that affect the manufacturing of drug products.
2.	A3	a2. Explicit the physical principles of unit operations applied in manufacturing of drug products.
3.		a3. Discuss the criteria of GMP and the techniques , equipments & machines used for manufacturing of drug products.
4.	A4	a4. Comprehend his/her role as a pharmacist in employment GMP criteria and to operate and supervise unit operations for manufacturing of drug products.
5.	B1	b1. Solve problems of production and operation of equipments and machines used for manufacturing drug products.
6.	B2	b2 .Classify various equipments & machines and techniques used in unit operations for manufacturing of drug products.
7.		b3. Compare between various techniques used in unit operations for manufacturing of drug products.
8.		b4. Relate the quality of drug products to employment of GMP criteria.
9.	B3	b5. Predict the reasons for improper quality of drug products .
10.	B4	b6. Assess the implementing of GMP criteria in a drug plant
11.		b7. Select the best technique for performing a unit operation used for manufacturing of drug products.
12.	C1	c1. Operate successfully the equipments & machines of a unit operation for manufacturing of drug products.
13.	C3	c2 .Take the required safety criteria during various equipments & machines and machines used for manufacturing dug products.
14.	C4	c3 .Search efficiently for information using documented and electronic sources of information.
15.		c4. Present and report his/her works correctly using appropriate writing rules and technologies media.
16.	D1	d1. Share successfully in team-work.
17.	D4	d2. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
18.	D5	d3. Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
a1, a2, a3, a4	Lecture feed back learning	Written exam , Attendance Assignments ,
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
b1	Lecture Feed-back learning	Written exam , Attendance Assignments
b2, b3, b4, b5, b6, b7	Lecture Feed-back learning	Written exam , Attendance assignments, quizzes
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2	Lecture	Written exam , Attendance
c3, c4	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, , d2	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d3	Feed-back learning	Assignments

## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to industrial pharmacy</b>	a3, a4,d2,	<ul style="list-style-type: none"> <li>• Significance and history of large scale manufacturing of drug products.</li> <li>• Criteria of good manufacturing practice (GMP) based on WHO-GMP guidelines</li> <li>• materials of drug plant construction</li> </ul>	2	6
Definition, advantages, disadvantages, factors affecting, types , operation and selection of equipments, solving of problems, safety requirement, applications of the following:					
2	<b>General principles of transfer &amp; flow</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, b7, c1, c2, d2	a. heat transfer b. mass transfer c. fluid flow	2	6
3	<b>Fundamental premixing unit operationns (applied to fluids)</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, b7, c1, c2, d2	a. fluid clarification - Filtration - Centrifugation b. Solvent Extraction c. Evaporation d. Distillation	3	9
			mid-term exam postexam discussion		
2	<b>Fundamental premixing unit operations (applied to solids)</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, b7, c1, c2, d2	a. crystallization b. drying c. particle size reduction (milling) & enlargement (granulation)	1	3
5	<b>Mixing unit operation</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, b7,	a) Solid-solid mixing b) Solid-fluid and fluid-fluid mixing c) Semisolid mixing	2	6

		c1, c2, d2			
6	<b>Specific Post-Mixing unit operation</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, b7, c1, c2, d2	a. Filling of finished product b. packaging.	2	6
	<b>Course Review</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, b7, c1, c2, d2	Review of the course topics by discussion session.	1	3
FINAL - EXAM				1	3
<b>TOTAL</b>				16	48
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Seminars**: these are mainly used with small groups of students (20-30) students in which they find better chances for discussing and participating in the teaching process.

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : Every student is assigned to provide a search-based video-illustrating one operation studied in this course.	a3, c3, c4, d3	4-13	6
2	<b>Group</b> : The teacher will	b1, b5, c3, c4, d1, , d3	14	4

	provide the students with a number of problems related to operation and production studied in this course. The student group is assigned to provide technical solutions of one of those problems.			
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### VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	b1, b5, c3, c4, d1, , d3
2	Assignments (1 + 2)	4, 14	10	10	a3, b1, b5, c3, c4, d1, , d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b3, b4, b5
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	b1, b5, c3, c4, d1, , d3
5	Final exam of theoretical part ( written exam)	17	60	60	b1, b5, c3, c4, d1, , d3
<b>TOTAL</b>			100	100 %	100

### VIII. Learning Resources:

#### 1- Required Textbook(s) ( maximum two ).

1. Aulton M.E., *Pharmaceutics: the science of dosage form design*, 2002, Churchill Livingstone
2. Lachman, *Theory and Practice of Industrial Pharmacy*

#### 2- Essential References.

1. Vidya. pharmaceutical industrial management
2. Chandrasekhar. Pharmaceutical engineering
3. Jyothi. pharmaceutical engineering

#### 3- Electronic Materials and Web Sites etc.

### IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



**Al-RaziUniversity**  
**Medical sciences college**

Department: pharmacy

**Title of the Program: PHARMACY BACHELOR**

**Course Plan (Syllabus) of INDUSTRIAL PHARMACY**

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							



## Course Specification

### ADVANCED DRUG DELIVERY SYSTEMS

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	ADVANCED DRUG DELIVERY SYSTEMS					
2.	Course Code & Number:	PHRT 13					
3.	Credit hours:	C.H			TOTAL		
		Theoretical					
		L.	Tut.	S.		P.	Tr.
		3	-	-		-	-
4.	Study level/ semester at which this course is offered:	( <i>FOURTH</i> ) Year – ( <i>2<sup>nd</sup></i> ) semester					
5.	Pre –requisite (if any):	• Pharmaceutics I , II, III					
6.	Co –requisite (if any):	Biopharmaceutics					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of principles and techniques of advanced and novel drug delivery systems.

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A1	a1. Explain the biological features overcome or utilized to provide advanced and novel drug delivery systems.
2.	A2	a2. Provide examples of drugs delivered by advanced and novel delivery systems.
3.		a3. Determine the physicochemical properties of drugs to be candidates novel drug delivery systems.
4.	A3	a4. Explicit the need and principle of technologies for novel and advanced drug delivery systems including those of targeted delivery systems.
5.		
6.	A4	a5. Comprehend his/her role as a pharmacist in designing and implementing novel drug delivery systems to treat diseases.
7.	B2	b1. Classify advanced and novel drug delivery systems.
8.		b2. Compare between and advanced and novel drug delivery systems regarding their principles, designs and applications
9.	B4	b3. Assess the efficacy of advanced and novel drug delivery systems.
10.		b4. Select the most appropriate advanced and novel drug delivery systems.
11.	C4	c1. Search efficiently for information using documented and electronic sources of information.
12.		c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
13.	D1	d1. Share successfully in team-work.
14.	D2	d2. Show respect to life and commit to community and patients serving.
15.	D3	d3. Communicate effectively with his/her colleagues, members of health care team, patients and community
16.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
17.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

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<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3, a4, a5	Lecture, feed-back leaning	Written exam , Attendance, assignment
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3, b4	Lecture, feed-back learning	Written exam , Attendance, assignments
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	Feed-back learning	Assignments

IV. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>introduction to advanced and novel drug delivery systems</b>	a4	<ul style="list-style-type: none"> <li>• The need for advanced and novel drug delivery systems               <ul style="list-style-type: none"> <li>○ Factors related to patients convenience</li> <li>○ New diseases : new challenges</li> <li>○ Diseases resistant to classical systems</li> <li>○ Other factors</li> <li>○ Comparison between advanced and classical delivery systems</li> </ul> </li> </ul>	1	3
2	<b>Extended release systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	<ul style="list-style-type: none"> <li>• Definition and purposes</li> <li>• Concepts of extended-release, sustained-release</li> <li>• Advantages and limitations,</li> <li>• Biological features affecting extended-delivery system.</li> <li>• Technology of Microencapsulation</li> <li>• multiple units coating (pellets)</li> <li>• floating tablets</li> <li>• bilayer and multiple layer-tablets</li> </ul>	3	9
3	<b>Transdermal delivery systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	<ul style="list-style-type: none"> <li>• Biological features affecting transdermal delivery system.</li> <li>• Principle, components, formulation, advantages, disadvantages types and applications of :               <ul style="list-style-type: none"> <li>○ Patches</li> <li>○ Phonophoresis</li> <li>○ Inotophoresis</li> <li>○ Electroporation</li> <li>○ Needle array and needleless injection systems</li> <li>○ Percutaneous enhancers</li> </ul> </li> </ul>	3	9

mid-term exam				1	3
4	<b>advanced Sterile systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	Principle, components, formulation, advantages, disadvantages types and applications of : <ul style="list-style-type: none"> <li>○ Implants</li> <li>○ Ocuserts</li> </ul>	1	3
5	<b>advanced inhalation delivery systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	<ul style="list-style-type: none"> <li>• Biological features affecting inhalation delivery system.</li> <li>• Principle, components, formulation, advantages, disadvantages types and applications of : <ul style="list-style-type: none"> <li>○ Dry solid inhaler systems</li> </ul> </li> </ul>	1	3
6	<b>advanced intravaginal delivery systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	<ul style="list-style-type: none"> <li>• Biological features affecting newer intravaginal delivery system.</li> <li>• Principle, components, formulation, advantages, disadvantages and types of intravaginal systems</li> </ul>	1	3
7	<b>Targeted delivery systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	<ul style="list-style-type: none"> <li>• Definition</li> <li>• Purposes</li> <li>• Biological features affecting targeted delivery system.</li> <li>• Principle, components, formulation, advantages, disadvantages types and applications of : <ul style="list-style-type: none"> <li>❖ cellular Types of targeted delivery systems <ul style="list-style-type: none"> <li>○ T-lymphocytes</li> <li>○ Lysosome</li> </ul> </li> <li>❖ Particle Types of targeted delivery systems <ul style="list-style-type: none"> <li>○ Liposomes</li> <li>○ Monoclonal antibodies</li> <li>○ Plasma proteins</li> <li>○ Polymeric micelles</li> </ul> </li> </ul> </li> </ul>	3	9

			<ul style="list-style-type: none"> <li>❖ Prodrug Types of targeted delivery systems               <ul style="list-style-type: none"> <li>○ Conjugation with peptides</li> <li>○ Gene (or antibodies)-directed enzyme system</li> <li>○ Drug-linkage-ligand system</li> </ul> </li> </ul>		
<b>Course Review</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	Review of the course topics by discussion session.		1	3
FINAL - EXAM				1	3
<b>TOTAL</b>				16	48
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills



## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to provide a summary of one of the studied topics.	c3, c4, d5	4-13	6
2	<b>Group :</b> each group of students will be assigned to provide a search-based report of one novel drug delivery systems	c3, c4, d1, d3, d5	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4
2	Assignments (1 + 2)	4, 14	10	10	c3, c4, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, c1
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4
TOTAL			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
<ol style="list-style-type: none"> <li>1. Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins</li> <li>2. Kewal k. Jain. drug delivery systems</li> </ol>
<b>2- Essential References.</b>
<ol style="list-style-type: none"> <li>3. Ottenbrite. Polymeric drugs &amp; drug delivery system</li> <li>1. Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone.</li> </ol>
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of

### ADVANCED DRUG DELIVERY SYSTEMS

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department ;	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
<p>The course deals with the study of principles and techniques of advanced and novel drug delivery systems.</p>

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A1	a1. Explain the biological features overcome or utilized to provide advanced and novel drug delivery systems.
2.	A2	a2. Provide examples of drugs delivered by advanced and novel delivery systems.
3.		a3. Determine the physicochemical properties of drugs to be candidates novel drug delivery systems.
4.	A3	a4. Explicit the need and principle of technologies for novel and advanced drug delivery systems including those of targeted delivery systems.
5.		
6.	A4	a5. Comprehend his/her role as a pharmacist in designing and implementing novel drug delivery systems to treat diseases.
7.	B2	b1 . Classify advanced and novel drug delivery systems.
8.		b2. Compare between and advanced and novel drug delivery systems regarding their principles, designs and applications
9.	B4	b3 . Assess the efficacy of advanced and novel drug delivery systems.
10.		b4. Select the most appropriate advanced and novel drug delivery systems.
11.	C4	c1 .Search efficiently for information using documented and electronic sources of information.
12.		c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
13.	D1	d1. Share successfully in team-work.
14.	D2	d2. Show respect to life and commit to community and patients serving.
15.	D3	d3. Communicate effectively with his/her colleagues, members of health care team, patients and community
16.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
17.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3, a4, a5	Lecture, feed-back leaning	Written exam , Attendance, assignment
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3, b4	Lecture, feed-back learning	Written exam , Attendance, assignments
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	Feed-back learning	Assignments

IV. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>introduction to advanced and novel drug delivery systems</b>	a4	<ul style="list-style-type: none"> <li>• The need for advanced and novel drug delivery systems               <ul style="list-style-type: none"> <li>○ Factors related to patients convenience</li> <li>○ New diseases : new challenges</li> <li>○ Diseases resistant to classical systems</li> <li>○ Other factors</li> <li>○ Comparison between advanced and classical delivery systems</li> </ul> </li> </ul>	1	3
2	<b>Extended release systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	<ul style="list-style-type: none"> <li>• Definition and purposes</li> <li>• Concepts of extended-release, sustained-release</li> <li>• Advantages and limitations,</li> <li>• Biological features affecting extended-delivery system.</li> <li>• Technology of Microencapsulation</li> <li>• multiple units coating (pellets)</li> <li>• floating tablets</li> <li>• bilayer and multiple layer-tablets</li> </ul>	3	9
3	<b>Transdermal delivery systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	<ul style="list-style-type: none"> <li>• Biological features affecting transdermal delivery system.</li> <li>• Principle, components, formulation, advantages, disadvantages types and applications of :               <ul style="list-style-type: none"> <li>○ Patches</li> <li>○ Phonophoresis</li> <li>○ Inotophoresis</li> <li>○ Electroporation</li> <li>○ Needle array and needleless injection systems</li> <li>○ Percutaneous enhancers</li> </ul> </li> </ul>	3	9

mid-term exam				1	3
4	<b>advanced Sterile systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	Principle, components, formulation, advantages, disadvantages types and applications of : <ul style="list-style-type: none"> <li>○ Implants</li> <li>○ Ocuserts</li> </ul>	1	3
5	<b>advanced inhalation delivery systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	<ul style="list-style-type: none"> <li>• Biological features affecting inhalation delivery system.</li> <li>• Principle, components, formulation, advantages, disadvantages types and applications of :  <ul style="list-style-type: none"> <li>○ Dry solid inhaler systems</li> </ul> </li> </ul>	1	3
6	<b>advanced intravaginal delivery systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	<ul style="list-style-type: none"> <li>• Biological features affecting newer intravaginal delivery system.</li> <li>• Principle, components, formulation, advantages, disadvantages and types of intravaginal systems</li> </ul>	1	3
7	<b>Targeted delivery systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	<ul style="list-style-type: none"> <li>• Definition</li> <li>• Purposes</li> <li>• Biological features affecting targeted delivery system.</li> <li>• Principle, components, formulation, advantages, disadvantages types and applications of :  <ul style="list-style-type: none"> <li>❖ cellular Types of targeted delivery systems <ul style="list-style-type: none"> <li>○ T-lymphocytes</li> <li>○ Lysosome</li> </ul> </li> <li>❖ Particle Types of targeted delivery systems <ul style="list-style-type: none"> <li>○ Liposomes</li> <li>○ Monoclonal antibodies</li> <li>○ Plasma proteins</li> <li>○ Polymeric micelles</li> </ul> </li> </ul> </li> </ul>	3	9

			<ul style="list-style-type: none"> <li>❖ Prodrug Types of targeted delivery systems               <ul style="list-style-type: none"> <li>○ Conjugation with peptides</li> <li>○ Gene (or antibodies)-directed enzyme system</li> <li>○ Drug-linkage-ligand system</li> </ul> </li> </ul>		
<b>Course Review</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	Review of the course topics by discussion session.		1	3
FINAL - EXAM				1	3
<b>TOTAL</b>				16	48
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units

## VI. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills



## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to provide a summary of one of the studied topics.	c3, c4, d5	4-13	6
2	<b>Group :</b> each group of students will be assigned to provide a search-based report of one novel drug delivery systems	c3, c4, d1, d3, d5	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4
2	Assignments (1 + 2)	4, 14	10	10	c3, c4, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, c1
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4
TOTAL			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
<ol style="list-style-type: none"> <li>1. Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins</li> <li>2. Kewal k. Jain. drug delivery systems</li> </ol>
<b>2- Essential References.</b>
<ol style="list-style-type: none"> <li>1. Ottenbrite. Polymeric drugs &amp; drug delivery system</li> <li>2. Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone.</li> </ol>
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### HOSPITAL PHARMACY

I. Course Identification and General Information:					
1.	Course Title:	HOSPITAL PHARMACY			
2.	Course Code & Number:	PHRT 18			
3.	Credit hours:	C.H			TOTAL
		Theoretical			
		L.	Tut.	S.	
		2	-	2	
		P.	Tr.		
		-	-	2	
4.	Study level/ semester at which this course is offered:	( FOURTH ) Year – ( 2 <sup>ND</sup> ) semester			
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>• Introduction to pharmacy profession</li> <li>• Pharmaceutical calculations skills</li> <li>• Pharmacology I , II</li> <li>• Clinical pharmacy I</li> </ul>			
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>• None</li> </ul>			
7.	Program (s) in which the course is offered:	All BC programs offered by the university			
8.	Language of teaching the course:	ENGLISH			
9.	Location of teaching the course:	IN THE UNIVERSITY			
10	Prepared By:				
11	Date of Approval	10/2014			

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course is designed to provide the students with essential knowledge and skills necessary to offer hospital pharmaceutical services to in-patient and out-patients in health-care facilities. The course is an introduction to pharmacy training courses starting in the next semester.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Identify types of specific drug products in hospital pharmacy including extemporaneous preparation , mixed IV preparations and total parenteral nutrition (TPN).
2.		a2. Determine the components, advantages and disadvantages of hospital formulary (HF), IV-admixtures and TPN prepared in hospital pharmacy
3.	A3	a3. Explicit hospital pharmacy design, the systems of drug distribution , conditions of storage of drug products in hospitals, pharmacy procurement and the pharmaceutical care services offered by hospital pharmacists to patients in health care facilities.
4.		a4. Grasp knowledge and skills required to practice hospital pharmacy in health care facilities.
5.	A4	a5. Comprehend his/her role as a pharmacist Comprehend his/her role as a pharmacist in offering hospital pharmaceutical care services to in-patient and out-patient and his/her role as a member of the pharmacy & therapeutic committee.
6.	B1	b1. Solve problems related to reparation, storage, administration and dosing of IV admixtures, TPN and other preparations compounded by the pharmacist in hospital pharmacy.
7.	B2	b2 .Classify drug products in hospital pharmacy.
8.	B3	b3. Predict the reason of incompatibilities in IV-admixtures.
9.	B4	b4 . Assess the compatibility of IV-admixtures.
10.		b5. Select the most appropriate condition and place in the pharmacy to store drug products in hospital pharmacy.
11.	C2	c1. Distribute drugs in hospital to in-patients using standard optimal system.
12.		c2. Dispense drug products to out-patients using standard optimal system.
13.		c3. Avoid mixed IV preparations incompatibility and instability.
14.		c4. Arrange and store drug products correctly in hospital pharmacy .
15.		c5. Determine the type and quantity of drug products required to be purchased in hospital pharmacy.

16.	C4	c6 .Search efficiently for information using documented and electronic sources of information.
17.		c7. Present and report his/her works correctly using appropriate writing rules and technologies media.
18.	D1	d1. Share successfully in team-work.
19.	D2	d2. Show respect to life and commit to community and patients serving.
20.	D3	d3. Communicate effectively with his/her colleagues, members of health care team and patients.
21.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
22.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam , Attendance
a3, a4	Lecture	Written exam , Attendance
a5	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b2	Lecture	Written exam , Attendance
b3	Lecture	Written exam , Attendance
b4, b5	Lecture	Written exam , Attendance

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 , c3 , , c4 , c5	lecture, feed--back learning,	Written exam , Attendance

		Assignments ,
c6 , c7	feed--back learning , Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	Feed-back learning	Assignments

#### IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a4, a5, , d2	definition of hospital pharmacy, difference between community, clinical and hospital pharmacy, requirements of a pharmacist to practice hospital pharmacy, design of ideal hospital pharmacy	1	2
2	<b>Hospital pharmacists in the hospital</b>	a2, a5, d2	personnel organization of hospital pharmacists, duties and mission of hospital pharmacists, pharmacy-therapeutic committee (PTC), hospital formulary (H.F)	1	2
3	<b>Specific types of drug products in the hospital pharmacy</b>	a1, a5, b2, b5, c4, d2	(a) Emergenc4 drugs : types , significance of each type, example of each type (including generic, trade name, dose, strength), storage and dispensing rules (b) Controlled drugs : types , significance of each type, example of each type (including generic, trade name, dose, strength), storage and dispensing rules (b) Operative and pre-operative medication: types , significance of each type, example of each type (including generic, trade name, dose, strength), storage and dispensing rules	2	4
4	<b>drug distribution systems to in-patients</b>	a5, c1, d2	comparison of advantages and disadvantages of floor (ward) stock system, individual prescription system, combined system, unit dose system (procedures), patient`s medications record; checking to avoid duplication and drug interactions	2	4
<b>MID-TERM EXAM</b>				1	2
5	<b>Mixed I.V. preparations (I) I.V. admixtures</b>	a5, b1, b3, b4, b5, c3 , d2	definition, composition, advantages, incompatibilities. Chart of incompatibilities, measures to avoid incompatibilities, aseptic techniques of preparation	2	4

	<b>Mixed I.V. preparations</b> <b>(2) Total parenteral nutrition (TPN)</b>	a5, b1, b5 , d2	definition, advantages, indications, properties (compatibility, sterility), Components :water (required daily amount) , energy sources (lipids, carbohydrates, proteins: required daily as Kcal), electrolytes and trace elements (types, daily required), vitamins (types, daily required)	2	4
6	<b>Out-patients oriented services</b>	a5, c3 , d2	: dispensing of hospital prescriptions, types of hospital prescriptions (written, electronic), checking of prescription, checking of medications, checking of drug doses and interactions, using British national formulary(BNF) and other references, patient`s counseling services.	1	2
7	<b>Pharmacy procurement (medical supply) and storage</b>	a5, c5, d2	<b>Medications to be supplied:</b> types, criteria of procurement (price, quality, availability, capacity and size , approval of PTC and review of H.F.). <b>Packaging and labeling</b> of drugs from large-capacity containers to smaller one. <b>Store of products:</b> arrangement and separation of products based on their properties ( physical states, toxicity, etc.)	1	2
	<b>Course Review</b>	a1, a2, a3, a1, b1, b2, b3, b4, b5, c1, c3, c4, c5, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report	c6, c7, d5	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report	c6, c7, d1, d3, d5	14	4

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to search for incompatibilities of an iv mixed drug and to solve the problems provided by the teacher regarding dosing and preparation of IV admixtures and TPN.	B1, c6, c7, d5	4-13	6
2	<b>Group</b> : each group of students will be assigned to prepare a booklet of hospital formulary concerning with emergency drugs, controlled drugs and operative drugs.	c6, c7, d1, d3, d5	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a1, a2, a6, a3, a4, a5, b1, b2, b3, b1, b2, b6, b7, b8, b3, b3, b4, b5, d2
2	Assignments (1 + 2)	4, 14	10	10	b1, c6, c7, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2, b6, b7, b8, b3
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1,a2, a4, a5, b2, b5, c1, c4, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a1, a2, a6, a3, a4, a5, b1, b2, b3, b1, b2, b6, b7, b8, b3, b3, b4, b5, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Martin Stephens. Hospital pharmacy. 2nd Edition, 2011, Pharmaceutical press. 2. Wasfi Abbas ElTayeb. Lecture notes in Hospital pharmacy, King Saud University
<b>2- Essential References.</b>
1. Paradkar. Hospital and clinical pharmacy 2. Qadry. A text book of hospital pharmacy 3. Mark Jackson, Andrew Lowey. Handbook of extemporaneous preparation., 2010, The NHS Pharmaceutical Quality Assurance Committee, pharmaceutical press.
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

### IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of HOSPITAL PHARMACY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

### II. Course Description:

The course is designed to provide the students with essential knowledge and skills necessary to offer hospital pharmaceutical services to in-patient and out-patients in health-care facilities. The course is an introduction to pharmacy training courses starting in the next semester.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	<b>A2</b>	<b>a1.</b> Identify types of specific drug products in hospital pharmacy including extemporaneous preparation , mixed IV preparations and total parenteral nutrition (TPN).
2.		<b>a2.</b> Determine the components, advantages and disadvantages of hospital formulary (HF), IV-admixtures and TPN prepared in hospital pharmacy
3.	<b>A3</b>	<b>a3.</b> Explicit hospital pharmacy design, the systems of drug distribution , conditions of storage of drug products in hospitals, pharmacy procurement and the pharmaceutical care services offered by hospital pharmacists to patients in health care facilities.
4.		<b>a4.</b> Grasp knowledge and skills required to practice hospital pharmacy in health care facilities.
5.	<b>A4</b>	<b>a5.</b> Comprehend his/her role as a pharmacist Comprehend his/her role as a pharmacist in offering hospital pharmaceutical care services to in-patient and out-patient and his/her role as a member of the pharmacy & therapeutic committee.
6.	<b>B1</b>	<b>b1.</b> Solve problems related to reparation, storage, administration and dosing of IV admixtures, TPN and other preparations compounded by the pharmacist in hospital pharmacy.
7.	<b>B2</b>	<b>b2.</b> Classify drug products in hospital pharmacy.
8.	<b>B3</b>	<b>b3.</b> Predict the reason of incompatibilities in IV-admixtures.
9.	<b>B4</b>	<b>b4.</b> Assess the compatibility of IV-admixtures.
10.		<b>b5.</b> Select the most appropriate condition and place in the pharmacy to store drug products in hospital pharmacy.
11.	<b>C2</b>	<b>c1.</b> Distribute drugs in hospital to in-patients using standard optimal system.
12.		<b>c2.</b> Dispense drug products to out-patients using standard optimal system.
13.		<b>c3.</b> Avoid mixed IV preparations incompatibility and instability.
14.		<b>c4.</b> Arrange and store drug products correctly in hospital pharmacy .
15.		<b>c5.</b> Determine the type and quantity of drug products required to be purchased in hospital pharmacy.
16.	<b>C4</b>	<b>c6.</b> Search efficiently for information using documented and electronic sources of information.

17.		c7. Present and report his/her works correctly using appropriate writing rules and technologies media.
18.	D1	d1. Share successfully in team-work.
19.	D2	d2. Show respect to life and commit to community and patients serving.
20.	D3	d3. Communicate effectively with his/her colleagues, members of health care team and patients.
21.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
22.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

2. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam , Attendance
a3, a4	Lecture	Written exam , Attendance
a5	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b2	Lecture	Written exam , Attendance
b3	Lecture	Written exam , Attendance
b4, b5	Lecture	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 , c3, , c4 , c5	lecture, feed--back learning,	Written exam , Attendance Assignments ,
c6 , c7	feed--back learning , Group-project	Assignments

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	Feed-back learning	Assignments

IV. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a4, a5, , d2	definition of hospital pharmacy, difference between community, clinical and hospital pharmacy, requirements of a pharmacist to practice hospital pharmacy, design of ideal hospital pharmacy	1	2
2	<b>Hospital pharmacists in the hospital</b>	a2, a5, d2	personnel organization of hospital pharmacists, duties and mission of hospital pharmacists, pharmacy-therapeutic committee (PTC), hospital formulary (H.F)	1	2
3	<b>Specific types of drug products in the hospital pharmacy</b>	a1, a5, b2, b5, c4, d2	(c) Emergenc <sup>4</sup> drugs : types , significance of each type, example of each type (including generic, trade name, dose, strength), storage and dispensing rules (d) Controlled drugs : types , significance of each type, example of each type (including generic, trade name, dose, strength), storage and dispensing rules (b) Operative and pre-operative medication: types , significance of each type, example of each type (including generic, trade name, dose, strength), storage and dispensing rules	2	4
4	<b>drug distribution systems to in-patients</b>	a5, c1, d2	comparison of advantages and disadvantages of floor (ward) stock system, individual prescription system, combined system, unit dose system (procedures), patient`s medications record; checking to avoid duplication and drug interactions	2	4
<b>MID-TERM EXAM</b>				1	2
5	<b>Mixed I.V. preparations (1) I.V. admixtures</b>	a5, b1, b3, b4, b5, c3 , d2	definition, composition, advantages, incompatibilities. Chart of incompatibilities, measures to avoid incompatibilities, aseptic techniques of preparation	2	4



	<b>Mixed I.V. preparations (2) Total parenteral nutrition (TPN)</b>	a5, b1, b5, d2	definition, advantages, indications, properties (compatibility, sterility), Components :water (required daily amount) , energy sources (lipids, carbohydrates, proteins: required daily as Kcal), electrolytes and trace elements (types, daily required), vitamins (types, daily required)	2	4
6	<b>Out-patients oriented services</b>	a5, c3 , d2	: dispensing of hospital prescriptions, types of hospital prescriptions (written, electronic), checking of prescription, checking of medications, checking of drug doses and interactions, using British national formulary(BNF) and other references, patient`s counseling services.	1	2
7	<b>Pharmacy procurement (medical supply) and storage</b>	a5, c5, d2	<b>Medications to be supplied:</b> types, criteria of procurement (price, quality, availability, capacity and size , approval of PTC and review of H.F.). <b>Packaging and labeling</b> of drugs from large-capacity containers to smaller one. <b>Store of products:</b> arrangement and separation of products based on their properties ( physical states, toxicity, etc.)	1	2
	<b>Course Review</b>	a1, a2, a3, a1, b1, b2, b3, b4, b5, c1, c3, c4, c5, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to search for incompatibilities of an iv mixed drug and to solve the problems provided by the teacher regarding dosing and preparation of IV admixtures and TPN.	B1, c6, c7, d5	4-13	6
2	<b>Group</b> : each group of students will be assigned to prepare a booklet of hospital formulary concerning with emergency drugs, controlled drugs and operative drugs.	c6, c7, d1, d3, d5	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a1, a2, a6, a3, a4, a5, b1, b2, b3, b1, b2, b6, b7, b8, b3, b3, b4, b5, d2
2	Assignments (1 + 2)	4, 14	10	10	b1, c6, c7, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2, b6, b7, b8, b3
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1,a2, a4, ,a5, b2, b5, c1, c4, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a1, a2, a6, a3, a4, a5, b1, b2, b3, b1, b2, b6, b7, b8, b3, b3, b4, b5, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Martin Stephens. Hospital pharmacy. 2nd Edition, 2011, Pharmaceutical press. 2. Wasfi Abbas ElTayeb. Lecture notes in Hospital pharmacy, King Saud University
<b>2- Essential References.</b>
1. Paradkar. Hospital and clinical pharmacy 2. Qadry. A text book of hospital pharmacy 3. Mark Jackson, Andrew Lowey. Handbook of extemporaneous preparation., 2010, The NHS Pharmaceutical Quality Assurance Committee, pharmaceutical press.
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

IX.Course Policies:	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

Medical sciences college  
 Department: Pharmacy  
 Title of the Program: PHARMACY BACHELOR

## Course Specification

### PHARMACY TRAINING II

I. Course Identification and General Information:						
1.	Course Title:	PHARMACY TRAINING II				
2.	Course Code & Number:	PHRT 21				
3.	Credit hours:	C.H				TOTAL
		Theoretical		P.		
		L.	Tut.		S.	
		-	-	-	-	2
<b>2 credit hours equivalent to 250 contact hours</b>						
4.	Study level/ semester at which this course is offered:	<i>( FIFTH ) Year – ( 1<sup>ST</sup> ) semester</i>				
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>• Introduction to pharmacy profession</li> <li>• Pharmaceutics I, II &amp; III</li> <li>• Pharmacotherapy I &amp; II</li> <li>• Pharmacology I &amp; II &amp; III</li> <li>• Pharmacy practice skills</li> </ul>				
6.	Co –requisite (if any):					
7.	Program (s) in which the course is offered:	All BC programs offered by the university				
8.	Language of teaching the course:	ENGLISH				
9.	Location of teaching the course:	IN THE UNIVERSITY				
10	Prepared By:					
11	Date of Approval					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

This is a field training course designed to allow students to apply their knowledge and skills in the real world. The course is complementary to "Pharmacy Training I " course and concerns with training in community pharmacies.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	C2	c3 . Administer community pharmacy effectively and efficiently.
2.		c4. Provide the service of counseling to patients in community pharmacies.
3.		c5. Dispense drug products effectively in community pharmacies.
4.		c6. Select appropriate Over The Counter "OTC" drug products to treat minor disorders of patients.
5.		c7 .Store and arrange dug products in community pharmacies using standard procedures.
6.		c8. Practice pharmacy-related documentation.
7.	C4	c9. Present and report his/her works correctly using appropriate writing rules and technologies media.
8.	D1	d1. Share successfully in team-work.
9.	D2	d2. Show respect to life and commit to community and patients serving.
10.	D3	d3. Communicate effectively with his/her colleagues and patients.
11.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
12.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c3, c4 , c5, c6, c7, c8	Field training	Field training assessment

<b>c9</b>	<b>Field training</b>	<b>Field training assessment</b>
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1, d3, d4</b>	<b>Field training , Group-projects</b>	<b>Field training assessment</b>
<b>d2</b>	<b>Field training</b>	<b>Field training assessment</b>
<b>d5</b>	<b>Field training</b>	<b>Field training assessment</b>

<b>IV. Course Content:</b>					
<b>Order</b>	<b>Units/ Topics List</b>	<b>CILOs</b>	<b>Sub Topics List</b>	<b>No. of Weeks</b>	<b>contact hours</b>
1	<b>Drug products arrangement and Storage</b>	c7, d1, d2, d3, d4, d5	<ul style="list-style-type: none"> <li>• Arrangement of drug products in community pharmacy</li> <li>• Application the specific storage conditions for drug</li> </ul>	1 - 5 <sup>th</sup> week	

			<ul style="list-style-type: none"> <li>products</li> <li>Reporting of types of drug products in the pharmacy</li> </ul>		70
2	<b>Skills of dispensing</b>	c5, d1, d2, d3, d4, d5	<ul style="list-style-type: none"> <li>Application of Dispensing regulations</li> <li>Medical prescriptions and interpretation</li> <li>Dispensing of controlled drugs</li> </ul>	6 <sup>th</sup> week – 8 <sup>th</sup> week	40
	<b>skills of Patients counseling services &amp; drug information</b>	c4, c6 d1, d2, d3, d4, d5	<ul style="list-style-type: none"> <li>Skills of communication with patients</li> <li>Responding to patients questions</li> <li>Counseling related to Drug products use</li> <li>Recommendation of OTC products</li> <li>Drug indexes : types, how to use</li> </ul>	9 <sup>th</sup> week – 11 <sup>th</sup> week	50
	<b>Pharmacy management</b>	c3, c8 d1, d2, d3, d4, d5	<ul style="list-style-type: none"> <li>Employments leadership</li> <li>Sale &amp; purchasing skills</li> <li>Ordering of drug products</li> <li>Documentation</li> <li>Financial tasks.</li> </ul>	12 <sup>th</sup> week – 15 <sup>th</sup> week	90
FINAL - EXAM				1	2
<b>TOTAL</b>				16	250 contact hours equivalent to 2 credit hours
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	2 Units

## V. Teaching strategies of the course:

**Field training:** each 2-3 students are commissioned to do certain assignments in a real field entity such as drug factory, hospitals, pharmacies under supervision of both the field principle and an academic supervisor



VI. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : each student is assigned to provide a tabulated list of drug products in the pharmacy. The table should include : generic name, trade, dosage form, strength manufacturer, country , local agent and drugs are pharmacologically indexed.	c3, d5	1- 14 th week	14
2	<b>Group</b> : the group will be assigned to provide a number ( 5-8) cases of patient counseling they have encountered during their practicing training in the pharmacies	c4, d1	1- 14 th week	6

VII. Schedule of Assessment Tasks for Students During the Semester					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance ( assessed by the supervisor)		10	10 %	c3, c4, c5, c6, c7, c8, c9, d1, d2, d3, d4, d5
2	Attitude (assessed by the supervisor)		10	10 %	d1, d3, d4
3	Reporting (assessed by the supervisor)		10	10 %	c9
4	Training assignments accomplishment (assessed by the supervisor)		20	20 %	c3, c4, d1, d5
5	Final Committee exam * : Oral exam		50	50 %	c3, c4, c5, c6, c7, c8, c9
TOTAL			100	100 %	

\* : A committee of three of the teaching staff including the supervisor of the training.

The marks of the committee exam is divided as follows:

Item	Mark
supervisor	10

Committee member 1	20
Committee member 1	20

### **General Rule**

- The student should provide a signed letter form the from the community pharmacy where he has practiced. The letters shall confirm the student`s appropriate attendance, behavior and number hours of practice. No student will be allowed to enter the final exam without such letters.

<b>VIII. Learning Resources:</b>	
<b>1- Required Textbook(s) ( maximum two ).</b>	
<ol style="list-style-type: none"> <li>1. Lillian M Azzopardi. Lecture notes on pharmacy practice, 2010, Pharmaceutical press.Christopher</li> <li>2. A Langley, Dawn Belcher. Applied pharmaceutical skills, 2009, Pharmaceutical press.</li> </ol>	
<b>2- Essential References.</b>	
<ol style="list-style-type: none"> <li>1. Agarwal. Dispensing and community pharmacy</li> <li>2. Jain. A text book of professional pharmacy</li> </ol>	
<b>3- Electronic Materials and Web Sites etc.</b>	
www.en.wikipedia.org/	

<b>IX.Course Policies:</b>	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student.

	Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of PHARMACY TRAINING II

<b>I. - Information about Faculty Member Responsible for the Course:</b>							
<b>Name of Faculty Member</b>		<b>Office Hours</b>					
<b>Location &amp; Telephone No.</b>	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
<b>E-mail</b>							

<b>II. Course Description:</b>
<p>This is a field training course designed to allow students to apply their knowledge and skills in the real world. The course is complementary to "Pharmacy Training I " course and concerns with training in community pharmacies.</p>

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	<b>C2</b>	<b>c3 .</b> Administer community pharmacy effectively and efficiently.
2.		<b>c4.</b> Provide the service of counseling to patients in community pharmacies.

3.		c5. Dispense drug products effectively in community pharmacies.
4.		c6. Select appropriate Over The Counter "OTC" drug products to treat minor disorders of patients.
5.		c7 .Store and arrange dug products in community pharmacies using standard procedures.
6.		c8. Practice pharmacy-related documentation.
7.	C4	c9. Present and report his/her works correctly using appropriate writing rules and technologies media.
8.	D1	d1. Share successfully in team-work.
9.	D2	d2. Show respect to life and commit to community and patients serving.
10.	D3	d3. Communicate effectively with his/her colleagues and patients.
11.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
12.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c3, c4 , c5, c6, c7, c8	Field training	Field training assessment
c9	Field training	Field training assessment

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Field training , Group-projects	Field training assessment
d2	Field training	Field training assessment
d5	Field training	Field training assessment

IV. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Drug products arrangement and Storage</b>	c7, d1, d2, d3, d4, d5	<ul style="list-style-type: none"> <li>• Arrangement of drug products in community pharmacy</li> <li>• Application the specific storage conditions for drug products</li> <li>• Reporting of types of dug products in the pharmacy</li> </ul>	1 - 5 <sup>th</sup> week	70

2	<b>Skills of dispensing</b>	c5, d1, d2, d3, d4, d5	<ul style="list-style-type: none"> <li>• Application of Dispensing regulations</li> <li>• Medical prescriptions and interpretation</li> <li>• Dispensing of controlled drugs</li> </ul>	6 <sup>th</sup> week – 8 <sup>th</sup> week	40
	<b>skills of Patients counseling services &amp; drug information</b>	c4, c6 d1, d2, d3, d4, d5	<ul style="list-style-type: none"> <li>• Skills of communication with patients</li> <li>• Responding to patients questions</li> <li>• Counseling related to Drug products use</li> <li>• Recommendation of OTC products</li> <li>• Drug indexes : types, how to use</li> </ul>	9 <sup>th</sup> week – 11 <sup>th</sup> week	50
	<b>Pharmacy management</b>	c3, c8 d1, d2, d3, d4, d5	<ul style="list-style-type: none"> <li>• Employments leadership</li> <li>• Sale &amp; purchasing skills</li> <li>• Ordering of drug products</li> <li>• Documentation</li> <li>• Financial tasks.</li> </ul>	12 <sup>th</sup> week – 15 <sup>th</sup> week	90
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	250 contact hours equivalent to 2 credit hours
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	2 Units

## V. Teaching strategies of the course:

**Field training:** each 2-3 students are commissioned to do certain assignments in a real field entity such as drug factory, hospitals, pharmacies under supervision of both the field principle and an academic supervisor

VI. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : each student is assigned to provide a tabulated list of drug products in the pharmacy. The table should include : generic name, trade, dosage form, strength manufacturer, country , local agent and drugs are pharmacologically indexed.	c3, d5	1- 14 th week	14
2	<b>Group</b> : the group will be assigned to provide a number ( 5-8) cases of patient counseling they have encountered during their practicing training in the pharmacies	c4, d1	1- 14 th week	6

VII. Schedule of Assessment Tasks for Students During the Semester					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance ( assessed by the supervisor)		10	10 %	c3, c4, c5, c6, c7, c8, c9, d1, d2, d3, d4, d5
2	Attitude (assessed by the supervisor)		10	10 %	d1, d3, d4
3	Reporting (assessed by the supervisor)		10	10 %	c9
4	Training assignments accomplishment (assessed by the supervisor)		20	20 %	c3, c4, d1, d5
5	Final Committee exam * : Oral exam		50	50 %	c3, c4, c5, c6, c7, c8, c9
TOTAL			100	100 %	

\* : A committee of three of the teaching staff including the supervisor of the training.

The marks of the committee exam is divided as follows:

Item	Mark
supervisor	10



Committee member 1	20
Committee member 1	20

### **General Rule**

- The student should provide a signed letter form the from the community pharmacy where he has practiced. The letters shall confirm the student`s appropriate attendance, behavior and number hours of practice. No student will be allowed to enter the final exam without such letters.

<b>IX. Learning Resources:</b>	
<b>1- Required Textbook(s) ( maximum two ).</b>	
3. Lillian M Azzopardi. Lecture notes on pharmacy practice, 2010, Pharmaceutical press.Christopher	
4. A Langley, Dawn Belcher. Applied pharmaceutical skills, 2009, Pharmaceutical press.	
<b>2- Essential References.</b>	
3. Agarwal. Dispensing and community pharmacy	
4. Jain. A text book of professional pharmacy	
<b>3- Electronic Materials and Web Sites etc.</b>	
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>	

<b>X. Course Policies:</b>	
5.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student.

	Otherwise, he/she will not be allowed to attend the final exam
6.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
7.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
8.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### BIOSTATSTICS

I.		II. Course Identification and General Information:					
1.	Course Title:	BIOSTATSTICS					
2.	Course Code & Number:	MSC 11					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		1	1	-	-		-
4.	Study level/ semester at which this course is offered:	( FIFTH ) Year – ( 1 <sup>ST</sup> ) semester					
5.	Pre –requisite (if any):	• Mathematics					
6.	Co –requisite (if any):	NONE					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10.	Prepared By:						
11.	Date of Approval	10/2014					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

III. Course Description:
<p>The course deals study of the basic statistical calculations applied in pharmaceutical works and researches</p>

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A3	a1. Discuss the basic statistical principles commonly encountered during his/her pharmacy study and at practicing the profession.
2.	B1	b1. Interpret the graphical and numerical statistical parameters.
3.	B2	b2 .Solve statistics related problems.
4.	B3	b3 .Extract related statistical equations from graphs.
5.	B4	b4. Select the most appropriate statistical method to demonstrate or interpret data.
6.	C1	c1. Operate and use scientific calculator correctly.
7.	C2	c2 .Apply equations and rules to solve statistical problems
8.	D1	d1. Share successfully in team-work.
9.	D5	d2. Demonstrate time management during solving mathematical problems

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture-discussion,, feed-back learning,	written exam

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	feed-back learning, Group-project.	Written exam
b2	Lecture-discussion , feed-back learning	written exam , quizzes, assignment
b3	Lecture-discussion, feed-back learning	written exam

b4	Lecture-discussion	written exam , quiz
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
c1	Lecture-discussion	Written exam
c2	Feed-back learning	Written exam
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
d1	Lecture-discussion	Assignment
d2	Lecture-discussion	Quiz

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, b1, b2, b3, b4, c1, c2	definition and significant of statistics, types of data, interval scale data, ordinal scale data, nominal scale data	1	2
2	<b>Descriptive statistics</b>	a1, b1, b2, b3, b4, c1, c2	mean, mode, median, standard deviation, variance, coefficient of variation, with solving problems	4	8
3	<b>Normal distribution</b>	a1, b1, b2, b3, b4, c1, c2	definition, interpretation, solving problems	1	2
4	<b>Sampling</b>	a1, b1, b2, b3, b4, c1, c2	definition of population, samples, methods of sampling, with solving problems	1	2
<b>MID-TERM EXAM</b>				1	2
5	<b>95 % confidence interval</b>	a1, b1, b2, b3, b4, c1, c2	Definition, significance, applications, solving problems	1	2
6	<b>Comparative statistics</b>	a1, b1, b2, b3, b4, c1, c2	<ul style="list-style-type: none"> <li>• F-test : P-value , significance of differences in variances between two sets of data, , with solving problems</li> <li>• Student-t test : P-value, significance of differences in means between two sets of data , one-sided test, two-sided test, assuming equal variance, assuming unequal variance, with solving problems</li> <li>• ANOVA : P-value, significance of</li> </ul>	4	8

			differences in variances between more than two sets of data , single-factor test, two-factors with replication test, two-factors without replication test <ul style="list-style-type: none"> <li>Chi-square test : compare the differences in categorized data</li> </ul>		
7	<b>Application of Computer programs in statistics</b>	a1, b1, b2, b3, b4, c1, c2	<ul style="list-style-type: none"> <li>SPSS</li> <li>Microsoft excel</li> <li>others</li> </ul>	2	4
	<b>Course Review</b>	a1, b2, b3, b4, c1,c2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	3 Units

## V. Teaching strategies of the course:

**lecture - Discussion:** a short lecture/ address followed by discussion

**Seminars:** these are mainly used with small groups of students (20-30) students in which they find better chances for discussing and participating in the teaching process.

**Feed-back learning:** students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve statistical problems during Tutorial at the class .	a1, b2, b4, c1, d2	4-13	6
2	<b>Group :</b> each group of students will be assigned to solve statistical problems during as homework	a1, b2, b4, c1, d1	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, b2, b4, c1,c2, d1, d2
2	Assignments (1 + 2)	4-13, 14	10	10	a1, b2, b4, c1, d1, d2
3	Quiz 1 + Quiz 2	7, 12	5	5	c1, b4
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, b1, b2, b3, b4, c1
5	Final exam of theoretical part ( written exam)	17	60	60	a1, b2, b3, b4, c1,c2
TOTAL			100	100 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Philip Rowe. Essential statistics for the pharmaceutical sciences, 2007 John Wiley & Sons Ltd.

### 2- Essential References.

1. Arun Bhadra Khanal. Methods in Biostatistics For Medical students and Research workers
2. Singh. Biostatistics and introductory calculus

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



<b>IX. Course Policies:</b>	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of BIOSTATSTICS

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

IV. Course Description:
The course deals study of the basic statistical calculations applied in pharmaceutical works and researches

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 3. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A3	a1. Discuss the basic statistical principles commonly encountered during his/her pharmacy study and at practicing the profession.
2.	B1	b1. Interpret the graphical and numerical statistical parameters.
3.	B2	b2 .Solve statistics related problems.
4.	B3	b3 .Extract related statistical equations from graphs.
5.	B4	b4. Select the most appropriate statistical method to demonstrate or interpret data.
6.	C1	c1. Operate and use scientific calculator correctly.
7.	C2	c2 .Apply equations and rules to solve statistical problems
8.	D1	d1. Share successfully in team-work.
9.	D5	d2. Demonstrate time management during solving mathematical problems

#### 4. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture-discussion,, feed-back learning,	written exam

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	feed-back learning, Group-project.	Written exam
b2	Lecture-discussion , feed-back learning	written exam , quizzes, assignment
b3	Lecture-discussion, feed-back learning	written exam

b4	Lecture-discussion	written exam , quiz
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
c1	Lecture-discussion	Written exam
c2	Feed-back learning	Written exam
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
d1	Lecture-discussion	Assignment
d2	Lecture-discussion	Quiz

## V. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, b1, b2, b3, b4, c1, c2	definition and significant of statistics, types of data, interval scale data, ordinal scale data, nominal scale data	1	2
2	<b>Descriptive statistics</b>	a1, b1, b2, b3, b4, c1, c2	mean, mode, median, standard deviation, variance, coefficient of variation, with solving problems	4	8
3	<b>Normal distribution</b>	a1, b1, b2, b3, b4, c1, c2	definition, interpretation, solving problems	1	2
4	<b>Sampling</b>	a1, b1, b2, b3, b4, c1, c2	definition of population, samples, methods of sampling, with solving problems	1	2
<b>MID-TERM EXAM</b>				1	2
5	<b>95 % confidence interval</b>	a1, b1, b2, b3, b4, c1, c2	Definition, significance, applications, solving problems	1	2
6	<b>Comparative statistics</b>	a1, b1, b2, b3, b4, c1, c2	<ul style="list-style-type: none"> <li>• F-test : P-value , significance of differences in variances between two sets of data, , with solving problems</li> <li>• Student-t test : P-value, significance of differences in means between two sets of data , one-sided test, two-sided test, assuming equal variance, assuming unequal variance, with solving problems</li> <li>• ANOVA : P-value, significance of</li> </ul>	4	8

			differences in variances between more than two sets of data , single-factor test, two-factors with replication test, two-factors without replication test <ul style="list-style-type: none"> <li>• Chi-square test : compare the differences in categorized data</li> </ul>		
7	<b>Application of Computer programs in statistics</b>	a1, b1, b2, b3, b4, c1, c2	<ul style="list-style-type: none"> <li>• SPSS</li> <li>• Microsoft excel</li> <li>• others</li> </ul>	2	4
	<b>Course Review</b>	a1, b2, b3, b4, c1,c2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	3 Units

## VI. Teaching strategies of the course:

**lecture - Discussion:** a short lecture/ address followed by discussion

**Seminars:** these are mainly used with small groups of students (20-30) students in which they find better chances for discussing and participating in the teaching process.

**Feed-back learning:** students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VII. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve statistical problems during Tutorial at the class .	a1, b2, b4, c1, d2	4-13	6
2	<b>Group :</b> each group of students will be assigned to solve statistical problems during as homework	a1, b2, b4, c1, d1	14	4

### VIII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, b2, b4, c1,c2, d1, d2
2	Assignments (1 + 2)	4-13, 14	10	10	a1, b2, b4, c1, d1, d2
3	Quiz 1 + Quiz 2	7, 12	5	5	c1, b4
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, b1, b2, b3, b4, c1
5	Final exam of theoretical part ( written exam)	17	60	60	a1, b2, b3, b4, c1,c2
TOTAL			100	100 %	

### IX. Learning Resources:

#### 1- Required Textbook(s) ( maximum two ).

1. Philip Rowe. Essential statistics for the pharmaceutical sciences, 2007 John Wiley & Sons Ltd.

#### 2- Essential References.

2. Arun Bhadra Khanal. Methods in Biostatistics For Medical students and Research workers
3. Singh. Biostatistics and introductory calculus

#### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

<b>X. Course Policies:</b>	
5.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
6.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
7.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
8.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### PHARMACEUTICAL BIOTECHNOLOGY

I. Course Identification and General Information:							
1.	Course Title:	PHARMACEUTICAL BIOTECHNOLOGY					
2.	Course Code & Number:	PHRT 19					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( FIFTH ) Year – ( 1 <sup>ST</sup> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>• Introduction to pharmacy profession</li> <li>• Drug discovery &amp; development</li> <li>• Pharmaceutics I, II &amp; III</li> <li>• Pharmacology I, II, III</li> <li>• Experimental pharmacology</li> <li>• General biology</li> <li>• Organic chemistry</li> <li>• Medical biochemistry</li> <li>• Pharmaceutical microbiology</li> </ul>					
6.	Co –requisite (if any):						
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10.	Prepared By:						
11.	Date of Approval	10/2014					

### II. Course Description:

The course deals with the study of principles & techniques of advance biotechnology and the drugs produced by those techniques.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A1	a1. Identify the various types and characteristics of living organisms used to produce biotechnology drugs.
2.	A2	a2. Determine the physical, chemical and pharmacological properties of biotechnology-produced drugs.
3.	A3	a3. Define biotechnology and recognize its main purposes and techniques.
4.		a4. Explicit the pharmaceutical applications of biotechnology.
5.	A4	a5. Comprehend his/her role as a pharmacist in developing and employing biotechnology techniques in pharmacy practice.
6.	B1	b1. Interpret symbols and abbreviations related to biotechnology.
7.	B2	b2. Classify biotechnology techniques and drugs.
8.		b3. Compare between classical drugs & biotechnology-produced drugs and also between various types of biotechnology techniques.
9.	B4	b4. Assess the advantages and disadvantages of biotechnology-produced drugs.
10.		b5. Select appropriate biotechnology techniques to produce drugs.
11.	C4	c1. Search efficiently for information using documented and electronic sources of information.
12.		c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
13.	D1	d1. Share successfully in team-work.
14.	D2	d2. Show respect to life and commit to community and patients serving.
15.	D3	d3. Communicate effectively with his/her colleagues.
16.	D5	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge&amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a6 , a3, a4, a5	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b1, b3, b4, b5	Lecture , Feed-back learning	Written exam , Attendance , Assignments , quizzes
<b>(c)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 , c2	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d4	Feed-back learning	Assignments

IV. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to Biotechnology</b>	a1, a3, a5, b1, d2	<ul style="list-style-type: none"> <li>definition &amp; purposes &amp; brief history.</li> <li>Relation of biotechnology to advancement in intracellular chemistry, molecular biology, rDNA technology, pharmacogenomics and immunopharmacology,</li> <li>living organisms used in biotechnology</li> <li>advantage and disadvantages of biotechnology drug products as compared to classical medications</li> </ul>	2	4
2	<b>Techniques of Biotechnology</b>	a4, a5, b1, b1, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>Classification of biotechnology techniques</li> <li>Principles, equipments, pharmaceutical applications, comparison, advantages and disadvantages of :               <ul style="list-style-type: none"> <li>recombinant DNA (rDNA).</li> <li>Monoclonal antibodies</li> <li>Polymerase chain Reaction (PCR)</li> <li>Nucleotide blockade/antisense</li> <li>Peptide technology</li> </ul> </li> </ul>	4	8
<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> <li>Post-exam disussion</li> </ul>				1	2
3	<b>biotechnology produced-Drugs</b>	a2, a4, a5, b1, b3, b4, d2	<ul style="list-style-type: none"> <li>Classification of biotechnology drugs</li> <li>Proteins as the first biotechnology products of biotechnology</li> <li>Physicochemical properties, Indication, mechanism of action, dose, route of administration, precautions, biotechnology by which is obtained for the following</li> </ul>	7	14

			products, : <ul style="list-style-type: none"> <li>○ Anticoagulant drug: Lepirudin (Refludan) ®</li> <li>○ Antisense drugs : Fomivirsen sodium (Vitravene), efavirenz (Sustiva)®</li> <li>○ Clotting factors : Systemic antihemophilic factors (Kogenate) ®</li> <li>○ colony-stimulating factors: granulocyte colony–stimulating factor (Filgrastim)®</li> <li>○ Erythropoietins : Epoetin alfa (Epogen, Procrit) ®</li> <li>○ Fusion inhibitors: Enfuvirtide (Fuzeon) ®</li> <li>○ Growth factor: becaplermin (Regranex) ®</li> <li>○ Human growth hormone: ystemic growth hormone (Humatrope, protropin) ®</li> <li>○ Interferons: interferon beta-1b (betaseron), interferon beta-1a (Avonex) ®</li> <li>○ Interleukins: Aldesleukin (Proleukin) ®</li> <li>○ tissue plasminogen activators: recombinant Alteplase (Activase) ®</li> <li>○ Vaccines: hepatitis B vaccine recombinant (Engerix-b) ®, haemophilus B conjugate vaccine (Hibtiter) ®</li> </ul>		
<b>Course Review</b>	a1, a2, a3, a4, a5, b1, b1, b3, b4, b5 , d2	Review of the course topics by discussion session.	1	2	
<b>FINAL - EXAM</b>			1	2	
<b>TOTAL</b>			16	32	
<b>Number of Weeks /and Units Per Semester</b>			16 weeks	3 Units	

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report on one drug produced by biotechnology.	a2, d4	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report on one recent advances in one biotechnology techniques	a3, d1, d3, d4	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, b1, b3, b4, b5
2	Assignments (1 + 2)	4, 14	10	10	b4, c1, c2, d1, d3, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b3, b5
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, , a3, a4, a5, b1, b1, b3, b4, b5, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a2, a6, a3, a4, a5, b1, b2, b1, b4, b1, b3, b7, b8, b9, b9, b4, b5, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA: Chapter: Biotechnology

### 2- Essential References.

2. Nagori. Foundations in pharmaceutical biotechnology
3. R.S. pharmaceutical biotechnology

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

### IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of

## PHARMACEUTICAL BIOTECHNOLOGY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

### II. Course Description:

The course deals with the study of principles & techniques of advance biotechnology and the drugs produced by those techniques.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>3. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
17.	A1	a1. Identify the various types and characteristics of living organisms used to produce biotechnology drugs.
18.	A2	a2. Determine the physical, chemical and pharmacological properties of biotechnology-produced drugs.
19.	A3	a3. Define biotechnology and recognize its main purposes and techniques.
20.		a4. Explicit the pharmaceutical applications of biotechnology.
21.	A4	a5. Comprehend his/her role as a pharmacist in developing and employing biotechnology techniques in pharmacy practice.
22.	B1	b1. Interpret symbols and abbreviations related to biotechnology.
23.	B2	b2. Classify biotechnology techniques and drugs.
24.		b3. Compare between classical drugs & biotechnology-produced drugs and also between various types of biotechnology techniques.
25.	B4	b4. Assess the advantages and disadvantages of biotechnology-produced drugs.
26.		b5. Select appropriate biotechnology techniques to produce drugs.
27.	C4	c1. Search efficiently for information using documented and electronic sources of information.
28.		c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
29.	D1	d1. Share successfully in team-work.
30.	D2	d2. Show respect to life and commit to community and patients serving.
31.	D3	d3. Communicate effectively with his/her colleagues.
32.	D5	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>4. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a6 , a3, a4, a5	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b1, b3, b4, b5	Lecture , Feed-back learning	Written exam , Attendance , Assignments , quizzes
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 , c2	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d4	Feed-back learning	Assignments

IV. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to Biotechnology</b>	a1, a3, a5, b1, d2	<ul style="list-style-type: none"> <li>definition &amp; purposes &amp; brief history.</li> <li>Relation of biotechnology to advancement in intracellular chemistry, molecular biology, rDNA technology, pharmacogenomics and immunopharmacology,</li> <li>living organisms used in biotechnology</li> <li>advantage and disadvantages of biotechnology drug products as compared to classical medications</li> </ul>	2	4
2	<b>Techniques of Biotechnology</b>	a4, a5, b1, b1, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>Classification of biotechnology techniques</li> <li>Principles, equipments, pharmaceutical applications, comparison, advantages and disadvantages of :               <ul style="list-style-type: none"> <li>recombinant DNA (rDNA).</li> <li>Monoclonal antibodies</li> <li>Polymerase chain Reaction (PCR)</li> <li>Nucleotide blockade/antisense</li> <li>Peptide technology</li> </ul> </li> </ul>	4	8
<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> <li>Post-exam disussion</li> </ul>				1	2
3	<b>biotechnology produced-Drugs</b>	a2, a4, a5, b1, b3, b4, d2	<ul style="list-style-type: none"> <li>Classification of biotechnology drugs</li> <li>Proteins as the first biotechnology products of biotechnology</li> <li>Physicochemical properties, Indication, mechanism of action, dose, route of administration, precautions, biotechnology by which</li> </ul>	7	

			<p>is obtained for the following products, :</p> <ul style="list-style-type: none"> <li>○ Anticoagulant drug: Lepirudin (Refludan) ®</li> <li>○ Antisense drugs : Fomivirsen sodium (Vitravene), efavirenz (Sustiva)®</li> <li>○ Clotting factors : Systemic antihemophilic factors (Kogenate) ®</li> <li>○ colony-stimulating factors: granulocyte colony–stimulating factor (Filgrastim)®</li> <li>○ Erythropoietins : Epoetin alfa (Epogen, Procrit) ®</li> <li>○ Fusion inhibitors: Enfuvirtide (Fuzeon) ®</li> <li>○ Growth factor: becaplermin (Regranex) ®</li> <li>○ Human growth hormone: ystemic growth hormone (Humatrope, protropin) ®</li> <li>○ Interferons: interferon beta-1b (betaseron), interferon beta-1a (Avonex) ®</li> <li>○ Interleukins: Aldesleukin (Proleukin) ®</li> <li>○ tissue plasminogen activators: recombinant Alteplase (Activase) ®</li> <li>○ Vaccines: hepatitis B vaccine recombinant (Engerix-b) ®, haemophilus B conjugate vaccine (Hibtiter) ®</li> </ul>		14
<b>Course Review</b>	a1, a2, a3, a4, a5, b1, b1, b3, b4, b5 , d2	Review of the course topics by discussion session.	1	2	
<b>FINAL - EXAM</b>			1	2	
<b>TOTAL</b>			16	32	
<b>Number of Weeks /and Units Per Semester</b>			16 weeks	3	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report on one drug produced by biotechnology.	a2, d4	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report on one recent advances in one biotechnology techniques	a3, d1, d3, d4	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, b1, b3, b4, b5
2	Assignments (1 + 2)	4, 14	10	10	b4, c1, c2, d1, d3, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b3, b5
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, , a3, a4, a5, b1, b1, b3, b4, b5, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a2, a6, a3, a4, a5, b1, b2, b1, b4, b1, b3, b7, b8, b9, b9, b4, b5, d2
<b>TOTAL</b>			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Ansel`s Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA: Chapter: Biotechnology

### 2- Essential References.

1. Nagori. Foundation s in pharmaceutical biotechnology
2. R.S. pharmaceutical biotechnology

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

<b>X. Course Policies:</b>	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### APPLIED PHARMACOLOGY

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	PHYTOCHEMISTRY I					
2.	Course Code & Number:	PHRG 07					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( <i>THIRD</i> ) Year – ( <i>2<sup>ND</sup></i> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General biology</li> <li>Botany</li> <li>General chemistry</li> <li>Organic chemistry</li> <li>Pharmaceutical organic chemistry</li> <li>Pharmacognosy I , II</li> <li>Phytochemistry I &amp; II</li> </ul>					
6.	Co –requisite (if any):	none					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the applications of advance instrumental analysis in phytochemicals and herbal medicine .

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Determine the botanical source and therapeutic uses of alkaloids and terpenoids phytochemicals.
2.	A2	a2. Determine the physicochemical properties of alkaloids and terpenoids phytochemicals.
3.	A3	a3. Discuss the methods and techniques used to extract and isolate phytochemicals
4.	A4	a4. Comprehend his/her role as a pharmacist in extraction, isolation and identification of phytochemicals.
5.	B1	b1. Express the chemical structure of phytochemicals using drawings.
6.		b2. Differentiate between various types of alkaloids and terpenoids.
7.		b3. Solve problems related to nomenclature, identification and differentiation of phytochemicals.
8.	B2	b4 .Classify alkaloids and terpenoids chemically and therapeutically
9.		b5. Compare between methods of extraction and isolation of phytochemicals based on their applications and efficiencies.
10.	B3	b6. Predict the outcomes of chemical reactions of alkaloids and terpenoids.
11.	B3	b7. Select the most appropriate technique for extraction and isolation of phytochemicals.
12.	C1	c1.Handle efficiently the tools and chemicals used in phytochemistry Lab.
13.		c2. Operate successfully the instruments used in phytochemistry Lab.
14.	C2	c3 . Perform effectively the experiments , practical tasks including extraction, identification and isolation of phytochemicals using standard procedures.
15.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.
16.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
17.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.

18.	D1	d1. Share successfully in team-work.
19.	D2	d2. Show respect to life.
20.	D3	d3. Communicate effectively with his/her colleagues.
21.	D4	d4. Behave in discipline during practicing practical and professional works and assignments.
22.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

2. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2	lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
a3	Lecture	Written exam , Attendance
a4	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture , feed-back learning laboratory practice	Written exam , Attendance, quizzes Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b4, b5	Lecture	Written exam , Attendance
b6	Lecture , feed-back learning	Written exam , Attendance,

		assignment, quizzes
b7	Lecture	Written exam , Attendance
<b>(C) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d3, d4	laboratory practice	Practical assessment (Lab. attendance, attitude, practical exam)
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice	Practical assessment (Lab. attendance, accomplishment, practical exam)
d5	Feed-back learning	Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Applications of spectoscopy in phytochemical analysis</b>	a2, a4 , b1, d2	<input type="checkbox"/> Definition, brief history, types (conventional, medicinal) <input type="checkbox"/> Scope of medicinal phytochemistry <input type="checkbox"/> Phytochemicals : Definition , evolution process, clarification, chemical classification , physicochemical properties	1	2
2	<b>Applications of chromatographic techniques in phytochemical analysis</b>	a3, a4, b7, d2	<b>Extraction techniques</b> <input type="checkbox"/> Maceration, percolation, soxhlet extractor: principle, apparatus, applications <input type="checkbox"/> Spouted bed extraction <input type="checkbox"/> Superficial fluid extraction <input type="checkbox"/> Solid-phase microextraction	2	4
3	<b>Separation and isolation of phytochemicals</b>	a3, b5, b7, d2	<b>Sublimation , Distillation , Fractional liberation , Fractional crystallization :</b> principle, apparatus, applications <input type="checkbox"/> <b>Chromatography</b> <input type="checkbox"/> principle, brief history, types and selection of stationary phase and mobile phase, general factors affecting separation <input type="checkbox"/> <b>adsorption chromatography: Thin layer chromatography</b> <input type="checkbox"/> principle and procedures <input type="checkbox"/> applications <input type="checkbox"/> preparative TLC <input type="checkbox"/> illustrative examples of phytochemicals isolated by TLC <input type="checkbox"/> <b>partition chromatography: Paper chromatography:</b> principle , procedures and application <input type="checkbox"/> <b>High performance liquid chromatography (HPLC) :</b> principle, equipment (pressure system, injector, column and stationary phase, mobile	3	6

			<p>phase, flow rate), illustrative examples of phytochemicals isolated by HPLC</p> <ul style="list-style-type: none"> <li>□ <b>Counter-current extraction</b> : principle, types (High-speed, droplet), apparatus, applications</li> <li>□ <b>Gas liquid chromatography:</b> : principle, equipment (pressure system, injector, column and stationary phase, mobile phase, flow rate), illustrative examples of phytochemicals isolated.</li> <li>□ <b>Capillary-column gas chromatography:</b> : principle, equipment (pressure system, injector, column and stationary phase, mobile phase, flow rate), illustrative examples of phytochemicals isolated .</li> <li>□ <b>Gel filtration technique</b> principle , equipment, procedures and application</li> <li>□ <b>Electrochromatography</b></li> </ul>		
MID-TERM EXAM				1	2
4	<b>Alkaloids</b>	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2	<p>Introduction:definition,history,occurrence ,classification,nomenclature,physical and chemical properties,isolation,purification and detection.</p> <ul style="list-style-type: none"> <li>□ Phenylalkylamine alkaloids (ephedrine, cathinone and capsaicinoide)</li> <li>□ Isochinolin alkaloids(papaverine, morphine,codeine and emetine)</li> <li>□ Tropolon alkaloids(colchicines and demecolcine)</li> <li>□ Amaryllidaceen alkaloids(lycorine and galanthamin)</li> <li>□ Alkaloids derived from tryptophan</li> <li>□ Indol-alkaloids(physostigmine,carboline,ergoli ne,ajmalicine,yohimbine, ajmaline and strychnine type)</li> <li>□ Chinoline alkaloids(cinchona alkaloids)</li> <li>□ Alkaloids derived from histidine: (pilocarpine,isopilocarpine and pilosine)</li> <li>□ Alkaloids derived from asparagic acid :(ricinine and nicotine alkaloids)</li> </ul>	4	8

			<ul style="list-style-type: none"> <li><input type="checkbox"/> Alkaloids derived from lysine piperidine alkaloids(piper,lobelia and pomegranate alkaloids)</li> <li><input type="checkbox"/> chinolizidine alkaloids(lupinine,sparteine and cytosine)</li> <li><input type="checkbox"/> Alkaloids derived from ornithine:tropan alkaloids(atropine, hyoscyamine , scopolamine and cocaine)chinazoline alkaloids(tetradoxine)</li> <li><input type="checkbox"/> Alkaloids derived from glycine:purine alkaloids (caffeine,theophylline and theobromine)terpen alkaloids(monoterpen,sesquiterpen and diterpen alkaloids)</li> </ul>		
5	<b>Terpenoids</b>	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2	<ul style="list-style-type: none"> <li><input type="checkbox"/> Introduction (definition,classification,biosynthesis and distribution)</li> <li><input type="checkbox"/> Monoterpens (regular and irregular monoterpenoids,iridoids,structures,chemical and physical properties and drugs containing monoterpenoids)</li> <li><input type="checkbox"/> Sequiterpens and sequiterpens lactones(structures,chemical and biological properties and drug containing sequiterpens and sequiterpens lactones)</li> <li><input type="checkbox"/> Diterpenes( structures,chemical and biological properties and drug containing diterpenes)</li> <li><input type="checkbox"/> Triterpenes(classification,structures and drug containing triterpenes)</li> <li>Tetraterpenes(chemical and biological properties,vitamin A and drug containing tetraterpenes).</li> </ul>	3	6
	<b>Course Review</b>	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2

<b>TOTAL</b>	16	32
<b>Number of Weeks /and Units Per Semester</b>	16 weeks	5 Units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Intended Learning Outcomes CILOs</b>
physicochemical properties , extraction (maceration or percolation or soxhlet extraction ) , concentration (if necessary " rotary evaporation', isolation (Thin layer chromatography) and identification of the phytochemicals from crude drugs or parts of medicinal plants				
1.	alkaloids (Caffeine )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
2.	alkaloids (Theophylline)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
3.	alkaloids (cathinone)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
4.	alkaloids ( <u>Trigonelline</u> )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
5.	alkaloids ( <u>vincristine</u> )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
6.	alkaloids (Capsaicin)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
7.	Terpenoids : ( Prenol)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
8.	Terpenoids : ( Eucalytol)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
9.	Terpenoids : ( Retinol)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
10.	Terpenoids : ( squalane )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
11.	Review		2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	



<b>Total</b>	12	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>		<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : each student will be assigned solve the problems provided by the teacher. The problems involve nomenclature, isolation , chemical reaction, etc.	b3, b6., c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to present 2-3 videos or simulations of one of the studied extraction , isolation techniques.	c5, c6, d1, d3, d5	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2
2	Assignments (1 + 2)	4, 14	5	5	b3, b6, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	3	3	b2, b3, b6
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a2, a3, a4 , b1, b5 b7, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
6	Practical exam (practical)	14	20	20	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
Total			40	40 %	

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. W.C. Evans, Trease and Evans pharmacognosy, 2009, W.B.Saunders 2. Amritpal Singh Saroya, Herbalism, Phytochemistry and Ethnopharmacology, 2011, CRC press Jarald.
<b>2- Essential References.</b>
3. Bhandari. Textbook of pharmacognosy
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of PHYTOCHEMISTRY I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

### II. Course Description:

The course deals with the study of physicochemical properties, extraction, isolation and identification of active chemical constituents (phytochemicals) obtained from medicinal plants in particular alkaloids and terpenoids.

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
3. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A1	a1. Determine the botanical source and therapeutic uses of alkaloids and terpenoids phytochemicals.
2.	A2	a2. Determine the physicochemical properties of alkaloids and terpenoids phytochemicals.
3.	A3	a3. Discuss the methods and techniques used to extract and isolate phytochemicals
4.	A4	a4. Comprehend his/her role as a pharmacist in extraction, isolation and identification of phytochemicals.
5.	B1	b1. Express the chemical structure of phytochemicals using drawings.
6.		b2. Differentiate between various types of alkaloids and terpenoids.
7.		b3. Solve problems related to nomenclature, identification and differentiation of phytochemicals.
8.	B2	b4 .Classify alkaloids and terpenoids chemically and therapeutically
9.		b5. Compare between methods of extraction and isolation of phytochemicals based on their applications and efficiencies.
10.	B3	b6. Predict the outcomes of chemical reactions of alkaloids and terpenoids.
11.	B3	b7. Select the most appropriate technique for extraction and isolation of phytochemicals.
12.	C1	c1.Handle efficiently the tools and chemicals used in phytochemistry Lab.
13.		c2. Operate successfully the instruments used in phytochemistry Lab.
14.	C2	c3 . Perform effectively the experiments , practical tasks including extraction, identification and isolation of phytochemicals using standard procedures.
15.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.
16.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
17.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.

18.	D1	d1. Share successfully in team-work.
19.	D2	d2. Show respect to life.
20.	D3	d3. Communicate effectively with his/her colleagues.
21.	D4	d4. Behave in discipline during practicing practical and professional works and assignments.
22.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

4. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2	lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
a3	Lecture	Written exam , Attendance
a4	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture , feed-back learning laboratory practice	Written exam , Attendance, quizzes Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b4, b5	Lecture	Written exam , Attendance
b6	Lecture , feed-back learning	Written exam , Attendance,

		assignment, quizzes
b7	Lecture	Written exam , Attendance
<b>(C) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d3, d4	laboratory practice	Practical assessment (Lab. attendance, attitude, practical exam)
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice	Practical assessment (Lab. attendance, accomplishment, practical exam)
d5	Feed-back learning	Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to phytochemistry</b>	a2, a4 , b1, d2	<input type="checkbox"/> Definition, brief history, types (conventional, medicinal) <input type="checkbox"/> Scope of medicinal phytochemistry <input type="checkbox"/> Phytochemicals : Definition , evolution process, clarification, chemical classification , physicochemical properties	1	2
2	<b>Extraction of phytochemicals</b>	a3, a4, b7, d2	<b>Extraction techniques</b> <input type="checkbox"/> Maceration, percolation, soxhlet extractor: principle, apparatus, applications <input type="checkbox"/> Spouted bed extraction <input type="checkbox"/> Superficial fluid extraction <input type="checkbox"/> Solid-phase microextraction	2	4
3	<b>Separation and isolation of phytochemicals</b>	a3, b5, b7, d2	<b>Sublimation , Distillation , Fractional liberation , Fractional crystallization :</b> principle, apparatus, applications <input type="checkbox"/> <b>Chromatography</b> <input type="checkbox"/> principle, brief history, types and selection of stationary phase and mobile phase, general factors affecting separation <input type="checkbox"/> <b>adsorption chromatography: Thin layer chromatography</b> <input type="checkbox"/> principle and procedures <input type="checkbox"/> applications <input type="checkbox"/> preparative TLC <input type="checkbox"/> illustrative examples of phytochemicals isolated by TLC <input type="checkbox"/> <b>partition chromatography: Paper chromatography:</b> principle , procedures and application <input type="checkbox"/> <b>High performance liquid chromatography (HPLC) :</b> principle, equipment (pressure system, injector, column and stationary phase, mobile	3	6



			<p>phase, flow rate), illustrative examples of phytochemicals isolated by HPLC</p> <ul style="list-style-type: none"> <li>□ <b>Counter-current extraction</b> : principle, types (High-speed, droplet), apparatus, applications</li> <li>□ <b>Gas liquid chromatography:</b> : principle, equipment (pressure system, injector, column and stationary phase, mobile phase, flow rate), illustrative examples of phytochemicals isolated.</li> <li>□ <b>Capillary-column gas chromatography:</b> : principle, equipment (pressure system, injector, column and stationary phase, mobile phase, flow rate), illustrative examples of phytochemicals isolated .</li> <li>□ <b>Gel filtration technique</b> principle , equipment, procedures and application</li> <li>□ <b>Electrochromatography</b></li> </ul>		
MID-TERM EXAM				1	2
4	<b>Alkaloids</b>	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2	<p>Introduction:definition,history,occurrence ,classification,nomenclature,physical and chemical properties,isolation,purification and detection.</p> <ul style="list-style-type: none"> <li>□ Phenylalkylamine alkaloids (ephedrine, cathinone and capsaicinoide)</li> <li>□ Isochinolin alkaloids(papaverine, morphine,codeine and emetine)</li> <li>□ Tropolon alkaloids(colchicines and demecolcine)</li> <li>□ Amaryllidaceen alkaloids(lycorine and galanthamin)</li> <li>□ Alkaloids derived from tryptophan</li> <li>□ Indol-alkaloids(physostigmine,carboline,ergoli ne,ajmalicine,yohimbine, ajmaline and strychnine type)</li> <li>□ Chinoline alkaloids(cinchona alkaloids)</li> <li>□ Alkaloids derived from histidine: (pilocarpine,isopilocarpine and pilosine)</li> <li>□ Alkaloids derived from asparagic acid :(ricinine and nicotine alkaloids)</li> </ul>	4	8

			<ul style="list-style-type: none"> <li><input type="checkbox"/> Alkaloids derived from lysine piperidine alkaloids(piper,lobelia and pomegranate alkaloids)</li> <li><input type="checkbox"/> chinolizidine alkaloids(lupinine,sparteine and cytosine)</li> <li><input type="checkbox"/> Alkaloids derived from ornithine:tropan alkaloids(atropine, hyoscyamine , scopolamine and cocaine)chinazoline alkaloids(tetradoxine)</li> <li><input type="checkbox"/> Alkaloids derived from glycine:purine alkaloids (caffeine,theophylline and theobromine)terpen alkaloids(monoterpen,sesquiterpen and diterpen alkaloids)</li> </ul>		
5	<b>Terpenoids</b>	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2	<ul style="list-style-type: none"> <li><input type="checkbox"/> Introduction (definition,classification,biosynthesis and distribution)</li> <li><input type="checkbox"/> Monoterpens (regular and irregular monoterpenoids,iridoids,structures,chemical and physical properties and drugs containing monoterpenoids)</li> <li><input type="checkbox"/> Sequiterpens and sequiterpens lactones(structures,chemical and biological properties and drug containing sequiterpens and sequiterpens lactones)</li> <li><input type="checkbox"/> Diterpenes( structures,chemical and biological properties and drug containing diterpenes)</li> <li><input type="checkbox"/> Triterpenes(classification,structures and drug containing triterpenes)</li> <li>Tetraterpenes(chemical and biological properties,vitamin A and drug containing tetraterpenes).</li> </ul>	3	6
	<b>Course Review</b>	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2

<b>TOTAL</b>	16	32
<b>Number of Weeks /and Units Per Semester</b>	16 weeks	5 Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs
physicochemical properties , extraction (maceration or percolation or soxhlet extraction ) , concentration (if necessary " rotary evaporation', isolation (Thin layer chromatography) and identification of the phytochemicals from crude drugs or parts of medicinal plants				
12.	alkaloids (Caffeine )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
13.	alkaloids (Theophylline)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
14.	alkaloids (cathinone)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
15.	alkaloids (Trigonelline)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
16.	alkaloids (vincristine.)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
17.	alkaloids (Capsaicin)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
18.	Terpenoids : ( Prenol)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
19.	Terpenoids : ( Eucalytol)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
20.	Terpenoids : ( Retinol)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
21.	Terpenoids : ( squalane )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
22.	Review		2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : each student will be assigned solve the problems provided by the teacher. The problems involve nomenclature, isolation , chemical reaction, etc.	b3, b6., c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to present 2-3 videos or simulations of one of the studied extraction , isolation techniques.	c5, c6, d1, d3, d5	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2
2	Assignments (1 + 2)	4, 14	5	5	b3, b6, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	3	3	b2, b3, b6
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a2, a3, a4 , b1, b5 b7, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
6	Practical exam (practical)	14	20	20	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
Total			40	40 %	

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
<ol style="list-style-type: none"> <li>1. W.C. Evans, Trease and Evans pharmacognosy, 2009, W.B.Saunders</li> <li>2. Amritpal Singh Saroya, Herbalism, Phytochemistry and Ethnopharmacology, 2011, CRC press Jarald.</li> </ol>
<b>2- Essential References.</b>
<ol style="list-style-type: none"> <li>1. Bhandari. Textbook of pharmacognosy</li> </ol>
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PHARMACOGENOMICS & GENE THERAPY

I. Course Identification and General Information:							
1.	Course Title:	PHARMACOGENOMICS & GENE THERAPY					
2.	Course Code & Number:	PHRC 10					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( FIFTH ) Year – ( 1 <sup>ST</sup> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>• Pharmacology I, II, III</li> <li>• Experimental pharmacology</li> <li>• General biology</li> <li>• Organic chemistry</li> <li>• Medical biochemistry</li> <li>• Pharmaceutical microbiology</li> <li>• Biopharmaceutics</li> <li>• pharmacokinetics</li> </ul>					
6.	Co –requisite (if any):						
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	10/2014					

### II. Course Description:

The course deals with the study of influence of gene on drugs efficacy and toxicity. Moreover, the course also concerns with the principle and applications of gene to treat diseases.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the role of genes in affecting drug disposition in the body.
2.	A2	a2. Determine the types of genes used to treat of diseases.
3.	A3	a3. Define pharmacogenomics and recognize its main purposes and techniques.
4.	A3	a4. Explicit the medical applications of gene therapy
5.	A4	a5. Comprehend his/her role as a pharmacist in recognizing and researching of pharmacogenomics & gene therapy
6.	B1	b1. Interpret symbols and abbreviations related to pharmacogenomics & gene therapy.
7.	B2	b2 .Classify pharmacogenomicstudies and gene therapy techniques.
8.	B2	b3. Compare between types of various types of gene therapy techniques.
9.	B4	b4 . Assess the advantages and disadvantages of pharmacogenomics and gene therapy.
10.	B4	b5. Select appropriate gene therapy techniques to produce drugs.
11.	C4	c1 .Search efficiently for information using documented and electronic sources of information.
12.	C4	c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
13.	D1	d1. Share successfully in team-work.
14.	D2	d2. Show respect to life .
15.	D3	d3. Communicate effectively with his/her colleagues.
16.	D4	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.



<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
a1, a2, a6 , a3, a4, a5	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
b1, b1, b3, b4, b5	Lecture , Feed-back learning	Written exam , Attendance , Assignments , quizzes
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d4	Feed-back learning	Assignments

#### IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to Pharmacogenomics</b>	a1, a3, a5, b1, d2	<ul style="list-style-type: none"> <li>Pharmacogenomics: definitions (pharmacogenetics, pharmacogenomics)</li> <li>Objective of pharmacogenomics</li> <li>History of pharmacogenomics</li> <li>Genetic elements: Human chromosome (definition, structure, types), DNA(definition, structure, function), genes (definition, structure, functions in production of proteins : steps of production : transcription, translation gene expression )</li> <li>Pharmacological proteins (enzymes, hormones, receptors), transporters with examples of each type and the genes responsible for their production)</li> </ul>	2	4
2	<b>Influence of Genetic variations on drugs pharmacokinetics and pharmacodynamics</b>	a4, a5, b1, b1, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>Phenotype: definition, examples</li> <li>Genotypes : definition, type ( wild-alleles, variant alleles), with examples</li> <li>Influence of genetic variation on drug metabolism ( genetic variation in metabolizing enzymes e.g. CYP) with clinical cases of variations</li> <li>Influence of genetic variation on drug efficacy ( genetic variation in drug receptors and on drug transporters) with clinical cases of variations</li> </ul>	3	6
	<b>Pharmacogenomic studies</b>	a4, a5, b1, b1, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>Phenotyping studies : objectives, procedures, examples</li> <li>Genotyping studies: objectives, procedures, examples</li> <li>Adjustment of doses based on pharmacogenomic studies with examples</li> </ul>	2	4

			<ul style="list-style-type: none"> <li>• MID-TERM EXAM</li> <li>• Post-exam disussion</li> </ul>	1	2
3	<b>Introduction to gene therapy</b>	a2, a4, a5, b1, b3, b4, d2	<ul style="list-style-type: none"> <li>○ Definition and brief history</li> <li>○ Stem cells , somatic cells : differences, examples</li> <li>○ Types of gene therapy: germline gene therapy, somatic gene therapy</li> </ul>	2	4
	<b>Gene delivery systems:</b>	a4, a5, b1, b1, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>○ viral vectors: types and techniques with examples</li> <li>○ non-viral vehicles : types and techniques with examples</li> </ul>	2	4
	<b>Application of gene therapy to treat diseases</b>	a4, a5, b1, b1, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>○ Applications of gene therapy to treat CVS diseases : aims and examples</li> <li>○ Applications of gene therapy to treat Alzheimer : aims and examples</li> <li>○ Applications of gene therapy to treat Diabetes : aims and examples</li> <li>○ Other applications</li> <li>○ Limitation and ethical issues of gene therapy</li> </ul>	2	4
	<b>Course Review</b>	a1, a2, a3, a4, a5, b1, b1, b3, b4, b5 , d2	Review of the course topics by discussion session.	1	2
			<b>FINAL - EXAM</b>	1	2
			<b>TOTAL</b>	16	32
			<b>Number of Weeks /and Units Per Semester</b>	16 weeks	3 Units

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report on one pharmacogenetic study.	a2, d4	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report on one recent advances in gene therapy techniques	a3, d1, d3, d4	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, b1, b3, b4, b5
2	Assignments (1 + 2)	4, 14	10	10	b4, c1, c2, d1, d3, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b3, b5
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, , a3, a4, a5, b1, b1, b3, b4, b5, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a2, a6, a3, a4, a5, b1, b2, b1, b4, b1, b3, b7, b8, b9, b9, b4, b5, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Shargel. Biopharmaceutics and pharmacokinetics, 2002, McGraw Hill Inc.

### 2- Essential References.

1. Anthony Meagre. Gene therapy technologies, applications and regulations, 1999 John Wiley & Sons Ltd
2. Connor. Medical genetics

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

### IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of

### PHARMACOGENOMICS & GENE THERAPY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	Pr. Dr. Rashad Al-namer	Office Hours					
Location & Telephone No.	Pharmacy department 774871511	SAT	SUN	MON	TUE	WED	THU
E-mail	yemtiger1@yahoo.com						

### III. Course Description:

The course deals with the study of influence of gene on drugs efficacy and toxicity. Moreover, the course also concerns with the principle and applications of gene to treat diseases.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>3. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A1	a1. Identify the role of genes in affecting drug disposition in the body.
2.	A2	a2. Determine the types of genes used to treat of diseases.
3.	A3	a3. Define pharmacogenomics and recognize its main purposes and techniques.
4.	A3	a4. Explicit the medical applications of gene therapy
5.	A4	a5. Comprehend his/her role as a pharmacist in recognizing and researching of pharmacogenomics & gene therapy
6.	B1	b1. Interpret symbols and abbreviations related to pharmacogenomics & gene therapy.
7.	B2	b2 .Classify pharmacogenomicstudies and gene therapy techniques.
8.	B2	b3. Compare between types of various types of gene therapy techniques.
9.	B4	b4 . Assess the advantages and disadvantages of pharmacogenomics and gene therapy.
10.	B4	b5. Select appropriate gene therapy techniques to produce drugs.
11.	C4	c1 .Search efficiently for information using documented and electronic sources of information.
12.	C4	c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
13.	D1	d1. Share successfully in team-work.
14.	D2	d2. Show respect to life .
15.	D3	d3. Communicate effectively with his/her colleagues.
16.	D4	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.



<b>4. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a6 , a3, a4, a5	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b1, b3, b4, b5	Lecture , Feed-back learning	Written exam , Attendance , Assignments , quizzes
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d4	Feed-back learning	Assignments

## V. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to Pharmacogenomics</b>	a1, a3, a5, b1, d2	<ul style="list-style-type: none"> <li>Pharmacogenomics: definitions (pharmacogenetics, pharmacogenomics)</li> <li>Objective of pharmacogenomics</li> <li>History of pharmacogenomics</li> <li>Genetic elements: Human chromosome (definition, structure, types), DNA(definition, structure, function), genes (definition, structure, functions in production of proteins : steps of production : transcription, translation gene expression )</li> <li>Pharmacological proteins (enzymes, hormones, receptors), transporters with examples of each type and the genes responsible for their production)</li> </ul>	2	4
2	<b>Influence of Genetic variations on drugs pharmacokinetics and pharmacodynamics</b>	a4, a5, b1, b1, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>Phenotype: definition, examples</li> <li>Genotypes : definition, type ( wild-alleles, variant alleles), with examples</li> <li>Influence of genetic variation on drug metabolism ( genetic variation in metabolizing enzymes e.g. CYP) with clinical cases of variations</li> <li>Influence of genetic variation on drug efficacy ( genetic variation in drug receptors and on drug transporters) with clinical cases of variations</li> </ul>	3	6
	<b>Pharmacogenomic studies</b>	a4, a5, b1, b1, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>Phenotyping studies : objectives, procedures, examples</li> <li>Genotyping studies: objectives, procedures, examples</li> <li>Adjustment of doses based on pharmacogenomic studies with examples</li> </ul>	2	4

<ul style="list-style-type: none"> <li>• MID-TERM EXAM</li> <li>• Post-exam disussion</li> </ul>			1	2	
3	<b>Introduction to gene therapy</b>	a2, a4, a5, b1, b3, b4, d2	<ul style="list-style-type: none"> <li>○ Definition and brief history</li> <li>○ Stem cells , somatic cells : differences, examples</li> <li>○ Types of gene therapy: germline gene therapy, somatic gene therapy</li> </ul>	2	4
	<b>Gene delivery systems:</b>	a4, a5, b1, b1, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>○ viral vectors: types and techniques with examples</li> <li>○ non-viral vehicles : types and techniques with examples</li> </ul>	2	4
	<b>Application of gene therapy to treat diseases</b>	a4, a5, b1, b1, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>○ Applications of gene therapy to treat CVS diseases : aims and examples</li> <li>○ Applications of gene therapy to treat Alzheimer : aims and examples</li> <li>○ Applications of gene therapy to treat Diabetes : aims and examples</li> <li>○ Other applications</li> <li>○ Limitation and ethical issues of gene therapy</li> </ul>	2	4
	<b>Course Review</b>	a1, a2, a3, a4, a5, b1, b1, b3, b4, b5 , d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	3 Units

## VI. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VII. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report on one pharmacogenetic study.	a2, d4	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report on one recent advances in gene therapy techniques	a3, d1, d3, d4	14	4

### VIII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, b1, b3, b4, b5
2	Assignments (1 + 2)	4, 14	10	10	b4, c1, c2, d1, d3, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b3, b5
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, , a3, a4, a5, b1, b1, b3, b4, b5, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a2, a6, a3, a4, a5, b1, b2, b1, b4, b1, b3, b7, b8, b9, b9, b4, b5, d2
TOTAL			100	100 %	100

### IX. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Shargel. Biopharmaceutics and pharmacokinetics, 2002, McGraw Hill Inc.
<b>2- Essential References.</b>
1. Anthony Meagre. Gene therapy technologies, applications and regulations, 1999 John Wiley & Sons Ltd
2. Connor. Medical genetics
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

<b>X. Course Policies:</b>	
5.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
6.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
7.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
8.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

Medical sciences college

Department: Pharmacy

Title of the Program: PHARMACY BACHELOR

## Course Specification

### RESEARCH METHODOLOGY & PRESENTATION SKILLS

I. Course Identification and General Information:							
1.	Course Title:	RESEARCH METHODOLOGY & PRESENTATION SKILLS					
2.	Course Code & Number:	MSC 12					
3.	Credit hours:	C.H			TOTAL		
		Theoretical		P.		Tr.	
		L.	Tut.	S.			
		2	-	1	-	-	3
4.	Study level/ semester at which this course is offered:	( Fifth ) Year – ( 1 <sup>ST</sup> ) semester					
5.	Pre –requisite (if any):	-					
6.	Co –requisite (if any):	Biostatistics					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	10/2014					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course is designed to provide the student with knowledge and skills of how to perform researches scientifically and how to write and present their work effectively.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Define research, search, thesis, article, abstract, published paper
2.		a2. Discuss the components of a thesis or a research including introduction, methods, results, discussion, conclusions, recommendations
3.		a3. Identify the procedures and methods of writing a thesis and publishing a research paper.
4.		a4. Determine the types of references and how to write them on a research paper or thesis.
5.	A3	a5. Comprehend his/her role as a pharmacist to implement and obey regulations and acts of medical professions.
6.	B2	b1. Compare between different types of scientific research.
7.	C2	c1. demonstrate skills of presentation of a research.
8.	C3	c2. Search efficiently for information using documented and electronic sources of information.
9.	C4	c3. Present and report his/her work correctly using appropriate writing rules and technologies media.
10.	D1	d1. Share successfully in team-work.
11.	D2	d2. Show respect to life and commit to community and patients serving.
12.	D3	d3. Communicate effectively with his/her colleagues, members of health care team, patients and community
13.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
14.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.



<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
a1, a2, a3, a5	Lecture	Written exam, Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
b1,	Lecture	Written exam, Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1	seminar	seminar assessment
c2, c3	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam, Attendance
d5	Feed-back learning	Assignments

<b>IV. Course Content:</b>					
<b>Order</b>	<b>Units/ Topics List</b>	<b>CILOs</b>	<b>Sub Topics List</b>	<b>No. of Weeks</b>	<b>contact hours</b>
1	<b>Introduction to research methodology</b>	a1, a5, d2	<ul style="list-style-type: none"> <li>• Definition : research, search, thesis, report, abstracts</li> <li>• Types of research and categories of methodologies</li> </ul>	1	3
2	<b>Research Proposal</b>	a3, a5, d2	<ul style="list-style-type: none"> <li>• Definition, objectives</li> <li>• Components of a proposal</li> <li>• Skills of writing a proposal</li> <li>• Examples of proposal templates</li> <li>• Training on writing a proposal</li> </ul>	2	6
3	<b>Components of a research or a thesis</b>	, a5, , d2	<p>Characteristics, academic requirements and details of a thesis/ research project:</p> <ul style="list-style-type: none"> <li>• Titles</li> <li>• Dedication</li> <li>• Acknowledgment</li> <li>• Contents table</li> <li>• Table of Lists of Abbreviations and symbols</li> <li>• Lists of tables and figures</li> <li>• Abstract</li> <li>• Scope of the work and Objectives</li> <li>• Introduction</li> <li>• materials and methods <ul style="list-style-type: none"> <li>○ Materials</li> <li>○ Instrumentations</li> <li>○ Methods</li> <li>○ Experimental studies</li> <li>○ Clinical studies (study Population/sample/Sampling technique, Sample size, Variables definition</li> <li>○ Data analysis</li> </ul> </li> <li>• Results : presentation of tables and figures</li> <li>• Discussion</li> <li>• Conclusions</li> <li>• Recommendations</li> <li>• References</li> <li>• Appendices</li> <li>• Arabic abstract</li> </ul>	5	15

			<ul style="list-style-type: none"> <li>• MID-TERM EXAM</li> <li>• Post-exam discussion</li> </ul>	1	3
4	<b>Thesis/ research paper for publishing</b>	a2, a5, b1, d2	<ul style="list-style-type: none"> <li>• How to write a thesis <b>paper</b>, title, abstract, experimental, results &amp; discussion, references,</li> <li>• Publishing of articles and preparation of reports</li> </ul>	2	6
5	<b>Preparation and skills of Presentation</b>	a2, a5, , d2	<ul style="list-style-type: none"> <li>• Components of a presentation</li> <li>• Electronic presentation (power point slides )</li> <li>• Characteristics of font, color, background of slides</li> <li>• Presentation skills <ul style="list-style-type: none"> <li>○ Voice intonation</li> <li>○ Standing /sitting presentation</li> <li>○ Commenting on slides contents</li> </ul> </li> </ul>	3	9
<b>Course Review</b>		, a1, a2, a3, a5, b1, , , , d2	Review of the course topics by discussion session.	1	3
FINAL - EXAM				1	3
<b>TOTAL</b>				16	48
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>
<p><b>Seminars</b>: these are mainly used with small groups of students (20-30) students in which they find better chances for discussing and participating in the teaching process.</p>

## VI. Assignments:

No	Assignments	Aligned CIOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to prepare a scientific article on topics selected by the teachers	c2, c3, d5	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a scientific presentation on a topic selected by the teacher.	b1, c2, c3, d1, d3, d5	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	, a1, a2, a3, a5, b1, d2
2	Assignments (1 + 2) including seminar	4, 14	10	10	b1, c2, c3, d1, d4, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b1,
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	, a1, a2, a3, a5, b1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	, a1, a2, a3, a5, b1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

C. R. Kothari. Research methodology

### 2- Essential References.

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of

### RESEARCH METHODOLOGY & PRESENTATION SKILLS

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

III. Course Description:
The course is designed to provide the student with knowledge and skills of how to perform researches scientifically and how to write and present their work effectively.

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A2	a1. Define research, search, thesis, article, abstract, published paper
2.		a2. Discuss the components of a thesis or a research including introduction, methods, results, discussion, conclusions, recommendations

3.		a3. Identify the procedures and methods of writing a thesis and publishing a research paper.
4.		a4. Determine the types of references and how to write them on a research paper or thesis.
5.	A3	a5. Comprehend his/her role as a pharmacist to implement and obey regulations and acts of medical professions.
6.	B2	b1. Compare between different types of scientific research.
7.	C2	c1. demonstrate skills of presentation of a research.
8.	C3	c2 .Search efficiently for information using documented and electronic sources of information.
9.	C4	c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
10.	D1	d1. Share successfully in team-work.
11.	D2	d2. Show respect to life and commit to community and patients serving.
12.	D3	d3. Communicate effectively with his/her colleagues, members of health care team, patients and community
13.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
14.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

2. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2 , a3, a5	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning	Teaching strategies	Assessment Strategies



<b>Outcomes</b>		
<b>b1,</b>	Lecture	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
<b>c1</b>	seminar	seminar assessment
<b>c2, c3</b>	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
<b>d1, d3, d4</b>	Feed-back learning	Assignments
<b>d2</b>	Lecture	Written exam , Attendance
<b>d5</b>	Feed-back learning	Assignments

<b>IV. Course Content:</b>					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to research methodology</b>	a1, a5, d2	<ul style="list-style-type: none"> <li>• Definition : research, search, thesis, report, abstracts</li> <li>• Types of research and categories of methodologies</li> </ul>	1	3
2	<b>Research Proposal</b>	a3, a5, d2	<ul style="list-style-type: none"> <li>• Definition, objectives</li> <li>• Components of a proposal</li> <li>• Skills of writing a proposal</li> </ul>	2	6

			<ul style="list-style-type: none"> <li>• Examples of proposal templates</li> <li>• Training on writing a proposal</li> </ul>		
3	<b>Components of a research or a thesis</b>	, a5, , d2	<p>Characteristics, academic requirements and details of a thesis/ research project:</p> <ul style="list-style-type: none"> <li>• Titles</li> <li>• Dedication</li> <li>• Acknowledgment</li> <li>• Contents table</li> <li>• Table of Lists of Abbreviations and symbols</li> <li>• Lists of tables and figures</li> <li>• Abstract</li> <li>• Scope of the work and Objectives</li> <li>• Introduction</li> <li>• materials and methods <ul style="list-style-type: none"> <li>○ Materials</li> <li>○ Instrumentations</li> <li>○ Methods</li> <li>○ Experimental studies</li> <li>○ Clinical studies (study Population/sample/Sampling technique, Sample size, Variables definition</li> <li>○ Data analysis</li> </ul> </li> <li>• Results : presentation of tables and figures</li> <li>• Discussion</li> <li>• Conclusions</li> <li>• Recommendations</li> <li>• References</li> <li>• Appendices</li> <li>• Arabic abstract</li> </ul>	5	15
			<ul style="list-style-type: none"> <li>• MID-TERM EXAM</li> <li>• Post-exam discussion</li> </ul>	1	3
4	<b>Thesis/ research paper for publishing</b>	a2, a5, b1, d2	<ul style="list-style-type: none"> <li>• How to write a thesis <b>paper</b>, title, abstract, experimental, results &amp; discussion, references,</li> <li>• Publishing of articles and preparation of reports</li> </ul>	2	6
5	<b>Preparation and skills of Presentation</b>	a2, a5, , d2	<ul style="list-style-type: none"> <li>• Components of a presentation</li> <li>• Electronic presentation (power point slides )</li> </ul>	3	

			<ul style="list-style-type: none"> <li>• Characteristics of font, color, background of slides</li> <li>• Presentation skills <ul style="list-style-type: none"> <li>○ Voice intonation</li> <li>○ Standing /sitting presentation</li> <li>○ Commenting on slides contents</li> </ul> </li> </ul>		9
<b>Course Review</b>	, a1, a2, a3, a5, b1, , , , d2	Review of the course topics by discussion session.		1	3
FINAL - EXAM				1	3
<b>TOTAL</b>				16	48
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

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No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to prepare a scientific article on topics selected by the teachers	c2, c3, d5	4-13	6
2	<b>Group :</b> each group of students will be assigned to provide a scientific presentation on a topic selected by the teacher.	b1, c2, c3, d1, d3, d5	14	4

VII. Schedule of Assessment Tasks for Students During the Semester					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	, a1, a2, a3, a5, b1, d2
2	Assignments (1 + 2) including seminar	4, 14	10	10	b1, c2, c3, d1, d4, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b1,
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	, a1, a2, a3, a5, b1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	, a1, a2, a3, a5, b1, d2
TOTAL			100	100 %	100

<b>IX. Learning Resources:</b>	
<b>1- Required Textbook(s) ( maximum two ).</b>	
C. R. Kothari. Research methodology	
<b>2- Essential References.</b>	
<b>3- Electronic Materials and Web Sites etc.</b>	
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>	

<b>IX.Course Policies:</b>	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b>

	Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.
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## Course Specification

### PHARMACY PRACTICE SKILLS

<b>I. Course Identification and General Information:</b>						
1.	Course Title:	PHARMACY PRACTICE SKILLS				
2.	Course Code & Number:	PHRT 20				
3.	Credit hours:	C.H			TOTAL	
		Theoretical		P.		Tr.
		L.	Tut.			
		2	-	-		1
4.	Study level/ semester at which this course is offered:	( <i>FOURTH</i> ) Year – ( <i>2<sup>ND</sup></i> ) semester				
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>Introduction to pharmacy profession</li> <li>Pharmaceutical calculations</li> <li>Pharmaceutics I, II &amp; III</li> <li>Cosmetic preparations</li> </ul>				
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>Pharmacy training II</li> </ul>				
7.	Program (s) in which the course is offered:	All BC programs offered by the university				
8.	Language of teaching the course:	ENGLISH				
9.	Location of teaching the course:	IN THE UNIVERSITY				
10	Prepared By:					
11	Date of Approval	<b>10/2014</b>				

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course is designed to provide the students the necessary knowledge and skills for as professional practicing of pharmacy especially in community pharmacies. This course is alongside with the " Pharmacy training I" course .

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A2	a1. Determine the essential drug product specifications: employed in community pharmacies such as trade names, dosage forms available, strength, pharmaceutical companies.
2.		a2. Determine types of medications dispensed without the need of medical prescriptions (OTC medications) and the types of extemporaneous preparations prepared by the pharmacist in pharmacy Lab.
3.	A3	a3. Grasp the regulations of dispensing of medications.
4.	A4	a4. Comprehend his/her role as a pharmacist in community pharmacists in serving patients and management of pharmacy.
5.	B1	b1. Differentiate between OTC medications and other medications.
6.		b2. Compare between medications therapeutically, pharmaceutically and commercially.
7.	B4	b3 . Assess the patient case and the requirement to physician referral or not.
8.		b4. Select the most appropriate OTC medications for minor patient cases.
9.	C2	c1. Recommend patients to use appropriate OTC medications and to correctly administer their medications
10.		c2. Dispense medications correctly and efficiently using standard procedures/
11.		c3. Administer pharmacy effectively and arrange medications in the pharmacy efficiently.
12.	C4	c4 .Search efficiently for information using documented and electronic sources of information.
13.		c5. Present and report his/her works correctly using appropriate writing rules and technologies media.
14.	D1	d1. Share successfully in team-work.
15.	D2	d2. Show respect to life and commit to community and patients serving.
16.	D3	d3. Communicate effectively with his/her colleagues and patients.
17.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during



		practicing practical and professional works and assignments.
18.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

2. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
a3, a4	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3, b4	Lecture , laboratory practice, feed-back learning	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), quizzes
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 , c2, c3,	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), assignments
c4	feed-back learning, Group-project	Assignments
c5	laboratory practice, feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam), assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching</b>		

<b>Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1, d3, d4</b>	laboratory practice , feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam), assignments
<b>d2</b>	Lecture	Written exam , Attendance
<b>d5 d5</b>	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a4, b2, d2	<ul style="list-style-type: none"> <li><input type="checkbox"/> Filed of pharmacy practices, community pharmacy practice: objectives, requirements (pharmacist skills, knowledge, source of information: medical indexes "BNF", personal elegance ).</li> <li><input type="checkbox"/> drug product specifications: generic name, strength, trade name, manufacturer, country, leaflet components, Services offered to patients in community pharmacies (in brief)</li> </ul>	1	2
2	<b>Skills and knowledge of Dispensing medication</b>	a2, a4, c2, d2	<ul style="list-style-type: none"> <li><input type="checkbox"/> Items (details) of medical prescription</li> <li><input type="checkbox"/> Skills of dispensing : Standard Operating procedures (SOPs) of preparing a prescription: : careful reading, identifying the items of the prescription, checking of legality, making necessary calculation, checking, bringing medication, second checking, packaging, giving necessary instructions, answering patient`s questions</li> <li><input type="checkbox"/> Case studies and training on the SOPs of dispensing: examples of written prescriptions</li> </ul>	1	2
3	<b>Specific requirements for dispensing of controlled medications</b>	a2, a4, c2, d2	<ul style="list-style-type: none"> <li><input type="checkbox"/> Types of medications : Prescription Only medications (POMs) risks and need of awareness !</li> <li><input type="checkbox"/> Types of controlled drugs</li> <li><input type="checkbox"/> Regulations for prescription: legal prescribers, legally signed</li> <li><input type="checkbox"/> Prescription forms</li> <li><input type="checkbox"/> Addict (installment) prescriptions for controlled drugs</li> <li><input type="checkbox"/> Requisitions forms</li> <li><input type="checkbox"/> Record-keeping on a register ( example of a register form)</li> </ul>	1	2

			<input type="checkbox"/> Case study: training on controlled drug prescriptions		
4	<b>Recommending of OTC medications in response to symptoms</b>	a2, , b1, a4, b2, b3, b4, c1, d2	<input type="checkbox"/> Types of medications (OTC) dispensed without a prescription. <input type="checkbox"/> Factors to be considered when responding to symptoms in the pharmacy. <input type="checkbox"/> Observation of patient`s symptoms <input type="checkbox"/> Making a differential diagnosis <input type="checkbox"/> acronyms (SIT, ASMETHOD, ENCORE )used when responding to symptoms in a pharmacy <input type="checkbox"/> Taking a case history <input type="checkbox"/> Case study examples	4	8
MID-TERM EXAM				1	2
5	<b>Preparation and dispensing of extemporaneous products</b>	a2, a4, d2	<input type="checkbox"/> Types of extemporaneous preparations: from raw materials, from dosage forms (e.g. preparations of oral liquids from capsules, tablets and injectons) <input type="checkbox"/> Requirements of pharmaceutical lab. In the pharmacy <input type="checkbox"/> Information references e.g. British pharmacopeia <input type="checkbox"/> Challenge and troubles: Ingredients quality, stability, quality control testing <input type="checkbox"/> Packaging of extemporaneous preparations	2	4
6	<b>Patient`s counseling</b>	a4, b3, b4, c1, d2, d3, d2	<input type="checkbox"/> Skills for patients counseling: communication with the patient <input type="checkbox"/> Products-specific counseling points: explaining to the patient how to use (apply and take dose) of the following products correctly and what precautions should he/she avoid <input type="checkbox"/> Ophthalmic preparations: eye drops and ointments. <input type="checkbox"/> Nasal drops and sprays <input type="checkbox"/> Inhalers <input type="checkbox"/> Oral products: tablets, capsules, liquids, powders/granules <input type="checkbox"/> Suppositories, pessaries an vaginal	2	4

			creams <input type="checkbox"/> Topical dermatological preparations		
7	<b>Pharmacy administration</b>	a4, d2	<input type="checkbox"/> Documentation, indexing <input type="checkbox"/> Pricing, procurement, selling <input type="checkbox"/> Stock control <input type="checkbox"/> Storage areas I community pharmacy	2	4
	<b>Course Review</b>	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2, c3, d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units

<b>B - Practical Aspect: The practical sections are carried out in the " Virtual pharmacy Lab"</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs
1.	Drug product specification	2	4	a1, a4, b2, c5, d1, d2, d3, , d4, d5
2.	Arrangement of medication in community pharmacy	2	4	a4, c3, c5, d1, d2, d3, , d4, d5
3.	OTC medications	2	4	a2, a4, b1, b2, d1, d2, d3, , d4, d5
4.	Prescription only medications and controlled drugs.	1	2	a4, b2, c5, d1, d2, d3, , d4, d5
5.	Skills of dispensing	1	2	a3, a4, c2, c5, d1, d2, d3, , d4, d5
6.	Patient`s counseling	2	4	a4, b3, b4, c1, d1, d2, d3, , d4, d5
7.	Pharmacy administration skills	1	2	c3, c5, d1, d2, d3, , d4, d5
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Laboratory practice**: students doing experiments in labs individually or in small groups
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

VI. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to provide a search-based report on a type of OTC medications	c4, c5, d5	4-13	3
2	<b>Group :</b> each group of students will be assigned to provide a booklet of drug index of the a commercial drug products s of 1-2 drug categories.	c4, c5, d1, d3, d5	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2, c3, d2
2	Assignments (1 + 2)	4, 14	5	5	c4, c5, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b2, b4
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a4, b1, b2, b3, b4, c1, c2, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2, c3, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, a4, b1, b2,b3, c1, c2, c3, c5, d1, d2, d3, , d4, d5
2	Lab. Attitude	weekly	2.5	2.5	c6, d1, d3, d4
3	Lab. Accomplishments	weekly	2.5	2.5	a1, a2, a4, b1, b2,b3, c1, c2, c3, c5
4	Lab. Reporting	weekly	5	5	c5
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, a4, b1, b2,b3, c1, c2, c3, c5
6	Practical exam (practical)	14	20	20	a1, a2, a4, b1, b2,b3, c1, c2, c3, c5
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Lillian M Azzopardi. Lecture notes on pharmacy practice, 2010, Pharmaceutical press.Christopher
2. A Langley, Dawn Belcher. Applied pharmaceutical skills, 2009, Pharmaceutical press.

### 2- Essential References.

1. Agarwal. Dispensing and community pharmacy
2. Jain. A text book of professional pharmacy

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



### IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of PHARMACY PRACTICE SKILLS

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

### II. Course Description:

The course is designed to provide the students the necessary knowledge and skills for as professional practicing of pharmacy especially in community pharmacies. This course is alongside with the " Pharmacy training I" course .

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A2	a1. Determine the essential drug product specifications: employed in community pharmacies such as trade names, dosage forms available, strength, pharmaceutical companies.
2.		a2. Determine types of medications dispensed without the need of medical prescriptions (OTC medications) and the types of extemporaneous preparations prepared by the pharmacist in pharmacy Lab.
3.	A3	a3. Grasp the regulations of dispensing of medications.
4.	A4	a4. Comprehend his/her role as a pharmacist in community pharmacists in serving patients and management of pharmacy.
5.	B1	b1. Differentiate between OTC medications and other medications.
6.		b2. Compare between medications therapeutically, pharmaceutically and commercially.
7.	B4	b3 . Assess the patient case and the requirement to physician referral or not.
8.		b4. Select the most appropriate OTC medications for minor patient cases.
9.	C2	c1. Recommend patients to use appropriate OTC medications and to correctly administer their medications
10.		c2. Dispense medications correctly and efficiently using standard procedures/
11.		c3. Administer pharmacy effectively and arrange medications in the pharmacy efficiently.
12.	C4	c4 .Search efficiently for information using documented and electronic sources of information.
13.		c5. Present and report his/her works correctly using appropriate writing rules and technologies media.
14.	D1	d1. Share successfully in team-work.
15.	D2	d2. Show respect to life and commit to community and patients serving.
16.	D3	d3. Communicate effectively with his/her colleagues and patients.
17.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during

		practicing practical and professional works and assignments.
18.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

2. Alignment CILOs to teaching strategies and assessment strategies		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
a3, a4	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3, b4	Lecture , laboratory practice, feed-back learning	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), quizzes
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 , c2, c3,	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), assignments
c4	feed-back learning, Group-project	Assignments
c5	laboratory practice, feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam), assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching</b>		

<b>Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1, d3, d4</b>	laboratory practice , feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam), assignments
<b>d2</b>	Lecture	Written exam , Attendance
<b>d5 d5</b>	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a4, b2, d2	<ul style="list-style-type: none"> <li><input type="checkbox"/> Filed of pharmacy practices, community pharmacy practice: objectives, requirements (pharmacist skills, knowledge, source of information: medical indexes "BNF", personal elegance ).</li> <li><input type="checkbox"/> drug product specifications: generic name, strength, trade name, manufacturer, country, leaflet components, Services offered to patients in community pharmacies (in brief)</li> </ul>	1	2
2	<b>Skills and knowledge of Dispensing medication</b>	a2, a4, c2, d2	<ul style="list-style-type: none"> <li><input type="checkbox"/> Items (details) of medical prescription</li> <li><input type="checkbox"/> Skills of dispensing : Standard Operating procedures (SOPs) of preparing a prescription: : careful reading, identifying the items of the prescription, checking of legality, making necessary calculation, checking, bringing medication, second checking, packaging, giving necessary instructions, answering patient`s questions</li> <li><input type="checkbox"/> Case studies and training on the SOPs of dispensing: examples of written prescriptions</li> </ul>	1	2
3	<b>Specific requirements for dispensing of controlled medications</b>	a2, a4, c2, d2	<ul style="list-style-type: none"> <li><input type="checkbox"/> Types of medications : Prescription Only medications (POMs) risks and need of awareness !</li> <li><input type="checkbox"/> Types of controlled drugs</li> <li><input type="checkbox"/> Regulations for prescription: legal prescribers, legally signed</li> <li><input type="checkbox"/> Prescription forms</li> <li><input type="checkbox"/> Addict (installment) prescriptions for controlled drugs</li> <li><input type="checkbox"/> Requisitions forms</li> <li><input type="checkbox"/> Record-keeping on a register ( example of a register form)</li> </ul>	1	2

			<input type="checkbox"/> Case study: training on controlled drug prescriptions		
4	<b>Recommending of OTC medications in response to symptoms</b>	a2, , b1, a4, b2, b3, b4, c1, d2	<input type="checkbox"/> Types of medications (OTC) dispensed without a prescription. <input type="checkbox"/> Factors to be considered when responding to symptoms in the pharmacy. <input type="checkbox"/> Observation of patient`s symptoms <input type="checkbox"/> Making a differential diagnosis <input type="checkbox"/> acronyms (SIT, ASMETHOD, ENCORE )used when responding to symptoms in a pharmacy <input type="checkbox"/> Taking a case history <input type="checkbox"/> Case study examples	4	8
MID-TERM EXAM				1	2
5	<b>Preparation and dispensing of extemporaneous products</b>	a2, a4, d2	<input type="checkbox"/> Types of extemporaneous preparations: from raw materials, from dosage forms (e.g. preparations of oral liquids from capsules, tablets and injectons) <input type="checkbox"/> Requirements of pharmaceutical lab. In the pharmacy <input type="checkbox"/> Information references e.g. British pharmacopeia <input type="checkbox"/> Challenge and troubles: Ingredients quality, stability, quality control testing <input type="checkbox"/> Packaging of extemporaneous preparations	2	4
6	<b>Patient`s counseling</b>	a4, b3, b4, c1, d2, d3, d2	<input type="checkbox"/> Skills for patients counseling: communication with the patient <input type="checkbox"/> Products-specific counseling points: explaining to the patient how to use (apply and take dose) of the following products correctly and what precautions should he/she avoid <input type="checkbox"/> Ophthalmic preparations: eye drops and ointments. <input type="checkbox"/> Nasal drops and sprays <input type="checkbox"/> Inhalers <input type="checkbox"/> Oral products: tablets, capsules, liquids, powders/granules <input type="checkbox"/> Suppositories, pessaries an vaginal	2	4

			creams <input type="checkbox"/> Topical dermatological preparations		
7	<b>Pharmacy administration</b>	a4, d2	<input type="checkbox"/> Documentation, indexing <input type="checkbox"/> Pricing, procurement, selling <input type="checkbox"/> Stock control <input type="checkbox"/> Storage areas I community pharmacy	2	4
	<b>Course Review</b>	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2, c3, d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units

**B - Practical Aspect:** The practical sections are carried out in the " Virtual pharmacy Lab"

Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs
1.	Drug product specification	2	4	a1, a4, b2, c5, d1, d2, d3, , d4, d5
2.	Arrangement of medication in community pharmacy	2	4	a4, c3, c5, d1, d2, d3, , d4, d5
3.	OTC medications	2	4	a2, a4, b1, b2, d1, d2, d3, , d4, d5
4.	Prescription only medications and controlled drugs.	1	2	a4, b2, c5, d1, d2, d3, , d4, d5
5.	Skills of dispensing	1	2	a3, a4, c2, c5, d1, d2, d3, , d4, d5
6.	Patient`s counseling	2	4	a4, b3, b4, c1, d1, d2, d3, , d4, d5
7.	Pharmacy administration skills	1	2	c3, c5, d1, d2, d3, , d4, d5



PRACTICAL EXAM	1	2	
<b>Total</b>	12	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>		<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report on a type of OTC medications	c4, c5, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to provide a booklet of drug index of the a commercial drug products sof 1-2 drug categories.	c4, c5, d1, d3, d5	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2, c3, d2
2	Assignments (1 + 2)	4, 14	5	5	c4, c5, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b2, b4
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a1, a2, a4, b1, b2, b3, b4, c1, c2, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2, c3, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, a4, b1, b2,b3, c1, c2, c3, c5, d1, d2, d3, , d4, d5
2	Lab. Attitude	weekly	2.5	2.5	c6, d1, d3, d4
3	Lab. Accomplishments	weekly	2.5	2.5	a1, a2, a4, b1, b2,b3, c1, c2, c3, c5
4	Lab. Reporting	weekly	5	5	c5
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, a4, b1, b2,b3, c1, c2, c3, c5
6	Practical exam (practical)	14	20	20	a1, a2, a4, b1, b2,b3, c1, c2, c3, c5
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Lillian M Azzopardi. Lecture notes on pharmacy practice, 2010, Pharmaceutical press.Christopher
2. A Langley, Dawn Belcher. Applied pharmaceutical skills, 2009, Pharmaceutical press.

### 2- Essential References.

1. Agarwal. Dispensing and community pharmacy
2. Jain. A text book of professional pharmacy

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PHARMACOKINETICS

<b>I. Course Identification and General Information:</b>					
1.	Course Title:	PHARMACOKINETICS			
2.	Course Code & Number:	PHRT 22			
3.	Credit hours:	C.H			TOTAL
		Theoretical			
		L.	Tut.	S.	
		2	1	-	
		P.	Tr.		
		-	-		
4.	Study level/ semester at which this course is offered:	( FIFTH ) Year – ( 1 <sup>ST</sup> ) semester			
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>Mathematics</li> <li>Pharmaceutics I , II &amp; III</li> <li>Blopharmaceutics</li> </ul>			
6.	Co –requisite (if any):	NONE			
7.	Program (s) in which the course is offered:	All BC programs offered by the university			
8.	Language of teaching the course:	ENGLISH			
9.	Location of teaching the course:	IN THE UNIVERSITY			
10	Prepared By:				
11	Date of Approval	<b>10/2014</b>			

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

<b>I. Course Description:</b>
<p>The course deals with the study of substantial mathematical kinetics of absorption, distribution, metabolism and excretion (ADME) of drugs..</p>

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A3	a1. Discuss the basic mathematical principles of calculations of pharmacokinetic processes.
2.		a2. Identify the types of order of drug amount change in the body and the models of pharmacokinetic distribution
3.		a3. Recognize the step-wise procedures and techniques employed during pharmacokinetic studies and data analysis obtained after analysis of blood, urine or other samples.
4.	A4	a4. Comprehend his/her role as a pharmacist to calculate pharmacokinetic parameters of intravenous and extra vascular, administration of drugs, correctly and efficiently.
5.	B1	b1. Interpret the graphical parameters of drug concentration in the body versus time.
6.	B2	b2. Solve graphically & mathematical pharmacokinetics problems.
7.		b3. Determine the model at which drug distribute in the body and the orders at which the drug concentration in the body changes.
8.		b4. Calculate the drug concentration in the body at any given time.
9.		b5. Calculate the drug bioavailability mathematically.
10.		b6. calculate the dose required to attain a therapeutic concentration in the body.
11.		b7. Compare between pharmacokinetic parameter of absorption, distribution, excretion or metabolism of different drugs or formulations
12.	B4	b8. Assess the bioavailability of different drugs/ formulations in comparison to other drugs/ formulations..
13.	C1	c1. Operate and use scientific calculator correctly such as logarithm, natural logarithm, natural bases to determine pharmacokinetic parameters
14.	C2	c2. Apply equations and rules to solve of pharmacokinetics to obtain definite data of drug kinetics in the body.
15.	C4	c3. Present and report his work effectively and correctly.
16.	D1	d1. Share successfully in team-work.
17.	D5	d2. Demonstrate time management during solving mathematical problems

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1 , a2, a3, a4	lecture-discussion , feed-back learning	Written exam , Attendance assignments
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3, b4, b5, b6, b7, b8	lecture-discussion , feed-back learning	Written exam , Attendance assignments , quizzes
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	lecture-discussion , feed-back learning	Written exam , Attendance assignments
c3	feed-back learning	assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Feed-back learning	Assignments
d5	Feed-back learning	Assignments

#### IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a4, b1, b2, c1	<ul style="list-style-type: none"> <li>definition and significance of pharmacokinetics , abbreviations and brief definitions of pharmacokinetic data . Definitions , significance, related equations of substantial pharmacokinetic data : half-life (<math>t_{1/2}</math>), clearance (Cl), volume of distribution, (Vd), Area under the curve (<math>AUC_{\infty}</math>)</li> <li>□ Mathematical fundamentals of pharmacokinetics: Common logarithm (log) , natural logarithm (ln), base exponent (<math>e^{-x}</math>), Demonstrating of X Y data : tabular form, graphical form (semilog paper, rectangular coordinate paper), Straight line : general equation, determination of slope and rate constant graphically on, semilog paper, rectangular coordinate paper <i>with Solved and homework problems.</i></li> </ul>	2	6
2	<b>Pharmacokinetic study</b>	a1, a2, a3, c1	<ul style="list-style-type: none"> <li>Dosing : drug administration. Sampling: blood, urine , others (advantages, disadvantage), interval of sampling, considerations of sampling. Analyzing of sample. Data from urine samples analysis : curves of cumulative amount of drug excreted (<math>\Sigma Du</math>) versus time, excretion rate (<math>\Sigma Du/dt</math>) versus time, amount of drug remaining to be excreted (<math>ARE = Du_{\infty} - \Sigma Du</math>) versus time. Data from blood samples analysis : drug concentration in plasma (Cp) versus time curve after</li> </ul>	1	3

			intravenous and extravascular administration		
3	<b>Analysis of data</b>	a1, a2, a3, b2, c1, c2, d5	<ul style="list-style-type: none"> <li>(i) Determination Area under the curve (<math>AUC_{\infty}</math>) mathematically by trapezoidal method with <i>Solved and homework exercises</i></li> <li>(ii) <b>Pharmacokinetic models of distribution:</b> definition, significance, types (one-compartment, two compartments, three compartment) and principle of each model, graphical figures illustrating each model after intravenous and extravascular administration, determination of pharmacokinetic model mathematically and graphically with <i>Solved and homework problems</i></li> <li>(iii) <b>The order of kinetic rate :</b> definition, significance and types (first order, zero order), Determination of the order of elimination rate from the last points : mathematically, graphically (semilog paper, rectangular paper) <i>with Solved and homework problems.</i> Determination of the distribution rate in two compartment model, from the points after the maximum <math>C_p</math> , graphically (semilog paper, rectangular paper) by extrapolation residual line method <i>with Solved and homework problems</i></li> </ul>	2	6
4 (I)	<b>Pharmacokinetics of drugs given by intravenous administration</b>	a1, b1, b2, b3, b4, b6, c1, c2, d5	<ul style="list-style-type: none"> <li>(graphical and tabular representation, general equations of drug concentration</li> </ul>	2	6



			<p>in plasma at a given time, determination of rates constant, volume of distribution, half-life, clearance and other pharmacokinetic data) <b>with Solved and homework problems</b> for</p> <p><b>1- I.V. single bolus</b></p> <ul style="list-style-type: none"> <li>• <b>Blood data</b></li> <li><input type="checkbox"/> One-compartment : first-order elimination, zero order elimination</li> <li><input type="checkbox"/> Two compartment: first-order elimination, zero order elimination</li> </ul> <p><b>Urine data</b></p> <li><input type="checkbox"/> One-compartment : first-order elimination, zero order elimination, excretion rate versus time, ARE versus time</li>		
MID-TERM EXAM				1	3
4 (II)	<b>Pharmacokinetics of drugs given by intravenous administration</b>		<p><b>2. I.V. multiple dosing :</b> One-compartment assuming first order elimination , specific data (Cmax, Cmin, Cmax<math>\infty</math>, Cmin<math>\infty</math>, CP<math>\infty</math>, CSS,</p> <ul style="list-style-type: none"> <li>• <b>3. I.V. infusion: one-compartment model:</b> specific data (rate of infusion(R), steady state concentration C<sub>ss</sub>, maintenance dose D<sub>m</sub>, loading dose DL) . General equations and how to determine specific data and substantial data (half-life (t 1/2), clearance (Cl), volume of distribution, (Vd))</li> </ul> <p>When the rate of infusion is constant , the rate of infusion changes, when I.V. bolus</p>	2	6
5	<b>Pharmacokinetics of drugs given by extravascular administration (oral,</b>	a1, b1, b2, b3, b4, b6c1, c2, d5	<ul style="list-style-type: none"> <li>• graphical and tabular representation of pharmacokinetic data</li> <li>• (graphical and tabular</li> </ul>	2	

	intramuscular, sublingual, buccal, rectal, etc)		<p>representation, general equations of drug concentration in plasma at a given time, determination of rates constant, volume of distribution, half-life, clearance and other pharmacokinetic data)</p> <p><b>with Solved and homework problems</b> for</p> <p><b>1. extravascular Single dosing</b></p> <ul style="list-style-type: none"> <li>• (A) Blood data</li> <li>• Definitions of Specific data of absorption phase: <math>K_a</math>, <math>F</math>, <math>C_{max}</math>, <math>T_{max}</math>, <math>D_{ab}</math>, <math>D_{ab\infty}</math>, <math>f_{ab}</math> (fraction absorbed), <math>f_{ua}</math> (fraction unabsorbed),</li> <li>• o Determination of elimination rate constant and half-life from the last points of elimination phase</li> <li>• o determination of <math>K_a</math> by residual method from</li> <li>• <math>C_p</math> versus time curve.</li> <li>• o determination of <math>C_{max}</math>, <math>T_{max}</math>, mathematically</li> <li>• o determination of <math>D_{ab}</math>, <math>D_{ab\infty}</math>, <math>f_{ab}</math>, <math>f_{ua}</math></li> <li>• o determination of <math>K_a</math> by Wagner – Nelson method from</li> <li>• <math>f_{ua}</math> versus time curve</li> </ul> <p><b>(B) Urine data</b></p> <ul style="list-style-type: none"> <li>• <input type="checkbox"/> One-compartment : first-order elimination, zero order elimination, ARE versus time</li> </ul> <p><b>2. extravascular multiple dosing :</b>        One-compartment assuming first order elimination: One-compartment assuming first order elimination , specific data (<math>C_{max}</math>, <math>C_{min}</math>, <math>C_{max\infty}</math>, <math>C_{min\infty}</math>, <math>CP_{\infty}</math>, <math>CSS</math>, )</p>		6
6	<b>Clinical Pharmacokinetics</b>	a1, b1, b2, b3, b4, b5, b6, b7,	<ul style="list-style-type: none"> <li>• (i) Loading and maintenance doses</li> <li>• (ii) Doses and dosage interval at change from I.V. infusion</li> </ul>	2	

		b8, c1, c2, d5	to oral administration. <ul style="list-style-type: none"> <li>(iii) Changes in plasma concentration with change in route of administration. Dose based on creatinine clearance</li> <li>(iv) Dose in the elderly</li> <li>(v) <b>Determination of absolute ad relative bioavailability</b> from blood and urine data</li> </ul>		6
<b>Course Review</b>		a1, a2, a3, a4, b1, b2, b3, b4, c1, c2	Review of the course topics by discussion session.	1	3
<b>FINAL - EXAM</b>				1	3
<b>TOTAL</b>				16	48
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units

## V. Teaching strategies of the course:

**lecture - Discussion:** a short lecture/ address followed by discussion

**Feed-back learning:** students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve mathematical problems during Tutorial at the class .	b2, b3, b4, b5, b6, b7, d5	4-13	6
2	<b>Group :</b> each group of students will be assigned to solve mathematical problems as homework.	b2, b3, b4, b5, b6, b7, d1	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2
2	Assignments (1 + 2)	4-13, 14	10	10	a1, b2, b4, c1, d1, d2
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b3, b4, b5, b6, b7, d5
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, b1, b2, b3, b4, b6, , c1, c2, d5
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2
TOTAL			100	100 %	

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
<ol style="list-style-type: none"> <li>1. Shargel. Biopharmaceutics and pharmacokinetics, 2002, McGraw Hill Inc</li> <li>2. Malcolm Rowland. Clinical pharmacokinetics: concepts an applications, 1996, Lippincott's Williams &amp; Wilkins</li> </ol>
<b>2- Essential References.</b>
<ol style="list-style-type: none"> <li>1. Wagner. Pharmacokinetics for the pharmaceutical scientist</li> <li>2. Venkaeswarlu. Biopharmaceutics and pharmacokinetics</li> </ol>
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of PHARMACOKINETICS

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

### II. Course Description:

The course deals with the study of substantial mathematical kinetics of absorption, distribution, metabolism and excretion (ADME) of drugs..

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
1. Alignment CILOs to PILOs		
No.	PILOs	CILOs
1.	A3	a1. Discuss the basic mathematical principles of calculations of pharmacokinetic processes.
2.		a2. Identify the types of order of drug amount change in the body and the models of pharmacokinetic distribution
3.		a3. Recognize the step-wise procedures and techniques employed during pharmacokinetic studies and data analysis obtained after analysis of blood, urine or other samples.
4.	A4	a4. Comprehend his/her role as a pharmacist to calculate pharmacokinetic parameters of intravenous and extra vascular, administration of drugs, correctly and efficiently.
5.	B1	b1. Interpret the graphical parameters of drug concentration in the body versus time.
6.	B2	b2. Solve graphically & mathematical pharmacokinetics problems.
7.		b3. Determine the model at which drug distribute in the body and the orders at which the drug concentration in the body changes.
8.		b4. Calculate the drug concentration in the body at any given time.
9.		b5. Calculate the drug bioavailability mathematically.
10.		b6. calculate the dose required to attain a therapeutic concentration in the body.
11.		b7. Compare between pharmacokinetic parameter of absorption, distribution, excretion or metabolism of different drugs or formulations
12.	B4	b8. Assess the bioavailability of different drugs/ formulations in comparison to other drugs/ formulations..
13.	C1	c1. Operate and use scientific calculator correctly such as logarithm, natural logarithm, natural bases to determine pharmacokinetic parameters
14.	C2	c2. Apply equations and rules to solve of pharmacokinetics to obtain definite data of drug kinetics in the body.
15.	C4	c3. Present and report his work effectively and correctly.
16.	D1	d1. Share successfully in team-work.
17.	D5	d2. Demonstrate time management during solving mathematical problems

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1 , a2, a3, a4	lecture-discussion , feed-back learning	Written exam , Attendance assignments
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3, b4, b5, b6, b7, b8	lecture-discussion , feed-back learning	Written exam , Attendance assignments , quizzes
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	lecture-discussion , feed-back learning	Written exam , Attendance assignments
c3	feed-back learning	assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Feed-back learning	Assignments
d5	Feed-back learning	Assignments



#### IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a4, b1, b2, c1	<ul style="list-style-type: none"> <li>definition and significance of pharmacokinetics , abbreviations and brief definitions of pharmacokinetic data . Definitions , significance, related equations of substantial pharmacokinetic data : half-life (<math>t_{1/2}</math>), clearance (Cl), volume of distribution, (Vd), Area under the curve (<math>AUC_{\infty}</math>)</li> <li>□ Mathematical fundamentals of pharmacokinetics: Common logarithm (log) , natural logarithm (ln), base exponent (<math>e^{-x}</math>), Demonstrating of X Y data : tabular form, graphical form (semilog paper, rectangular coordinate paper), Straight line : general equation, determination of slope and rate constant graphically on, semilog paper, rectangular coordinate paper <i>with Solved and homework problems.</i></li> </ul>	2	6
2	<b>Pharmacokinetic study</b>	a1, a2, a3, c1	<ul style="list-style-type: none"> <li>Dosing : drug administration. Sampling: blood, urine , others (advantages, disadvantage), interval of sampling, considerations of sampling. Analyzing of sample. Data from urine samples analysis : curves of cumulative amount of drug excreted (<math>\Sigma Du</math>) versus time, excretion rate (<math>\Sigma Du/dt</math>) versus time, amount of drug remaining to be excreted (<math>ARE = Du_{\infty} - \Sigma Du</math>) versus time. Data from blood samples analysis : drug concentration in plasma (Cp) versus time curve after</li> </ul>	1	3

			intravenous and extravascular administration		
3	<b>Analysis of data</b>	a1, a2, a3, b2, c1, c2, d5	<ul style="list-style-type: none"> <li>(i) Determination Area under the curve (<math>AUC_{\infty}</math>) mathematically by trapezoidal method with <i>Solved and homework exercises</i></li> <li>(ii) <b>Pharmacokinetic models of distribution:</b> definition, significance, types (one-compartment, two compartments, three compartment) and principle of each model, graphical figures illustrating each model after intravenous and extravascular administration, determination of pharmacokinetic model mathematically and graphically with <i>Solved and homework problems</i></li> <li>(iii) <b>The order of kinetic rate :</b> definition, significance and types (first order, zero order), Determination of the order of elimination rate from the last points : mathematically, graphically (semilog paper, rectangular paper) <i>with Solved and homework problems.</i> Determination of the distribution rate in two compartment model, from the points after the maximum <math>C_p</math> , graphically (semilog paper, rectangular paper) by extrapolation residual line method <i>with Solved and homework problems</i></li> </ul>	2	6
4 (I)	<b>Pharmacokinetics of drugs given by intravenous administration</b>	a1, b1, b2, b3, b4, b6, c1, c2, d5	<ul style="list-style-type: none"> <li>(graphical and tabular representation, general equations of drug concentration</li> </ul>	2	6

			<p>in plasma at a given time, determination of rates constant, volume of distribution, half-life, clearance and other pharmacokinetic data) <b>with Solved and homework problems</b> for</p> <p><b>1- I.V. single bolus</b></p> <ul style="list-style-type: none"> <li>• <b>Blood data</b></li> <li><input type="checkbox"/> One-compartment : first-order elimination, zero order elimination</li> <li><input type="checkbox"/> Two compartment: first-order elimination, zero order elimination</li> </ul> <p><b>Urine data</b></p> <li><input type="checkbox"/> One-compartment : first-order elimination, zero order elimination, excretion rate versus time, ARE versus time</li>		
MID-TERM EXAM				1	3
4 (II)	<b>Pharmacokinetics of drugs given by intravenous administration</b>		<p><b>2. I.V. multiple dosing :</b> One-compartment assuming first order elimination , specific data (Cmax, Cmin, Cmax<math>\infty</math>, Cmin<math>\infty</math>, CP<math>\infty</math>, CSS,</p> <ul style="list-style-type: none"> <li>• <b>3. I.V. infusion: one-compartment model:</b> specific data (rate of infusion(R), steady state concentration C<sub>ss</sub>, maintenance dose D<sub>m</sub>, loading dose DL) . General equations and how to determine specific data and substantial data (half-life (t 1/2), clearance (Cl), volume of distribution, (Vd))</li> </ul> <p>When the rate of infusion is constant , the rate of infusion changes, when I.V. bolus</p>	2	6
5	<b>Pharmacokinetics of drugs given by extravascular administration (oral,</b>	a1, b1, b2, b3, b4, b6c1, c2, d5	<ul style="list-style-type: none"> <li>• graphical and tabular representation of pharmacokinetic data</li> <li>• (graphical and tabular</li> </ul>	2	

	intramuscular, sublingual, buccal, rectal, etc)		<p>representation, general equations of drug concentration in plasma at a given time, determination of rates constant, volume of distribution, half-life, clearance and other pharmacokinetic data)</p> <p><b>with Solved and homework problems</b> for</p> <p><b>1. extravascular Single dosing</b></p> <ul style="list-style-type: none"> <li>• (A) <b>Blood data</b></li> <li>• Definitions of Specific data of absorption phase: <math>K_a</math>, <math>F</math>, <math>C_{max}</math>, <math>T_{max}</math>, <math>D_{ab}</math>, <math>D_{ab\infty}</math>, <math>f_{ab}</math> (fraction absorbed), <math>f_{ua}</math> (fraction unabsorbed),</li> <li>• o Determination of elimination rate constant and half-life from the last points of elimination phase</li> <li>• o determination of <math>K_a</math> by residual method from</li> <li>• <math>C_p</math> versus time curve.</li> <li>• o determination of <math>C_{max}</math>, <math>T_{max}</math>, mathematically</li> <li>• o determination of <math>D_{ab}</math>, <math>D_{ab\infty}</math>, <math>f_{ab}</math>, <math>f_{ua}</math></li> <li>• o determination of <math>K_a</math> by Wagner – Nelson method from</li> <li>• <math>f_{ua}</math> versus time curve</li> </ul> <p><b>(B) Urine data</b></p> <ul style="list-style-type: none"> <li>• <input type="checkbox"/> One-compartment : first-order elimination, zero order elimination, ARE versus time</li> </ul> <p><b>2. extravascular multiple dosing :</b>        One-compartment assuming first order elimination: One-compartment assuming first order elimination , specific data (<math>C_{max}</math>, <math>C_{min}</math>, <math>C_{max\infty}</math>, <math>C_{min\infty}</math>, <math>CP_{\infty}</math>, <math>CSS</math>, )</p>		6
6	<b>Clinical Pharmacokinetics</b>	a1, b1, b2, b3, b4, b5, b6, b7,	<ul style="list-style-type: none"> <li>• (i) Loading and maintenance doses</li> <li>• (ii) Doses and dosage interval at change from I.V. infusion</li> </ul>	2	

	b8, c1, c2, d5	to oral administration. <ul style="list-style-type: none"> <li>(iii) Changes in plasma concentration with change in route of administration. Dose based on creatinine clearance</li> <li>(iv) Dose in the elderly</li> <li>(v) <b>Determination of absolute ad relative bioavailability</b> from blood and urine data</li> </ul>		6
<b>Course Review</b>	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2	Review of the course topics by discussion session.	1	3
FINAL - EXAM			1	3
<b>TOTAL</b>			16	48
<b>Number of Weeks /and Units Per Semester</b>			16 weeks	6 Units

## V. Teaching strategies of the course:

**lecture - Discussion:** a short lecture/ address followed by discussion

**Feed-back learning:** students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve mathematical problems during Tutorial at the class .	b2, b3, b4, b5, b6, b7, d5	4-13	6
2	<b>Group :</b> each group of students will be assigned to solve mathematical problems as homework.	b2, b3, b4, b5, b6, b7, d1	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2
2	Assignments (1 + 2)	4-13, 14	10	10	a1, b2, b4, c1, d1, d2
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b3, b4, b5, b6, b7, d5
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, b1, b2, b3, b4, b6, , c1, c2, d5
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2
TOTAL			100	100 %	

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
<ol style="list-style-type: none"> <li>1. Shargel. Biopharmaceutics and pharmacokinetics, 2002, McGraw Hill Inc</li> <li>2. Malcolm Rowland. Clinical pharmacokinetics: concepts an applications, 1996, Lippincott's Williams &amp; Wilkins</li> </ol>
<b>2- Essential References.</b>
<ol style="list-style-type: none"> <li>1. Wagner. Pharmacokinetics for the pharmaceutical scientist</li> <li>2. Venkaeswarlu. Biopharmaceutics and pharmacokinetics</li> </ol>
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PUBLIC HEALTH & FIRST AID

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	PUBLIC HEALTH & FIRST AID					
2.	Course Code & Number:	PHRE 03					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( Fifth ) Year – ( 2 <sup>nd</sup> ) semester					
5.	Pre –requisite (if any):	Introduction to pharmacy profession					
6.	Co –requisite (if any):	---					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course deals with the study of basic issues relate to health of the community.  
 Besides, the course provides necessary knowledge of how to provide aid to injured and accidental causalities..



<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A1	a1. Define health, epidemiology, epidemic diseases and recognize the factors affecting personal and community health
2.	A3	a2. Discuss the principles of prevention of epidemic diseases in a community.
3.		a3. Discuss the concept of primary health care and first aid.
4.		a4. Identify the procedures to be carried out in first aid of different types of accidents and injuries.
5.	A4	a5. Comprehend his/her role as a pharmacist to implement and participate in primary health care and epidemic-diseases control programs and in assisting health care team to provide first aid services.
6.	B2	b1. Compare between procedures of first-aid of various injuries and accidents.
7.	C4	c1. Search efficiently for information using documented and electronic sources of information.
8.	C4	c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
9.	D1	d1. Share successfully in team-work.
10.	D2	d2. Show respect to life and commit to community and patients serving.
11.	D3	d3. Communicate effectively with his/her colleagues, members of health care team, patients and community
12.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
13.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3 , a4, a5	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1,	Lecture	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	Feed-back learning	Assignments

IV. Course Content:						
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours	
1	<b>Introduction</b>	a1, a5	<ul style="list-style-type: none"> <li>Definitions : health , public health</li> <li>Concept of health ,public health</li> <li>Factors affecting personal and public health : (personal hygiene, hereditary ,environment ,life style ,socioeconomic condition)</li> </ul>	2	4	
2	<b>Primary health care</b>	a3	<ul style="list-style-type: none"> <li>Objectives</li> <li>Methods</li> <li>programs</li> </ul>	2	4	
3	<b>Prevention of Epidemic diseases</b>	a1, a2, a5	<ul style="list-style-type: none"> <li>definition of Epidemiology, Epidemic diseases</li> <li>Objectives of epidemiology studies and preventive programs</li> <li>role of pharmacist in assisting health care team in preventive programs</li> <li>Examples of studies and preventive programs of epidemic diseases :\               <ul style="list-style-type: none"> <li>○ Malaria</li> <li>○ TB</li> <li>○ Bilharziasis</li> </ul> </li> </ul>	2	4	
				<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> <li>Post-exam discussion</li> </ul>	1	2
	<b>Prevention of Epidemic diseases</b>	a2	Examples of studies and preventive programs of epidemic diseases :\ <ul style="list-style-type: none"> <li>○ Rabies</li> <li>○ Leprosy</li> <li>○ Hepatitis</li> <li>○ AIDS and other sexual transmitted disease</li> </ul>	2	4	
4	<b>Introduction to first-aid</b>	a1, a5	<ul style="list-style-type: none"> <li>Definition, concept and history of fist aid</li> <li>objectives and responsibilities of first aid</li> </ul>	1	2	

			<ul style="list-style-type: none"> <li>role of pharmacist in assisting health care team in providing first-aid to patients.</li> </ul>		
5	<b>First aid of various accidents and injuries and conditions</b>	a4, b1	<ul style="list-style-type: none"> <li>first-aid of fractures and dislocation</li> <li>first-aid of bleeding &amp; shock</li> <li>first-aid of burns &amp; sunburn &amp; frost</li> <li>first-aid of animal bites, stings</li> <li>first-aid of drowning and asphyxia</li> <li>first-aid of epileptic seizures</li> <li>first-aid of diabetic coma</li> <li>first-aid of poisoning</li> </ul>	4	8
	<b>Course Review</b>	a1, a2, a3, a4, a5, b1, , , , d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to provide a search-based report on an epidemiology study of a disease	c1, c2, d5	4-13	6
2	<b>Group :</b> each group of students will be assigned to provide a search-based report for comparison of first-aid procedures of related-diseases and accidents	b1, c1, c2, d1, d3, d5	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, , , , d2
2	Assignments (1 + 2)	4, 14	10	10	b1, c1, c2, d1, d4, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b1,
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, a5, b1, , , , d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a5, b1, , , , d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. David Pencheon. Oxford handbook of public health Practice 2. القواعد العامة للاسعافات الأولية / د/ محمد ابراهيم شلبي
<b>2- Essential References.</b>
1. N. Muruges Health Education and community pharmacy
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
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5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of

### PUBLIC HEALTH & FIRST AID

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
<p>The course deals with the study of basic issues relate to health of the community.</p> <p>Besides, the course provides necessary knowledge of how to provide aid to injured and accidental casualties..</p>

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A1	a1. Define health, epidemiology, epidemic diseases and recognize the factors affecting personal and community health
2.	A3	a2. Discuss the principles of prevention of epidemic diseases in a community.
3.		a3. Discuss the concept of primary health care and first aid.
4.		a4. Identify the procedures to be carried out in first aid of different types of accidents and injuries.
5.	A4	a5. Comprehend his/her role as a pharmacist to implement and participate in primary health care and epidemic-diseases control programs and in assisting health care team to provide first aid services.
6.	B2	b1. Compare between procedures of first-aid of various injuries and accidents.
7.	C4	c1. Search efficiently for information using documented and electronic sources of information.
8.	C4	c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
9.	D1	d1. Share successfully in team-work.
10.	D2	d2. Show respect to life and commit to community and patients serving.
11.	D3	d3. Communicate effectively with his/her colleagues, members of health care team, patients and community
12.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
13.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.



<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3 , a4, a5	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
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<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
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<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	Feed-back learning	Assignments

IV. Course Content:						
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours	
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2	<b>Primary health care</b>	a3	<ul style="list-style-type: none"> <li>Objectives</li> <li>Methods</li> <li>programs</li> </ul>	2	4	
3	<b>Prevention of Epidemic diseases</b>	a1, a2, a5	<ul style="list-style-type: none"> <li>definition of Epidemiology, Epidemic diseases</li> <li>Objectives of epidemiology studies and preventive programs</li> <li>role of pharmacist in assisting health care team in preventive programs</li> <li>Examples of studies and preventive programs of epidemic diseases :\               <ul style="list-style-type: none"> <li>○ Malaria</li> <li>○ TB</li> <li>○ Bilharziasis</li> </ul> </li> </ul>	2	4	
				<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> <li>Post-exam discussion</li> </ul>	1	2
	<b>Prevention of Epidemic diseases</b>	a2	Examples of studies and preventive programs of epidemic diseases :\ <ul style="list-style-type: none"> <li>○ Rabies</li> <li>○ Leprosy</li> <li>○ Hepatitis</li> <li>○ AIDS and other sexual transmitted disease</li> </ul>	2	4	
4	<b>Introduction to first-aid</b>	a1, a5	<ul style="list-style-type: none"> <li>Definition, concept and history of fist aid</li> <li>objectives and responsibilities of first aid</li> </ul>	1	2	

			<ul style="list-style-type: none"> <li>role of pharmacist in assisting health care team in providing first-aid to patients.</li> </ul>		
5	<b>First aid of various accidents and injuries and conditions</b>	a4, b1	<ul style="list-style-type: none"> <li>first-aid of fractures and dislocation</li> <li>first-aid of bleeding &amp; shock</li> <li>first-aid of burns &amp; sunburn &amp; frost</li> <li>first-aid of animal bites, stings</li> <li>first-aid of drowning and asphyxia</li> <li>first-aid of epileptic seizures</li> <li>first-aid of diabetic coma</li> <li>first-aid of poisoning</li> </ul>	4	8
	<b>Course Review</b>	a1, a2, a3, a4, a5, b1, , , , d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

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## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to provide a search-based report on an epidemiology study of a disease	c1, c2, d5	4-13	6
2	<b>Group :</b> each group of students will be assigned to provide a search-based report for comparison of first-aid procedures of related-diseases and accidents	b1, c1, c2, d1, d3, d5	14	4

## VIII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1,d2
2	Assignments (1 + 2)	4, 14	10	10	b1, c1, c2, d1, d4, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b1,
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, a5, b1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a5, b1, d2
TOTAL			100	100 %	100

## IX. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. David Pencheon. Oxford handbook of public health Practice 2. القواعد العامة للاسعافات الأولية / د/ محمد ابراهيم شلبي
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1. N. Murugesh Health Education and community pharmacy
<b>3- Electronic Materials and Web Sites etc.</b>
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5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PROFESSIONAL ETHICS & REGULATIONS

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	PROFESSIONAL ETHICS & REGULATIONS					
2.	Course Code & Number:	MSC 13					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( Fifth ) Year – ( 2 <sup>nd</sup> ) semester					
5.	Pre –requisite (if any):	Introduction to pharmacy profession					
6.	Co –requisite (if any):	---					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10.	Prepared By:						
11.	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of local and global regulations controlling the medical professions. Besides, the course provides code of ethics the medical professionals should consider during practicing of their professions.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A1	a1. Define the rights of patients that should be considered during practicing medical profession.
2.	A3	a2. Define acts, regulations, laws code of ethics
3.		a3. Discuss the code of ethics, regulations and acts controlling the medical professions in Yemen , Arabic countries and globally.
4.		a4. Identify the main organizations controlling code of ethics in Yemen, Arabic countries and Globally.
5.	A4	a5. Comprehend his/her role as a pharmacist to implement and obey regulations and acts of medical professions.
6.	B2	b1. Compare between local, Arabic and international code of ethics and regulations of medical professions.
7.	B3	b2. Predict the patient right that should be considered by comprehending the code of ethics.
8.	C4	c1 .Search efficiently for information using documented and electronic sources of information.
9.	C4	c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
10.	D1	d1. Share successfully in team-work.
11.	D2	d2. Show respect to life and commit to community and patients serving.
12.	D3	d3. Communicate effectively with his/her colleagues, members of health care team, patients and community
13.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
14.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3 , a4, a5	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	Feed-back learning	Assignments



<b>IV. Course Content:</b>					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a2, a5, d2	<ul style="list-style-type: none"> <li>• Definition of regulations, act, laws</li> <li>• History of medical regulations</li> <li>• Patients Rights</li> </ul>	3	6
2	<b>Patients and professional Rights</b>	a1, a5, b2, d2	<ul style="list-style-type: none"> <li>• Patient rights</li> <li>• Medical workers rights</li> </ul>	2	4
3	<b>Professional organization</b>	a4, a5, d2	for medical ethics and regulation : <ul style="list-style-type: none"> <li>• Local</li> <li>• Arabic</li> <li>• International</li> </ul>	2	4
			<ul style="list-style-type: none"> <li>• MID-TERM EXAM</li> <li>• Post-exam discussion</li> </ul>	1	2
4	<b>Code of Ethics</b>	a3, a5, b1, d2	for medical professions and regulation : <ul style="list-style-type: none"> <li>• Old (Oath of Hippocrates)</li> <li>• Arab countries</li> <li>• Asian</li> <li>• Europe</li> <li>• USA</li> <li>• Local (Yemeni) Code of ethics</li> </ul>	4	6
5	<b>Regulations of medical professions</b>	a3, a5, b2, d2	Regulations and acts controlling medical professions : <ul style="list-style-type: none"> <li>• Local (Yemeni)</li> <li>• Arabic</li> <li>• Global e.g. USA , Europe</li> </ul>	2	8
	<b>Course Review</b>	a1, a2, a3, a4, a5, b1, , b2, b2, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				<b>16</b>	<b>32</b>
<b>Number of Weeks /and Units Per Semester</b>				<b>16 weeks</b>	<b>5 Units</b>

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.

The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report on one code of ethics in one Arabian country	c1, c2, d5	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report for comparison of regulations of medical professions between different countries	b1, c1, c2, d1, d3, d5	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, , b2, b2, d2
2	Assignments (1 + 2)	4, 14	10	10	b1, c1, c2, d1, d4, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, a5, b1, , b2, b2, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a5, b1, , b2, b2, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Agarwal. pharmaceutical jurisprudence & Ethics
2. code of ethics, council of health ministers in Arab gulf countries, 2009
- 3.

### 2- Essential References.

1. code of ethics, pharmacy council of New Zealand, 2011
2. 2009 Iowa code chapter 155a Iowa pharmacy practice act, USA

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

### IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of

### PROFESSIONAL ETHICS & REGULATIONS

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

III. Course Description:
The course deals with the study of local and global regulations controlling the medical professions. Besides, the course provides code of ethics the medical professionals should consider during practicing of their professions.

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>3. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A1	a1. Define the rights of patients that should be considered during practicing medical profession.
2.	A3	a2. Define acts, regulations, laws code of ethics
3.		a3. Discuss the code of ethics, regulations and acts controlling the medical professions in Yemen , Arabic countries and globally.
4.		a4. Identify the main organizations controlling code of ethics in Yemen, Arabic countries and Globally.
5.	A4	a5. Comprehend his/her role as a pharmacist to implement and obey regulations and acts of medical professions.
6.	B2	b1. Compare between local, Arabic and international code of ethics and regulations of medical professions.
7.	B3	b2. Predict the patient right that should be considered by comprehending the code of ethics.
8.	C4	c1 .Search efficiently for information using documented and electronic sources of information.
9.	C4	c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
10.	D1	d1. Share successfully in team-work.
11.	D2	d2. Show respect to life and commit to community and patients serving.
12.	D3	d3. Communicate effectively with his/her colleagues, members of health care team, patients and community
13.	D4	d4. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
14.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>4. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3 , a4, a5	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	Feed-back learning	Assignments

<b>V. Course Content:</b>					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a2, a5, d2	<ul style="list-style-type: none"> <li>• Definition of regulations, act, laws</li> <li>• History of medical regulations</li> <li>• Patients Rights</li> </ul>	3	6
2	<b>Patients and professional Rights</b>	a1, a5, b2, d2	<ul style="list-style-type: none"> <li>• Patient rights</li> <li>• Medical workers rights</li> </ul>	2	4
3	<b>Professional organization</b>	a4, a5, d2	for medical ethics and regulation : <ul style="list-style-type: none"> <li>• Local</li> <li>• Arabic</li> <li>• International</li> </ul>	2	4
			<ul style="list-style-type: none"> <li>• MID-TERM EXAM</li> <li>• Post-exam discussion</li> </ul>	1	2
4	<b>Code of Ethics</b>	a3, a5, b1, d2	<ul style="list-style-type: none"> <li>• for medical professions and regulation :</li> <li>• Old (Oath of Hippocrates)</li> <li>• Arab countries</li> <li>• Asian</li> <li>• Europe</li> <li>• USA</li> <li>• Local (Yemeni) Code of ethics</li> </ul>	4	6
5	<b>Regulations of medical professions</b>	a3, a5, b2, d2	Regulations and acts controlling medical professions : <ul style="list-style-type: none"> <li>• Local (Yemeni)</li> <li>• Arabic</li> <li>• Global e.g. USA , Europe</li> </ul>	2	8
	<b>Course Review</b>	a1, a2, a3, a4, a5, b1, , b2, b2, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5



## VI. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VII. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report on one code of ethics in one Arabian country	c1, c2, d5	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report for comparison of regulations of medical professions between different countries	b1, c1, c2, d1, d3, d5	14	4

### VIII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, , b2, b2, d2
2	Assignments (1 + 2)	4, 14	10	10	b1, c1, c2, d1, d4, d5
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, a5, b1, , b2, b2, d2
5	Final exam of theoretical part ( written exam)	16	60	60	a1, a2, a3, a4, a5, b1, , b2, b2, d2
TOTAL			100	100 %	100

### IX. Learning Resources:

#### 1- Required Textbook(s) ( maximum two ).

4. Agarwal. pharmaceutical jurisprudence & Ethics
5. code of ethics, council of health ministers in Arab gulf countries, 2009
- 6.

#### 2- Essential References.

3. code of ethics, pharmacy council of New Zealand, 2011
4. 2009 Iowa code chapter 155a Iowa pharmacy practice act, USA

#### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## X. Course Policies:

5.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
6.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
7.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
8.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PHARMACEUTICAL MARKETING

<b>I. Course Identification and General Information:</b>							
1.	Course Title:	PHARMACEUTICAL MARKETING					
2.	Course Code & Number:	PHRT 25					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( Fifth ) Year – ( 2 <sup>nd</sup> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>• Introduction to pharmacy profession</li> </ul>					
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>• Pharmacoeconomics</li> </ul>					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course is designed to provide the students with knowledge and skills of pharmaceutical marketing necessary for their profession as marketing men/women for the drug companies

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A3	a1. Define markets, marketing, promotion, promotional materials, products, competitors, customers, marketing targets, plan and planning.
2.		a2. Discuss the requirement (knowledge and skills) of successful marketing,
3.		a3. Recognize customers need.
4.		a4. Identify the basic characteristics of marketing of pharmaceutical products and its differences from marketing of other products.
5.	A4	a5. Comprehend his/her role as a pharmacist to market pharmaceutical products.
6.	B2	b1. Compare between different types of customers and how to deal with each type.
7.	C3	c1. Demonstrate skills of marketing in role play and in Job applications
8.	C4	c2 .Search efficiently for information using documented and electronic sources of information.
9.	C4	c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
10.	D1	d1. Share successfully in team-work.
11.	D2	d2. Communicate effectively with his/her colleagues, members of health care team, patients and community
12.	D3	d3. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
13.	D5	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>2. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2 , a3, a4	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	lecture-discussion	Written exam, assignments
c2, c3	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d4	Feed-back learning	Assignments

IV. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to marketing</b>	a1	<ul style="list-style-type: none"> <li>• definitions, (markets, marketing, promotion, promotional materials, products, competitors, customers, marketing targets, plan and planning</li> <li>• Significance and objectives of marketing</li> </ul>	2	4
2	<b>Requirements of a successful marketing</b>	a2	<ul style="list-style-type: none"> <li>• personnel, mental, skills communication and relationship building</li> <li>• Strategy of marketing: planning, execution, evaluation</li> <li>• Designing a marketing plan</li> </ul>	3	6
3	<b>Understanding the customers</b>	a3, b1	<ul style="list-style-type: none"> <li>• Types of customers</li> <li>• Dealing with customers</li> <li>• customers need and satisfaction</li> </ul>	2	4
			<ul style="list-style-type: none"> <li>• MID-TERM EXAM</li> <li>• Post-exam discussion</li> </ul>	1	2
4	<b>Pharmaceutical marketing</b>	a4, a5,	<ul style="list-style-type: none"> <li>• significance</li> <li>• Who is the med. Rep. ?</li> <li>• ethical issues</li> <li>• Pharmaceutical products: differences from other products, essential information to be full known on pharmaceutical products (pharmaceutical, pharmacological, commercial )properties</li> <li>• Pharmaceutical Promotional materials: brochures, gifts, charts, etc.</li> </ul>	3	6
5	<b>Role play:</b>	c1	<ul style="list-style-type: none"> <li>• <b>Training on visiting to customers (physicians) :</b> pre-visit preparation ad skills of effective visit (meeting, opening, offering, closing), post-visit evaluation</li> </ul>	2	4

6	<b>Self-marketing { C.V. Job applications and interview }</b>	c1	<ul style="list-style-type: none"> <li>How to prepare C.V.</li> <li>Requirements of successful job application and interview</li> </ul>	1	2
	<b>Course Review</b>	a1, a2, a3, a4, a5, b1, c1	Review of course topics	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>



## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to prepare his/her own C.V	c2, c3, d4	4-13	6
2	<b>Group :</b> each group of students will be assigned to provide a search-based report for comparison of different marketing strategies	b1, c2, c3, d1, d2, d4	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, c1
2	Assignments (1 + 2)	4, 14	10	10	b1, c2, c3, d1, d2, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b1
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, a5, b1, c1
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a5, b1, c1
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Ross Mulner. Pharmaceutical marketing, Journal of Consumer Marketing, 2005

### 2- Essential References.

1. Handbook of pharmaceutical marketing
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

<b>IX.Course Policies:</b>	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of

### PHARMACEUTICAL MARKETING

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

### III. Course Description:

The course is designed to provide the students with knowledge and skills of pharmaceutical marketing necessary for their profession as marketing men/women for the drug companies

<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>3. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	A3	a1. Define markets, marketing, promotion, promotional materials, products, competitors, customers, marketing targets, plan and planning.
2.		a2. Discuss the requirement (knowledge and skills) of successful marketing,
3.		a3. Recognize customers need.
4.		a4. Identify the basic characteristics of marketing of pharmaceutical products and its differences from marketing of other products.
5.	A4	a5. Comprehend his/her role as a pharmacist to market pharmaceutical products.
6.	B2	b1. Compare between different types of customers and how to deal with each type.
7.	C3	c1. Demonstrate skills of marketing in role play and in Job applications
8.	C4	c2 .Search efficiently for information using documented and electronic sources of information.
9.	C4	c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
10.	D1	d1. Share successfully in team-work.
11.	D2	d2. Communicate effectively with his/her colleagues, members of health care team, patients and community
12.	D3	d3. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
13.	D5	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

<b>4. Alignment CILOs to teaching strategies and assessment strategies</b>		
<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2 , a3, a4	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	lecture-discussion	Written exam, assignments
c2, c3	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d4	Feed-back learning	Assignments

V. Course Content:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to marketing</b>	a1	<ul style="list-style-type: none"> <li>definitions, (markets, marketing, promotion, promotional materials, products, competitors, customers, marketing targets, plan and planning</li> <li>Significance and objectives of marketing</li> </ul>	2	4
2	<b>Requirements of a successful marketing</b>	a2	<ul style="list-style-type: none"> <li>personnel, mental, skills communication and relationship building</li> <li>Strategy of marketing: planning, execution, evaluation</li> <li>Designing a marketing plan</li> </ul>	3	6
3	<b>Understanding the customers</b>	a3, b1	<ul style="list-style-type: none"> <li>Types of customers</li> <li>Dealing with customers</li> <li>customers need and satisfaction</li> </ul>	2	4
			<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> <li>Post-exam discussion</li> </ul>	1	2
4	<b>Pharmaceutical marketing</b>	a4, a5,	<ul style="list-style-type: none"> <li>significance</li> <li>Who is the med. Rep. ?</li> <li>ethical issues</li> <li>Pharmaceutical products: differences from other products, essential information to be full known on pharmaceutical products (pharmaceutical, pharmacological, commercial )properties</li> <li>Pharmaceutical Promotional materials: brochures, gifts, charts, etc.</li> </ul>	3	6
5	<b>Role play:</b>	c1	<ul style="list-style-type: none"> <li><b>Training on visiting to customers (physicians) :</b> pre-visit preparation ad skills of effective visit (meeting, opening, offering, closing), post-visit</li> </ul>	2	4

			evaluation		
6	<b>Self-marketing { C.V. Job applications and interview}</b>	c1	<ul style="list-style-type: none"> <li>• How to prepare C.V.</li> <li>• Requirements of successful job application and interview</li> </ul>	1	2
	<b>Course Review</b>	a1, a2, a3, a4, a5, b1, c1	Review of course topics	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units

## VI. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

VII. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to prepare his/her own C.V	c2, c3, d4	4-13	6
2	<b>Group :</b> each group of students will be assigned to provide a search-based report for comparison of different marketing strategies	b1, c2, c3, d1, d2, d4	14	4

VIII. Schedule of Assessment Tasks for Students During the Semester					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, c1
2	Assignments (1 + 2)	4, 14	10	10	b1, c2, c3, d1, d2, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b1
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, a5, b1, c1
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a5, b1, c1
TOTAL			100	100 %	100



## IX. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Ross Mulner. Pharmaceutical marketing, Journal of Consumer Marketing, 2005
<b>2- Essential References.</b>
1. Handbook of pharmaceutical marketing
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## X. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### PHARMACOECONOMICS

<b>I. I. Course Identification and General Information:</b>							
1.	Course Title:	PHARMACOECONOMICS					
2.	Course Code & Number:	PHRT 24					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		1	1	-	-		-
4.	Study level/ semester at which this course is offered:	( FIFTH ) Year – ( 1 <sup>ST</sup> ) semester					
5.	Pre –requisite (if any):	• Mathematics					
6.	Co –requisite (if any):	NONE					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10.	Prepared By:						
11.	Date of Approval	<b>10/2014</b>					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

<b>III. Course Description:</b>
<p>The course deals study of the study of measuring and comparing the costs of therapies and medical care services individually or in healthcare facilities and determining which alternative produces the best health outcome for the available budget .</p>

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A3	a1. Discuss the basic pharmacoeconomic principles and analytical methods commonly used during his/her practicing the profession.
2.		a2. Define pharmacoeconomic, cost, effectiveness, benefit, perspectives and comprehend the main pharmacoeconomic objectives.
3.	B1	b1. Interpret the outcomes of pharmacoeconomic analysis.
4.	B2	b2. Solve pharmacoeconomic related problems.
5.	B3	b3. Compare between various types of outcomes and between different methods of pharmacoeconomic analysis.
6.	B4	b4. Use the serial thinking to find the solution of pharmacoeconomic problems.
7.	C1	c1. Operate and use scientific calculator correctly.
8.	C2	c2. Apply equations and rules to solve pharmacoeconomic problems
9.	D1	d1. Share successfully in team-work.
10.	D5	d2. Demonstrate time management during solving pharmacoeconomic problems

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture-discussion,, feed-back learning,	written exam

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	feed-back learning, Group-project.	Written exam
b2	Lecture-discussion, feed-back learning	written exam, quizzes,

		assignment
b3, b4	Lecture-discussion	written exam , quiz
<b>(C) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
c1	Lecture-discussion	Written exam
c2	Feed-back learning	Written exam
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
d1	Lecture-discussion	Assignment
d2	Lecture-discussion	Quiz

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a2	<ul style="list-style-type: none"> <li>definition of (economy, pharmacoeconomic, cost, effectiveness, benefit)</li> <li>history , significance and objectives of Pharmacoeconomics</li> <li>relation between Pharmacoeconomics and pharmaceutical care</li> </ul>	2	4
2	<b>Cost &amp; Perspectives</b>	a2, b1, b2, b4, c1, d2	<ul style="list-style-type: none"> <li>Types of costs : apparent cost, true cost, present cost, future cost with solving problems</li> <li>Types of perspective (patient perspective, payer perspective, Societal perspective)</li> </ul>	2	4
3	<b>Outcomes of medical therapies</b>	b1, b3	<ul style="list-style-type: none"> <li>Types of outcomes : Economic outcomes. Clinical outcomes, humanistic outcomes.</li> <li>Expression of outcomes: effectiveness, benefit, utility (Quality of life), etc</li> </ul>	2	4
	<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> </ul>			1	2
4	<b>Steps and types of pharmacoeconomic analysis</b>	a1, b1, b2, b3, b4, c1	<ul style="list-style-type: none"> <li>Define objectives</li> <li>Determine perspective</li> <li>Select analysis method               <ul style="list-style-type: none"> <li>COI (cost of illness)</li> <li>CEA (cost-effectiveness analysis)</li> <li>CBA( cost-benefit analysis)</li> <li>CUA( cost-utility</li> </ul> </li> </ul>	7	14

		analysis) with solving problems for each type		
			1	2
<b>Course Review</b>	a1, a2, b1, b2,b3 b4, c1	Review of the course topics by discussion session.	1	2
FINAL - EXAM			1	2
<b>TOTAL</b>			16	32
<b>Number of Weeks /and Units Per Semester</b>			16 weeks	4 Units

## V. Teaching strategies of the course:

**lecture - Discussion:** a short lecture/ address followed by discussion

**Seminars:** these are mainly used with small groups of students (20-30) students in which they find better chances for discussing and participating in the teaching process.

**Feed-back learning:** students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve pharmaco-economic problems during Tutorial at the class .	b2, b3, b4, c1, d2	4-13	6
2	<b>Group :</b> each group of students will be assigned to solve pharmaco-economic problems during as homework	b2, b3, b4, c1, d1	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, b1, b2,b3 b4, c1
2	Assignments (1 + 2)	4-13, 14	10	10	b2,b3, b4, c1, d2
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, b1, b2,b3 b4, c1
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, b1, b2,b3 b4, c1
TOTAL			100	100 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Brian L. Strom. Textbook of pharmacoepidemiology. Chapter 22: Pharmacoeconomics: Economic Evaluation of Pharmaceuticals, 2006, John Wiley & Sons Ltd

### 2- Essential References.

1. Diprio Pharmacotherapy pathophysiologic approaches : Pharmacoeconomics, 2010

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

IX.Course Policies:	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of PHARMACOECONOMICS

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

IV. Course Description:
The course deals study of the study of measuring and comparing the costs of therapies and medical care services individually or in healthcare facilities and determining which alternative produces the best health outcome for the available budget .

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 3. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A3	a1. Discuss the basic pharmacoeconomic principles and analytical methods commonly used during his/her practicing the profession.
2.		a2. Define pharmacoeconomic, cost, effectiveness, benefit, perspectives and comprehend the main pharmacoeconomic objectives.
3.	B1	b1. Interpret the outcomes of pharmacoeconomic analysis.
4.	B2	b2. Solve pharmacoeconomic related problems.
5.	B3	b3. Compare between various types of outcomes and between different methods of pharmacoeconomic analysis.
6.	B4	b4. Use the serial thinking to find the solution of pharmacoeconomic problems.
7.	C1	c1. Operate and use scientific calculator correctly.
8.	C2	c2. Apply equations and rules to solve pharmacoeconomic problems
9.	D1	d1. Share successfully in team-work.
10.	D5	d2. Demonstrate time management during solving pharmacoeconomic problems

#### 4. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture-discussion,, feed-back learning,	written exam

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	feed-back learning, Group-project.	Written exam
b2	Lecture-discussion, feed-back learning	written exam, quizzes,

		assignment
b3, b4	Lecture-discussion	written exam , quiz
<b>(C) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
c1	Lecture-discussion	Written exam
c2	Feed-back learning	Written exam
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
d1	Lecture-discussion	Assignment
d2	Lecture-discussion	Quiz

<b>V. Course Content:</b>					
<b>O r d e r</b>	<b>Units/ Topics List</b>	<b>CILOs</b>	<b>Sub Topics List</b>	<b>No. of Weeks</b>	<b>contact hours</b>
1	<b>Introduction</b>	a1, a2	<ul style="list-style-type: none"> <li>definition of (economy, pharmaco-economic, cost, effectiveness, benefit)</li> <li>history , significance and objectives of Pharmacoeconomics</li> <li>relation between Pharmacoeconomics and pharmaceutical care</li> </ul>	2	4
2	<b>Cost &amp; Perspectives</b>	a2, b1, b2, b4, c1, d2	<ul style="list-style-type: none"> <li>Types of costs : apparent cost, true cost, present cost, future cost with solving problems</li> <li>Types of perspective (patient perspective, payer perspective, Societal perspective)</li> </ul>	2	4
3	<b>Outcomes of medical therapies</b>	b1, b3	<ul style="list-style-type: none"> <li>Types of outcomes : Economic outcomes. Clinical outcomes, humanistic outcomes.</li> <li>Expression of outcomes: effectiveness, benefit, utility (Quality of life), etc</li> </ul>	2	4
	<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> </ul>			1	2
4	<b>Steps and types of pharmaco-economic analysis</b>	a1, b1, b2, b3, b4, c1	<ul style="list-style-type: none"> <li>Define objectives</li> <li>Determine perspective</li> <li>Select analysis method               <ul style="list-style-type: none"> <li>COI (cost of illness)</li> <li>CEA (cost-effectiveness analysis)</li> <li>CBA( cost-benefit analysis)</li> <li>CUA( cost-utility analysis)</li> </ul> </li> <li>with solving problems for</li> </ul>	7	14

		each type		
			1	2
<b>Course Review</b>	a1, a2, b1, b2,b3 b4, c1	Review of the course topics by discussion session.	1	2
FINAL - EXAM			1	2
<b>TOTAL</b>			16	32
<b>Number of Weeks /and Units Per Semester</b>			16 weeks	4 Units

## VI. Teaching strategies of the course:

**lecture - Discussion:** a short lecture/ address followed by discussion

**Seminars:** these are mainly used with small groups of students (20-30) students in which they find better chances for discussing and participating in the teaching process.

**Feed-back learning:** students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VII. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve pharmaco-economic problems during Tutorial at the class .	b2, b3, b4, c1, d2	4-13	6
2	<b>Group :</b> each group of students will be assigned to solve pharmaco-economic problems during as homework	b2, b3, b4, c1, d1	14	4

### VIII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, b1, b2,b3 b4, c1
2	Assignments (1 + 2)	4-13, 14	10	10	b2,b3, b4, c1, d2
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, b1, b2,b3 b4, c1
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, b1, b2,b3 b4, c1
TOTAL			100	100 %	

### IX. Learning Resources:

#### 1- Required Textbook(s) ( maximum two ).

1. Brian L. Strom. Textbook of pharmacoepidemiology. Chapter 22: Pharmacoeconomics: Economic Evaluation of Pharmaceuticals, 2006, John Wiley & Sons Ltd

#### 2- Essential References.

1. Diprio Pharmacotherapy pathophysiologic approaches : Pharmacoeconomics, 2010

#### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

<b>X. Course Policies:</b>	
5.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
6.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
7.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
8.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### GRADUATION RESEARCH PROJECT

<b>I. Course Identification and General Information:</b>						
1.	Course Title	GRADUATION RESEARCH PROJECT				
2.	Course Code & Number:	MSC 14				
3.	Credit hours:	C.H			TOTAL	
		Theoretical		P.		Tr.
		L.	Tut.			
		-	1	-		3
4.	Study level/ semester at which this course is offered:	( Fifth ) Year – ( 2 <sup>ND</sup> ) semester				
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>• All specialty courses + Biostatistics</li> </ul>				
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>• None</li> </ul>				
7.	Program (s) in which the course is offered:	All BC programs offered by the university				
8.	Language of teaching the course:	ENGLISH				
9.	Location of teaching the course:	IN THE UNIVERSITY				
10	Prepared By:					
11	Date of Approval	<b>10/2014</b>				

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course is designed to provide the students skills of practicing scientific research



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	B1	b1. Interpret data comes of experimental researches.
2.	B2	b2. Solve problems and find alternatives .
3.	B3	b3. Relate between results and background.
4.	B4	b4. Make conclusions of their experimentations.
5.	C2	c1. Apply knowledge and skills of pharmacy in practicing scientific researches.
6.	C4	c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
7.	D1	d1. Share successfully in team-work.
8.	D2	d2. Show respect to life and commit to community and patients serving.
9.	D3	d3. Communicate effectively with his/her colleagues
10.	D5	d4. Demonstrate time management and self-learning during performing research works .

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3, b4	feed-back learning, Group project	Graduation project assessment (committee assessment)

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c2, c4	feed-back learning, Group project	Graduation project assessment (committee assessment)

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3, d4	Seminar, feed-back learning, Group project	Graduation project assessment (Supervisor assessment)

#### IV. Course Content:

- Each 4-7 students group is assigned to do an experimentation research supervised by a supervisor of the department teaching staff or outside the college.
- The topic of research can be proposed by :
  - The supervisor
  - Or the students after supervisor acceptance
- The topic must be approved by the department council and the college council
- Experiments are carried out in the college laboratories and if necessary outside the college
- The department and the college provide the students with necessary instruments and materials
- The research is to be carried out with the period of the term ( 16 weeks) and must be delivered to the department within that period
- The department propose the name of committee members to the college council . The committee will discuss and judge the research validation as described below in the assessment schedule .

#### V. Teaching strategies of the course:

**Feed-back learning:** students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Schedule of Assessment Tasks for Students During the Semester

Each project will be assessed by a committee of three member as follows

Items	Weight
Project supervisor	70 %
Internal examiner : a member of the department teaching stuff.	15 %
external examiner : a qualified external examiner (either from other departments of the college or from another university)	15 %
<b>Total</b>	<b>100</b>

### Assessment of the project by the project supervisor

Items	Mark
Attendance	35
Attitude and collaboration	35
<b>Total</b>	<b>70</b>

### Assessment of the project by the internal examiner

Items	Mark <sup>1</sup>
Research methodology	5
Research writing	5
Presentation	2
Discussion	3
<b>Total</b>	<b>15</b>

<sup>1</sup>: The whole students team of the projects will be assessed as one unit

### Assessment of the project by the external examiner

Items	Mark <sup>1</sup>
Research methodology	5
Research writing	5
Presentation	2
Discussion	3
<b>Total</b>	<b>15</b>

<sup>1</sup>: The whole students team of the projects will be assessed as one unit

## VII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Variable
<b>2- Essential References.</b>
2. Variable
<b>3- Electronic Materials and Web Sites etc.</b>
Variable

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of GRADUATION RESEARCH PROJECT

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

### III. Course Description:

The course is designed to provide the students skills of practicing scientific research

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 3. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	B1	b1. Interpret data comes of experimental researches.
2.	B2	b2. Solve problems and find alternatives .
3.	B3	b3. Relate between results and background.
4.	B4	b4. Make conclusions of their experimentations.
5.	C2	c1. Apply knowledge and skills of pharmacy in practicing scientific researches.
6.	C4	c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
7.	D1	d1. Share successfully in team-work.
8.	D2	d2. Show respect to life and commit to community and patients serving.
9.	D3	d3. Communicate effectively with his/her colleagues
10.	D5	d4. Demonstrate time management and self-learning during performing research works .

#### 1. Alignment CILOs to teaching strategies and assessment strategies

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3, b4	feed-back learning, Group project	Graduation project assessment (committee assessment)

##### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c2, c4	feed-back learning, Group project	Graduation project assessment (committee assessment)

##### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
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Outcomes		
d1, d2, d3, d4	Seminar, feed-back learning, Group project	Graduation project assessment (Supervisor assessment)

#### IV. Course Content:

- Each 4-7 students group is assigned to do an experimentation research supervised by a supervisor of the department teaching staff or outside the college.
- The topic of research can be proposed by :
  - The supervisor
  - Or the students after supervisor acceptance
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#### V. Teaching strategies of the course:

**Feed-back learning:** students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills



## VI. Schedule of Assessment Tasks for Students

Each project will be assessed by a committee of three member as follows

Items	Weight
Project supervisor	70 %
Internal examiner : a member of the department teaching stuff.	15 %
external examiner : a qualified external examiner (either from other departments of the college or from another university)	15 %
<b>Total</b>	<b>100</b>

### Assessment of the project by the project supervisor

Items	Mark
Attendance	35
Attitude and collaboration	35
<b>Total</b>	<b>70</b>

### Assessment of the project by the internal examiner

Items	Mark <sup>1</sup>
Research methodology	5
Research writing	5
Presentation	2
Discussion	3
<b>Total</b>	<b>15</b>

<sup>1</sup>: The whole students team of the projects will be assessed as one unit

### Assessment of the project by the external examiner

Items	Mark <sup>1</sup>
Research methodology	5
Research writing	5
Presentation	2
Discussion	3
<b>Total</b>	<b>15</b>

<sup>1</sup>: The whole students team of the projects will be assessed as one unit

<b>VII. Learning Resources:</b>	
<b>1- Required Textbook(s) ( maximum two ).</b>	
3. Variable	
<b>2- Essential References.</b>	
4. Variable	
<b>3- Electronic Materials and Web Sites etc.</b>	
Variable	

<b>IX. Course Policies:</b>	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
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