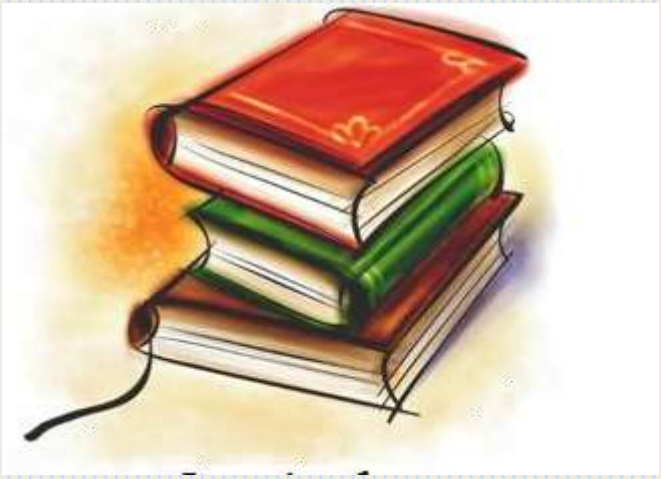
Kingdom of Saudi Arabia
Ministry of Higher Education
King Faisal University
College of Clinical Pharmacy

Pharm. D. Study Plan

2012-2013



College of Clinical Pharmacy,
King Faisal University, Al-Ahsa -31982
Kingdom of Saudi Arabia

Pharm D Study Plan

Pharm. D. Study Plan

Version 2.1

2012-2013

Curriculum Development Committee
College of Clinical Pharmacy
King Faisal University, AL-Ahsa-31982
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Pharm. D. Study Plan-Ver 1.0 (2004-2005)
College was founded according to Royal Order 167/8 on 29 / 3 / 1423 H; June 10, 2002,
Curriculum Committee was constituted in 2002
First Study Plan presented at KFU Forum in 3/1425 (May 2004)
Presented at Stakeholders meeting in Riyadh on 28-2-1426 H (7-4-2005).
Approved by KFU council on 6/5/1426 (June 13, 2005)

Pharm. D. Study Plan-Ver 2.0 (2009-2011)
Student**s**, Faculty, Stakeholders, External Reviewers feedback: 2007-2008
Planning for Revision of Study Plan Dec 2008
Process initiated and continued through 2009
Revised Study Plan presented at faculty forum: Feb 2010
Review by external consultants: April-May 2010
Presented at Stakeholders Meeting: June 2010
Approved by the KFU council June 2011

Pharm. D. Study Plan-Ver 2.1 (2012) Append. 8.11
Feedback of students, Faculty, Academic Departments 2011
Consultants review report April 2012
Amendments made in May 2012
Approved by COCP and University Council May 2012

List of Contents

1. The College

1.1. Vision:

To be recognized nationally and internationally for preparing role models in pharmacy practice, education and research with strong social commitment.

1.2. Mission:

To excel in pharmacy education, patient centered care, community engagement and research

Explanatory note:

College of Clinical Pharmacy at King Faisal University is committed to improve health of the community through excellence in education, research and community services.
The college:

1. Prepares Pharm.D. graduates who will be providing **patient care** as effective team members in health care system as lifelong experts in therapeutic planning, intervention and rational use of medicines. This is achieved through a structured academic program, excellence in teaching, clinical training, and planned development activities.
2. Conducts innovative research in basic and applied pharmaceutical sciences in the field of drug discovery, development and application.
3. Brings together dedicated faculty and competent students in a supportive and excellent teaching, learning, and research atmosphere that enhance continuous intellectual and personal development.
4. Serves the community by sharing our expertise with the public and health care professionals by facilitating opportunities for continuing professional development.

1.3. Value statement:

Based on Islamic Principles, the College of Clinical Pharmacy promotes an environment of mutual respect and collaboration, where we value:

- Excellence : Pursue exceptional quality and performance in all that we do
- Responsiveness to community
- Lifelong, self directed learning
- Creativity
- Integrity:

at all levels of teaching, training, research and patient care.

1.4. College Goals:

1. Prepare Pharm D graduates through excellence in Pharmacy education and training
2. Recruit, develop and retain internationally recognized, competent faculty members in all the desciplines
3. Continue to develop administration that will provide leadership for achieving strategic goals
4. Maintain and enhance the quality assurance management, verified through accreditation by National and International Accriditting agencies in Pharmacy Education
5. Engage the local, national and international communities for mutual benefits through expanding the opportunities for collaboration, continuing professional development and postgraduate education
6. Conduct exceptional research in basic and clinical sciences.

2. The Program: Pharm. D.

2.1.. Program Mission:

To prepare Pharm D graduates who will provide patient centered care to meet the health care needs of the community

2.2. Program Goals:

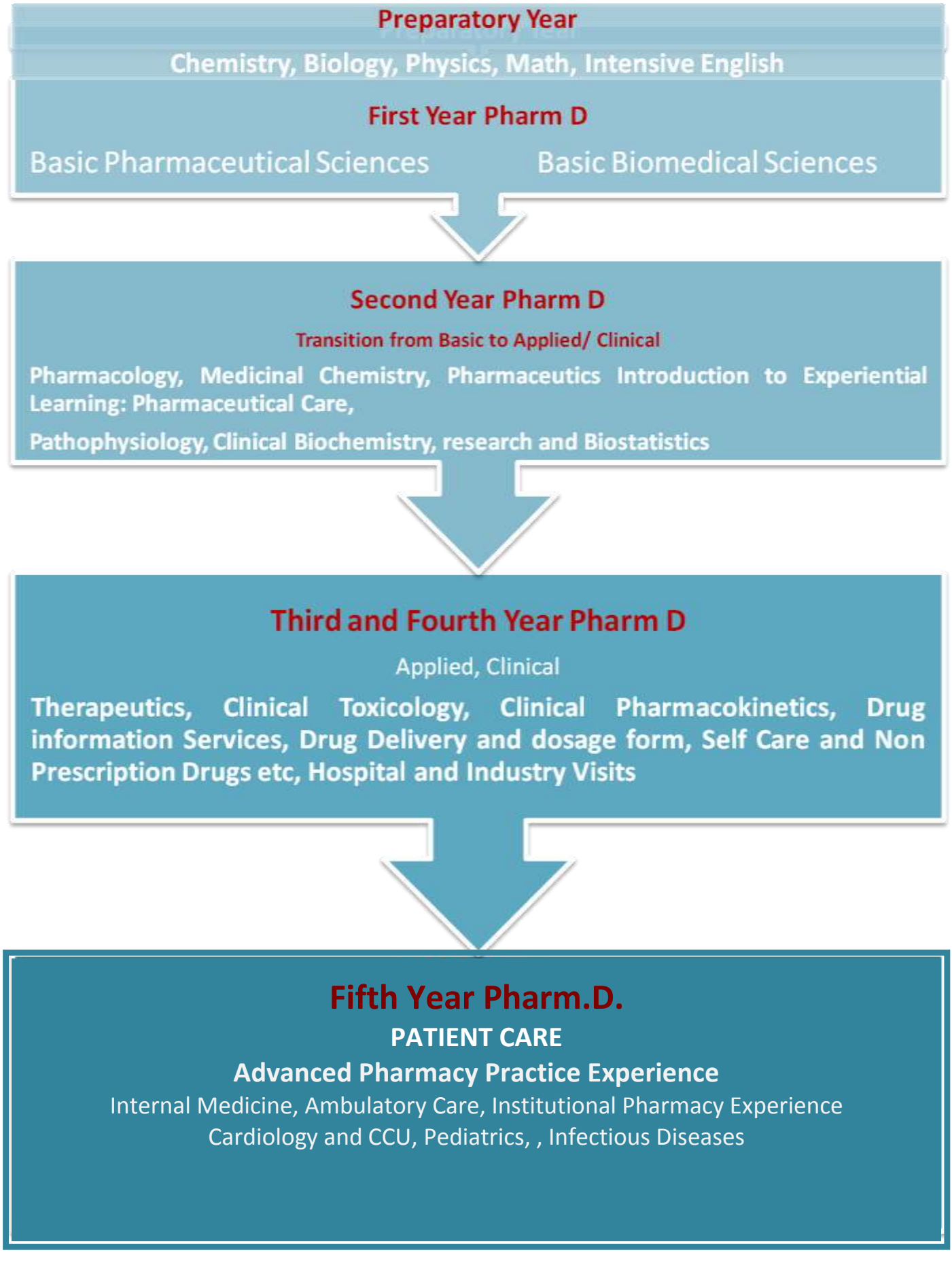
1. Prepare active learners and future experts in Clinical Pharmacy with required knowledge, skills and abilities
2. Educate in management of Pharmacy services and practice
3. Provide foundation for basic and clinical research in the area of drug development and usage

2.3. Terminal Program Objectives:

The Doctor of Pharmacy curriculum prepares graduates to be able to;

1. Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.
2. Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.
3. Develop patient data base from patient interview, review hospital record and communicate with other health professionals in interprofessional environment.
4. Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.
5. Evaluate drug information retrieved from pharmaceutical and biomedical science resources and report for application to specific patient care situation.
6. Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.
7. Use basic principles of organizational and management skills in pharmaceutical services and practice
8. Apply basic principles to design and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences

Curriculum Overview



3. Curriculum Development Committees

Curriculum Development Committee 2009-2010

Patron,
Dr. Mohamed Bin Saad Al-Wesali
Dean, College of Clinical Pharmacy

Chair,
Dr. Afzal Haq Asif
Members:
Dr. Ashraf A. Khalil
Dr. Sherif W. Mansour
Dr. Tanveer Ahmad Khan

Curriculum Development Committee 2010-2011

Chair
Dr. Ibrahim Bin Abdulrahman. Alhaider
Dean, College of Clinical Pharmacy

Members:
Dr. Ashraf A. Khalil
Dr. Sherif W. Mansour
Dr. Tanveer Ahmad Khan
Dr. Tahir Mehmood Khan

Curriculum Development Committee 2011-2012

Patron,
Dr. Ibrahim Bin Abdulrahman. Alhaider
Dean, College of Clinical Pharmacy

Chair,
Dr. Afzal Haq Asif
Members:
Dr. Sherif Wagih Mansour
Dr. Mueen Ahmed KK (Coordinator)
Dr Yasir Ibrahim
Dr. Promise Emika
Dr. Taghreed S. Mahdi
Dr. Dalia Almaghrabi

Curriculum Development Committee
2012-2013

Patron,
Dr. Ibrahim Bin Abdulrahman. Alhaider
Dean, College of Clinical Pharmacy

Head,
Dr. Afzal Haq Asif
Members:
Dr. Sherif Wagih Mansour
Dr. Mueen Ahmed KK (Coordinator)
Dr Yasir Ibrahim
Dr. Promise Emika
Dr Ali Shamri
Mr. Suleman Almahesh
Ms. Sara Alhussain

Steps of the Study plan revision (2009-2010)

1. Constitution of the curriculum committee:
The curriculum committee is a permanent committee. It was reconstituted to have representatives from each department and the Quality Assurance Office to prepare the new study plan.

2. Establishing the Quality Assurance Office:
A room was assigned to the QA office and was furnished and provided with all the required facilities. The main job of the QA office is to monitor the application of all standards of quality in teaching process through reviewing the course files. In addition to this, the QA office prepares the required questionnaires, conducts surveys and provides the curriculum committee with the results of the data analyses.

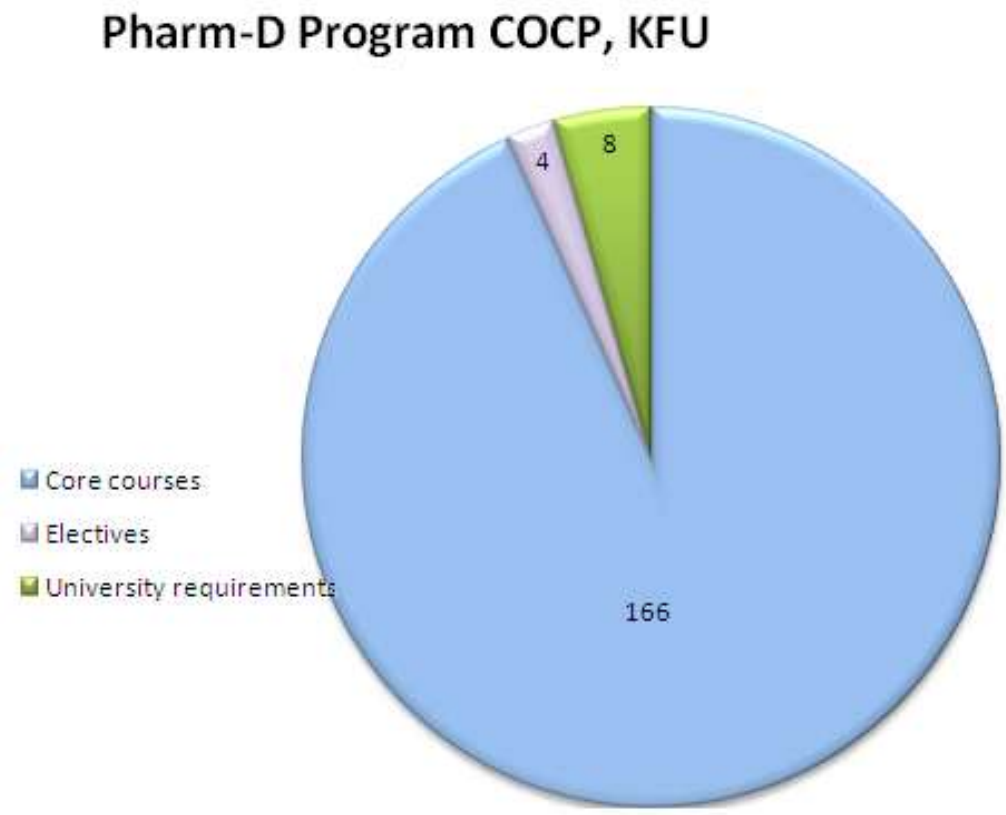
3. Constitution of other supportive committees. Such as:
- Library Committee: to secure the required textbooks for students.
- Laboratory committee: to secure the equipment and other lab facilities.

4. Steps of revision:

a) The college sent a letter to the Vice-President for academic affairs, The Head of the Permanent Curriculum Committee requesting joining the preparatory year (letter no. 158/ 65/ A, dated 2/4/1430 H).
b) The College received a letter from the Vice-President to confirm the joining of the preparatory year with consequent modification of the study plan (letter no. 401/1, dated 2/5/1430 H).
c) The curriculum committee referred to the standards of the Accreditation Council for Pharmacy Education (ACPE), the curricula of the top five universities in USA and the curricula of some of the Saudi Universities taking in consideration the NCAAA standards.
d) The curriculum committee also reviewed the suggestions and remarks of the faculty members, students and external reviewers (from USA and Australia).
e) The main outline of the new study plan was prepared that includes the total number of hours, the number of courses and their distribution over the departments.
f) The new study plan outline was reviewed by the departments and modified based on their suggestions.
g) The courses were modified by the departments based on the new standards in accordance with the NCAAA format.
h) The modified courses were collected by the committee and arranged based on the prepared outline.
i) The course contents were reviewed to avoid overlapping or redundancy among courses.
j) The sequence of the courses was reviewed.

k) The proposed study plan was returned to the departments for final revision.
l) A new numbering system for the courses was introduced to avoid the overlapping with the old curriculum.
m) The standards of skills and knowledge evaluations were added in each course.
n) The proposed study plan was presented in a workshop in presence of the Dean, all faculty members and students, and the feedback was collected and considered in the final modification.
o) A stakeholders' meeting was held under the auspices of the President of the University. Invitations were sent to the Deans of the Colleges of Pharmacy in the Kingdom, the Directors of all tertiary care hospitals in the region, the President of the Saudi Pharmaceutical Society, The Directors of the Clinical Pharmacy Services in SAMSO,ARAMCO, and other professionals.
p) The statistical analysis of the meeting-feedback was generally very good regarding the study plan. (Appendix. 8.10, page 183) The comments received from the stakeholder were considered in further modification of the study plan.
q) The final form of the study plan was sent to external reviewers for final revision. These reviewers include:
    a. The President of the Accreditation Council for Pharmacy Education (ACPE), USA
    b. The Dean of College of Pharmacy, King Saud University.
    c. The President of Saudi Pharmaceutical Society.
    d. The Director of Pharmacy Services and Chief Clinical Pharmacist, SAMSO, ARAMCO, Dhahran.
    e. The Director of Pharmacy Services, Saad Specialist Hospital, Al-Khobre.
    f. The Dean, School of Pharmacy, Universiti Sains Malaysia..
r) The feedback received from the reviewers was considered and the final form of the study plan was prepared.
s) Bench marking of the final study plan was done with that of College of Pharmacy, King Saud University Riyadh, (Appendix. 8.6.1) and with those of 2 of the top 10 US Schools of Pharmacy, School of Pharmacy University of California San Francisco and School of Pharmacy, Purdue University (Appendix 8.6.2)
t) The final study plan was discussed and approved by the College Council.

4. Program Outline



Pharm.D. Program Outline

1- University requirements: 8 Credit hours.

2- College requirements: 170 Credit hours.

Total: 178 Credit hours

A- **University Requirements:**

Islamic Courses	Credit Hours
Islamic Faith	2
Contemporary cultural issues	2
Elective university required course (1)	2
Elective university required course (2)	2
Total	**8**

The elective university required courses include:

1. Islamic Ethics
2. Economic System in Islam
3. Social System in Islam
4. Political System and Human Rights in Islam
5. Scientific and Technical Issues in Islam
6. Feqh Al Syra (Jurisprudence of Prophetic Biography)

B- **College Requirements:**

i. **Core courses:**

Department	Credit Hours
1- Pharmaceutical Sciences	**50**
2- Biomedical Sciences	**29**
3-Pharmacy practice	**87**
Total	**166**

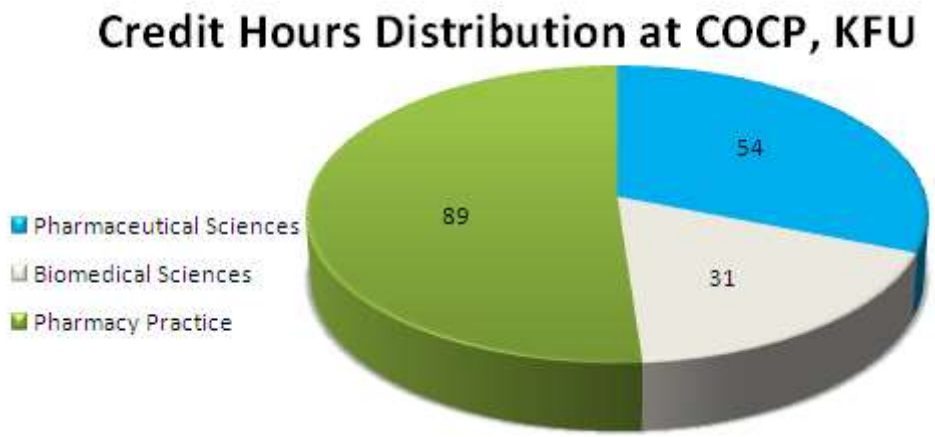
ii. Elective courses:

Course Name	Credit Hours
1- Principles of Drug Design **2- Pharmacogenomics.**	**2**
3- Industrial pharmacy. **4-Pharmaceutical Biotechnology.**	**2**
Total	**4**

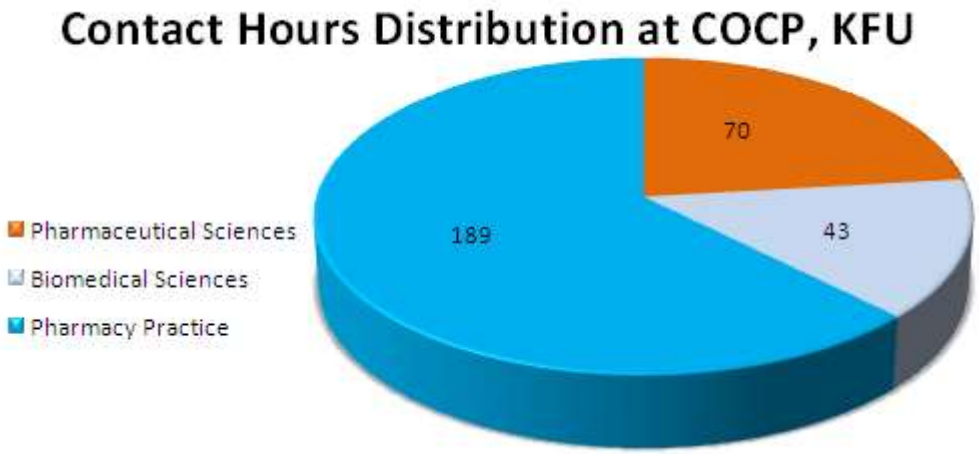
iii. Total COCP Requirement: 170

5. Departmental Distribution of Courses:

Departmental Distribution of Credit Hours



Distribution of Contact Hours



1. Department of Pharmaceutical Sciences

Serial	Course Code	Course No.	Subject	Units	Contact hours
1	PS-1	2010111	Fundamentals of Pharmaceutics	(2 + 1)	**5**
2	PS-2	2010112	Pharmaceutical Organic Chemistry-1	(3+ 1)	**6**
3	PS-3	2010121	Physical Pharmacy	(2 + 1)	**5**
4	PS-4	2010122	Pharmaceutical Analytical Chemistry	(2 + 1)	**5**
5	PS-5	2010123	Pharmaceutical Organic Chemistry-2	(3 + 0)	**3**
6	PS-6	2010124	Pharmacology-1	(2 + 0)	**2**
7	PS-7	2010211	Pharmacology-2	(2 + 1)	**5**
8	PS-8	2010212	Medicinal Chemistry-1	(3 + 0)	**3**
9	PS-9	2010213	Pharmacognosy	(2 +1)	**5**
10	PS-10	2010221	Pharmacology-3	(3 + 0)	**3**
11	PS-11	2010222	Medicinal Chemistry-2	(3 + 0)	**3**
12	PS-12	2010223	Pharmaceutical Dosage Forms.	(2 + 1)	**5**
13	PS-13	2010311	Pharmacology-4	(3 + 0)	**3**
14	PS-14	2010312	Pharmaceutical Delivery System	(2+0)	**2**
15	PS-15	2010313	Medicinal Chemistry-3	(2 + 0)	**2**
16	PS-16	2010314	Bio-pharmaceutics	(2 + 1)	**5**
17	PS-17	2010321	Natural Products & Herbal Medicine	(2 + 0)	**2**
18	PS-18	2010421	Clinical Toxicology	(2 + 0)	**2**
19	PS-19	2010322	Industrial Pharmacy (elective)	(2+0)	**2**
20	PS-20	2010323	Principles of Drug Design (elective)	(2+0)	**2**
			Total credit hours	**54(46+7)**	**70**

2. Department of Biomedical Sciences.

Serial	Course Code	Course No.	Subject	Units	Contact Hours
1	BMS-1	2020111	Physiology-1	(2+1)	**5**
2	BMS-2	2020112	Anatomy and Histology-1	(1+1)	**4**
3	BMS-3	2020113	Biochemistry-1	(2+0)	**2**
4	BMS-4	2020121	Physiology-2	(2+0)	**2**
5	BMS-5	2020122	Anatomy and Histology-2	(1+1)	**4**
6	BMS-6	2020123	Biochemistry-2	(2+1)	**5**
7	BMS-7	2020211	Pathophysiology-1	(2+0)	**2**
8	BMS-8	2020212	Clinical Biochemistry and Nutrition	(2+1)	**5**
9	BMS-9	2020213	Molecular Biology	(2+0)	**2**
10	BMS-10	2020221	Pathophysiology-2	(2+0)	**2**
11	BMS-11	2020222	Immunology	(2+0)	**2**
12	BMS-12	2020223	Microbiology	(3+1)	**6**
13	BMS-13	2020421	Pharmaceutical Biotechnology (elective)	(2+0)	**2**
			Total credit hours	**31 (25+6)**	**43**

3. Department of Pharmacy Practice

Serial	Course Code	Course No.	Subject	Units	Contact Hours
1.	PP-1	2030111	Pharmacy Orientation	(2+0)	**2**
2.	PP-2	2030221	Pharmaceutical Care-1	(0+1)	**3**
3.	PP-3	2030231	IPPE-1	(0+2)	**6**
4.	PP-4	2030311	Therapeutics-1	(4+1)	**7**
5.	PP-5	2030312	Pharmaceutical Care-2	(2+1)	**5**
6.	PP-6	2030321	Therapeutics-2	(4+1)	**7**
7.	PP-7	2030322	Pharmaceutical Care-3	(2+0)	**2**
8.	PP-8	2030323	Institutional Pharmacy Practice	(1+0)	**1**
9.	PP-9	2030324	First Aid and Emergency Medicine	(0+1)	**3**
10.	PP-10	2030325	Research methodology & Biostatistics	(2+1)	**5**
11.	PP-11	2030331	IPPE-2	(0+2)	**6**
12.	PP-12	2030411	Law and Ethics in Pharmacy Practice	(1+0)	**1**
13.	PP-13	2030412	Therapeutics-3	(4+1)	**7**
14.	PP-14	2030413	Drug Information Services	(2+1)	**5**
15.	PP-15	2030414	Clinical Pharmacokinetics	(2+1)	**5**
16.	PP-16	2030415	Parenteral Nutrition	(1+0)	**1**
17.	PP-17	2030416	Pharmacoeconomics	(1+0)	**1**
18.	PP-18	2030421	Therapeutics-4	(4+1)	**7**
19.	PP-19	2030422	Pharmacy management	(2+0)	**2**
20.	PP-20	2030423	Pharm.D. Seminar	(0+1)	**3**
21.	PP-21	2030424	Self Care and Non-prescription Drugs	(2+0)	**2**
22.	PP-22	2030425	Pharmacoepidemiology	(1+0)	**1**
23.	PP-23	2030426	Pharmacogenomics (elective)	(2+0)	**2**
24.	PP-24	2030431	Advanced Pharmacy Practice Experience-1	(0+5)	**15**
25.	PP-25	2030511	Advanced Pharmacy Practice Experience-2	(0+15)	**45**
26.	PP-26	2030521	Advanced Pharmacy Practice Experience-3	(0+15)	**45**
			Total credit hours	**89 (39+50)**	**189**

6. Distribution of Courses

Year and Semester-wise

First Year

First Semester

Course No.	Course Title	Units				Pre
		Lectures	Practical	Cr. Hr	Cont. Hr	
2030111	Pharmacy Orientation	2	0	2	2	--
2010111	Fundamentals of Pharmaceutics	2	1	3	5	--
2010112	Pharmaceutical Organic Chemistry-1	3	1	4	6	--
2020111	Physiology-1	2	1	3	5	--
2020112	Anatomy & Histology-1	1	1	2	4	--
2020113	Biochemistry-1	2	0	2	2	--
7401101	Islamic faith	2	0	2	2	--
		14	**4**	**18**	**26**	

Second Semester

Course No.	Course Title	Units				Pre
		Lectures	Practical	Cr. Hr	Cont. Hr	
2010121	Physical Pharmacy	2	1	3	5	2010111
2010122	Pharmaceutical Analytical Chemistry	2	1	3	5	2010112
2010123	Pharmaceutical Organic Chemistry-2	3	0	3	3	2010112
2020121	Physiology-2	2	0	2	2	2020111
2020122	Anatomy & Histology-2	1	1	2	4	2020112
2020123	Biochemistry-2	2	1	3	5	2020113
2010124	Pharmacology-1	2	0	2	2	2020111
	Total	**14**	**4**	**18**	**26**	

Second Year

Third Semester

Course No.	Course Title	Units				Pre
		Lectures	Practical	Cr. Hr	Cont. Hr	
2010211	Pharmacology-2	2	1	3	5	2010124
2010212	Medicinal Chemistry-1	3	0	3	3	2010123
2020211	Pathophysiology-1	2	0	2	2	2020111
2010213	Pharmacognosy	2	1	3	5	--
2020212	Clinical Biochemistry & Nutrition	2	1	3	5	2020123
2020213	Molecular Biology	2	0	2	2	--
740130	Contemporary Cultural issues	2	0	2	2	--
	Total	**15**	**3**	**18**	**23**	

Fourth Semester

Course No.	Course Title	Units				Pre
		Lectures	Practical	Cr. Hr	Cont. Hr	
2010221	Pharmacology-3	3	0	3	3	2020121
2010222	Medicinal Chemistry-2	3	0	3	3	2010212
2010223	Pharmaceutical Dosage Forms	2	1	3	5	2010111
2020221	Pathophysiology-2	2	0	2	2	2020121
2020222	Immunology	2	0	2	2	2020121
2020223	Microbiology	3	1	4	6	2020211
2030221	Pharmaceutical Care-1	0	1	1	3	--
	Total	**15**	**3**	**18**	**24**	

Summer Semester

2030231	**IPPE-1**(Introductory Pharmacy Practice Experience in Community Pharmacy) For 4 weeks, 160 hours	**0**	**2**	**2**	6	-----

Third Year

Fifth Semester

Course No.	Course Title	Units				Pre
		Lectures	Practical	Cr. Hr	Cont. Hr	
2010311	Pharmacology-4	3	0	3	3	2020121
2010312	Pharmaceutical Delivery System	2	0	2	2	2010223
2010313	Medicinal Chemistry-3	2	0	2	2	2010222
2010314	Bio-pharmaceutics	2	1	3	5	--
2030311	Therapeutics-1	4	1	5	7	2010211
2030312	Pharmaceutical Care-2	2	1	3	5	2030221
	Total	**15**	**3**	**18**	**24**	

Sixth Semester

Course No.	Course Title	Units				Pre
		Lectures	**Practical**	**Cr. Hr**	**Cont. Hr**	
2030321	Therapeutics-2	4	1	5	7	2010221
2030322	Pharmaceutical Care-3	2	0	2	2	2030312
2030323	Institutional Pharmacy Practice	1	0	1	1	--
2030324	First Aid and Emergency Medicine	0	1	1	3	2020121
2010325	Research Methodology & Biostatistics	2	1	3	5	-----
2010321	Natural Products & Herbal Medicine	2	0	2	2	2010213
	Elective University Required Course	2	0	2	2	
2010322/2010323	*Electives* Industrial Pharmacy/Principles of Drug Design	2	0	2	2	2010223/2010313
	Total	**14**	**3**	**18**	**24**	

Summer Semester

2030331	**IPPE-2**Introductory Pharmacy Practice Experience in Institutional Pharmacy, for 4 weeks, 160 hours.	0	2	2	6	**2030231**

Fourth Year

Seventh Semester

Course No.	Course Title	Units				Pre
		Lectures	Practical	Cr. Hr	Cont. Hr	
2030411	Law & Ethics in Pharmacy Practice	1	0	1	1	2030111
2030412	Therapeutics-3	4	1	5	7	2010221
2030413	Drug Information Services	**2**	**1**	**3**	5	2030311
2030414	Clinical Pharmacokinetics	2	1	3	5	2010314
2030415	Parenteral Nutrition	1	0	1	1	2020212
2030416	Pharmaco-economics	1	0	1	1	--
	Elective Islamic Course	2	0	2	2	--
	Total	**13**	**3**	**16**	**22**	

Eighth Semester

Course No.	Course Title	Units				Pre
		Lectures	Practical	Cr. Hr	Cont. Hr	
2010421	Clinical Toxicology	2	0	2	2	2010124
2030421	Therapeutics-4	4	**1**	5	**7**	2010311
2030422	Pharmacy management	2	0	2	2	2030323
2030423	Pharm.D. Seminar	0	1	1	3	2030325
2030424	Self care & Non prescription Drugs	2	0	2	2	2010312
2030425	Pharmaco-epidemiology	1	0	0	1	2030414
2020421/2030426	*Elective* Pharmaceutical Biotechnology /Pharmacogenomics:	2	0	2	2	2020213/2020213
		13	**2**	**15**	**19**	

Summer semester

Course No.	Course Title	Units				Pre
		Lectures	Practical	Cr. Hr	Cont. Hr	
2030431	Advanced Pharmacy Practice Experience-1 (APPE1)	0	5	5	40	
	Total	**0**	**5**	**5**	**40**	

Fifth Year

Ninth semester

Course No.	Course Title	Units				Pre
		Lectures	Practical	Cr. Hr	Cont. Hr	
2030511	Advanced Pharmacy Practice Experience-2 (APPE2)	0	15	15	120	
	Total	**0**	**15**	**15**	**120**	

Tenth semester

Course No.	Course Title	Units				Pre
		Lectures	Practical	Cr. Hr	Cont. Hr	
2030521	Advanced Pharmacy Practice Experience-3 (APPE 3)	0	15	15	120	
	Total	**0**	**15**	**15**	**120**	

7. Description of Courses

7. Courses Description

7.1. First Year

7.1.1. 1st Semester

Course Name	Pharmacy Orientation			توعية صيدلانية			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 2/week	Lec.	Lab.	Tot.
	PP-1	2030111	2+0		2	-	2
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 1st year			Prerequisite	None		

Course Description:

This course will cover the definition of pharmacy and different areas of pharmacy profession and history of pharmacy, introduction to ancient drugs, ancient Egyptian, Greek and Roman medicine, Chinese and Indian medicine, Arab medicine in Spain and modern European medicine, history and global progress in pharmaceutical education, type of different dosage forms, methods for the preparation of drugs, introduction to pharmacopoeias, formularies, regulatory control, and drug management, medical and pharmacy terminology related to body systems needed for complete understanding of other courses, objectives, scope and requirements of Pharm.D. program, introduction to various terms like pharmaceutical care, medication therapy management, role of clinical pharmacist in community and health care setting, introduction to clinical pharmacy and role of clinical pharmacist in direct patient care as effective member of inter-professional team of health care providers, , introduction to various courses, compulsory and electives included in Pharm.D. program, mode of teaching, learning and training in Pharm.D. program, like concepts of inter-professional education and service learning in clinical pharmacy problem based learning, objective structured clinical exam (OSCE), institutional pharmacy training and experiential learning, college disciplinary rules and regulation for the examination.

Course Outcomes: Upon successful completion of this course the student will be able to:

A. Describe the history of pharmacy, pharmacy profession and pharmacy education.

B. Describe objectives, scope and requirement of Pharm.D. Program and role of pharmacist as member of Inter-professional health care system

C. Derive the meaning of medical words through analysis of prefixes, roots and suffixes.

Teaching Strategies:

1. Lectures.
2. Assignments:
3. Active learning**:** Discussions, , Library visits,

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	30 %	0 %	10 %	50%

Textbooks:

1- Pharmacy: An Introduction to the Profession, L. Michael Posey, Publisher; American Pharmacists Association, Ed. 2nd 2008.

2- Medical terminology for Health professions, Ann Ehrich and Carol L. Schroeder, Publisher; Cengage Learning, Ed. 5th 2004.

eference Book:

1. Pharmacy, What It is and How It Works, Kelly. Publisher; CRC Press; Ed. 2nd 2006.
2. Opportunties in Pharmacy Careers, Fred Gable, Publisher; McGraw-Hill, Ed. 1st 2003.
3. Making Medicines, Brief History Of Pharmacy And Pharmaceuticals, Stuart Anderson, Publisher; Pharmaceutical Press, Ed. 1st 2005.
4. Medical Terminology: A Short Course, Davi-Ellen Chabner BA MAT, Publisher: Saunders; Ed. 5th 2008.
5. Medical Terminology: A Living Language, Bonnie Fremgen, Suzanne S. Frucht, Publisher; Prentice Hall, Ed. 4th 2008.

Pharmacy Orientation

Course outcomes and Assessment:

Course outcomes	Method of Assessment
A	W
B	W
C	W

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X	X			
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.			X		
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Fundamentals of Pharmaceutics			أساسيات الصيدلانيات			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 5	Lec.	Lab.	Tot.
	PS-1	2010111	2+1		2	3	5
Track	■ Pharmaceutical Sciences ☐ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 1st year			Prerequisite	None		

Course Description:

Lectures: This course describes parts of prescription, abbreviation, model prescription, controlled substances, labeling techniques, weighing and measuring for compounding extemporaneous preparation and related incompatibilities. It gives and introduction to various pharmaceutical dosage forms and basic guidelines such as solid, liquid, semisolids, suspensions and emulsions.

Practical: Standards for balances, weights and volumetric devices, calculation, compounding prescription, concentration and dilutions, pharmaceutical Incompatibilities, types of labels. Lab sessions will focus on solving actual, practical problems, thus building critical thinking and problem solving skills among the students

Course Outcomes:

After completion of the course, students will be able to:

- **A.** Describe and perform calculation and compounding of extemporaneous preparation.
- **B.** Define, analyze, and overcome any pharmaceutical incompatibilities.
- **C.** Explain parts of prescription and labeling requirements of the various products and controlled substances.

Teaching Strategies:

1. Discussion
2. Lectures
3. Home assignments
4. Experiential learning (Practical part).

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	25 %	25 %	0%	40%

Textbooks:

1. Pharmaceutical Calculations edition. Howard C. Ansel, , Publisher; Lippincott williams & wilkins, Ed 13th 2009.
2. A practical guide to contemporary pharmacy practice, Judith E. T, Lawrence W. Davidow Publisher; Lippincott Williams & Wilkins. Ed. 3rd 2009**.**

Reference Book:

1. Pharmaceutics: the Science of Dosage Form Design, Michael E. Aulton, Publisher; Churchill Livingstone, Ed. 2nd 2002**.**
2. Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems**,** Ansel H.C. Allen L.V. Popovich N, Publisher; Williams and Wilkins, Ed 9th 2010.

Fundamentals of Pharmaceutics

Course outcomes and Assessment:

Course outcomes	Method of Assessment
A	W.P/PB
B	W.PB
C	W.PB

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book)

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr.No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X	X	X		
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.	X				
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Pharmaceutical Organic Chemistry-I			كيمياء عضوية صيدلية-1			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 6/week	Lec.	Lab	Tot.
	PS-2	2010112	3+1		3	3	6
Track	■ Pharmaceutical Sciences ☐ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 1st year			Prerequisite	None		

Course Description:

Lectures: General introduction, nomenclature, bonding, structural isomerism, nomenclature and alkanes, stereochemistry and its biological applications, alkyl halides, free-radical reactions, alcohols, ethers, epoxides, sulfides and their pharmaceutical applications.

Practical: Practical sessions will consist of case based discussions, focusing on development of critical thinking and problem solving skills among students. Spectrometric Identification of different organic compounds (nuclear magnetic resonance, mass spectrometry and its applications in drug metabolism and infra red spectrophotometry) will be covered.

Course Outcomes:

After completion of this course the student will be able to:

A. Define and identify chemical structures, chemical reactions of organic compounds, free radicals and their biological hazards.
B. Define the various type of bonding and its biological applications.
C. Establish relationships between the chemistry of organic compounds and their pharmaceutical applications.
D. Utilize different spectrometric methods to elucidate the structure of organic compounds by interpretation of various spectra (Practical part)

Teaching strategies:

1. Lectures.
2. Active learning.
3. Problem solving.
4. Home assignments.
5. Spectral interpretations and data analysis (Practical part).

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	25 %	25 %	0 %	40 %

Textbooks:

1. Organic Chemistry, Fessenden and Fessenden, Publisher; Brooks Cole, Ed. 6th, 1998.
2. Spectrometric Identification of Organic Compounds, Robert M. Silverstein, Publisher; Wiley; Ed. 8th 2011.

Reference Book:

1. Organic Chemistry, Solomons and Fryhle, Publisher; John Wiley & Sons, Inc. Ed. 9th 2007.

Pharmaceutical Organic Chemistry-I

Course outcomes and Assessment:

Course outcome	Method of Assessment
A	W
B	W
C	W, A/P
D	W.A/P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintaining Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X	X	X	X	
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences	X	X	X	X	

Course Name	Physiology-1			علم وظائف الأعضاء-1			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 5/ week	Lec.	Lab.	Tot.
	BMS-1	2020111	2 + 1		2	3	5
Track	☐ Pharmaceutical Sciences ■ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 1st year.			Prerequisite	None		

Course Description:

Lectures: Physiology of the cell, muscle and nerve (Resting membrane and action pot.-structure of sk. M.F, Simple M Twitch, tetanus & clonus, blood (Erythropoiesis, anemia, W.B.Cs, Coagulation, Blood grouping, immunity), autonomic and central nervous systems (receptors, sensations, vision and hearing, equilibrium), cardiovascular system (properties, heart rate, blood pressure, ECG, cardiac output, hemorrhage & Shock) and respiration (mechanics of breathing, surfactant, lung volume & capacities, regulation of breathing, O_2 –CO_2 transport by blood, hypoxia, cyanosis, artificial breathing).

Practical: Practical lab sessions will be limited to hematological indices, determination of blood coagulation time, blood grouping and rhesus factor, measurement of blood pressure (service learning) and ECG tracing identification. Appropriate time will be assigned to case studies on anemia, including sickle cell diseases, hemophilia and blood group matching.

Course Outcomes:

Upon successful completion of this course the student will be able to :

A- Discuss functions and mechanisms regarding human cells, muscle and nerve, blood, autonomic and central nervous systems, equilibrium, cardiovascular system and respiration.
B- Correlate the normal function with common physiological disorders.
C- Determine and interpret RBC count, WBC count, Hb content, hematocrite value, coagulation time, blood grouping, and measure blood pressure and identify different ECG tracing waves
D- Interpret the given report regarding lab test performed during the course
E- Measure blood pressure of normal subjects as part of community engagement (under supervision)

Teaching Strategies:

1. Lectures.
2. Discussions.
3. Data interpretation.
4. Home assignments.
5. Service learning: visits to community, Schools.

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	25 %	25%	0%	40%

Textbooks:

1. Textbook of Medical Physiology, John E. Hall, Publisher; Elsevier Health Sciences Division, Ed. 12th 2010.
2. Review of Medical Physiology, William F. Ganong, Publisher; McGraw-Hill, Ed. 23rd 2010.

Reference Books:

1. Textbook of Medical Physiology, Walter Boron **,** Emile L. Boulpaep, Publisher; Saunders, Ed. 3rd 2004.
2. Laboratory Atlas of Anatomy and Physiology, Eder D.J., Publisher; Mosby-Inc, Ed. 4th 2007.

Physiology-1

Course outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W. A/P
C	PB
D	PB. A
E	PB

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X	X			
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.	X	X	X		
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.			X	X	X
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Anatomy and Histology-1			علم التشريح والأنسجة-1			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 4/ week	Lec.	Lab.	Tot.
	BMS-2	2020112	1 + 1		1	3	4
Track	☐ Pharmaceutical Sciences ■ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 1st year.			Prerequisite	None		

Course Description:

Lectures: General features of bones; gross anatomy of organs, muscles, vessels and nerves; anatomy of limbs; development of human embryo and teratogenicity. microscopic anatomy of the cell and tissues; histology of cardiovascular system.

Practical: Lab sessions will consist of clinical case discussions followed by identification of relevant macro and micro-structures for applicable concepts for future clinical practice.

Course Outcomes:

Upon successful completion of the course the student should be able to:

A. Describe the structures of the human skeleton, organs, muscles, vessels and nerves with clinical correlation
B. Identify histology of cells, tissues and organs.
C. Describe basic human embryology with effect of drugs on various phases of intrauterine development

Teaching Strategies:

1. Lectures
2. Discussions
3. Home assignments.
4. Case discussions, during Practical sessions

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	25 %	25%	0%	40%

Textbooks:

1. Clinical Anatomy by regions, Richard S, Snell. Publisher; Lippincott Williams & Wilkins. Ed 8th 2007.
2. Junqueira's Basic Histology,Text and Atlas, Luiz Junqueira and Jose Carneiro. Publisher; McGraw-Hill Medical. Ed.12th 2009.
3. Langmans Medical Embryology, Thomas W. Sadler. Publisher; Lippincott Williams & Wilkins. Ed..11th 2009.

Reference Books

1. Gray's Anatomy for Students**,** Richard L. Drake, A. Wayne Vogl, and Adam W. M. Mitchell. Publisher; Churchill Livingstone. Ed 2nd. 2009.
2. Grant's Atlas of Anatomy, Anne M.R. Agur and Arthur F. Dalley. Publisher; Lippincott Williams & Wilkins. Ed.12th 2008.
3. Neuroanatomy: An Illustrated Colour Text, Alan R. Crossman David Neary. Publisher; Churchill Livingstone. Ed. 4th 2010.

Anatomy and Histology-1

Course Outcomes and Methods of Assessment

Course outcome	Method of Assessment
A	W.PB
B	W.PB
C	W

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.					
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.	X	X	X		
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Biochemistry-1			كيمياء حيوية-1			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 2/week	Lec.	Lab.	Tot.
	BMS-3	2020113	2		2	0	2
Track	☐ Pharmaceutical Sciences ■ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 1st year			Prerequisite	None		

Course Description:

Lectures: It is an introductory course that covers fundamental theoretical concepts of biochemistry and applications of biochemistry in life; the chemistry of biomolecules like carbohydrates, amino acids, proteins, nucleic acids, lipids and steroids; enzymes and enzyme regulation.

Course Outcomes:

Upon successful completion of this course the student will be able to:

A- Describe the fundamental theoretical concepts of biochemistry.

B- Identify applications of biochemistry in the health and disease state

C- Define and describe the chemistry of biomolecules including; carbohydrates, amino acids, proteins, nucleic acids, lipids, steroids and enzymes**.**

Teaching Strategies:

1. Lectures
2. Discussions
3. Home and library assignments**.**

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	30 %	0 %	10 %	50 %

Textbooks:

1. Harper's Biochemistry, Robert K. Murray, Publisher; McGraw-Hill Companies, Ed. 28th 2009.
2. Lippincott's Biochemistry, Richard A Harvey, Denise R Ferrier, Publisher; Lippincott Williams & Wilkins, Ed. 5th 2011.

Reference Book:

1. Biochemistry, Geoffrey Zubay, Publisher; William C Brown Ed. 4th 2000.

Biochemistry-1

Course Outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W
C	W, A/P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X	X	X		
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.	X	X	X		
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Courses' Description

7.1. First Year

7.1.2. 2nd Semester

Course Name	Physical Pharmacy			صيدلة فيزيائية			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 5/week	Lec.	Lab.	Tot.
	PS-3	2010121	2+1		2	3	5
Track	■ Pharmaceutical Sciences ☐ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd Semester, 1st year			Prerequisite	2010111		

Course Description:

Lectures: This course describes fundamentals of physical pharmacy, physical properties of drug molecules, rheology, adsorption, surfactants, solubility, co-solvent, effect on solubility, dissolution, pH and buffering, concept of complexation, , thermodynamics, enthalpy and free energy, reaction kinetics, drug stability.

Practical: Lab hours will be utilized for case discussions to develop critical thinking and problem solving skills . Various topics covered will be: pH, pKa, density, viscosity, surface tension, flow properties of powder and adsorption. Mathematical problems will be used to enhance students skills for various pharmaceutical calculations related to pharmacy practice

Course Outcomes:

Upon successful completion of the course, students will be able to:

A. State the physicochemical properties of drug molecules, pH, and solubility.
B. Explain the theory and applications of surfactants, surface and interfacial phenomena, rheology, adsorption, dissolution, complexation and thermodynamics.
C. Apply information regarding physicochemical properties and stability of drug molecules in designing dosage forms.
D. Apply mathematical skills to pharmaceutical calculation.

Teaching Strategies:

1. Lectures
2. Discussions.
3. Home assignments.
4. Pharmaceutical calculations

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	25 %	25 %	0%	40%

Textbook:

1- Martin's Physical Pharmacy and Pharmaceuticals Sciences, P. J. Sinko, Publisher; Lippincott Williams and Wilkins, Ed. 6th 2010.

Reference Books:

1. Physical pharmacy physical chemical principles in the pharmaceutical sciences, Martin A N, Publisher; Lippincott Williams and Wilkins, Ed. 4th 1993**.**
2. Drug Stability: Principles and Practices 3rd Edition Jens T. Carstensen, Marcel Dekker Inc, 2000.

Physical Pharmacy

Course Outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W. P
C	W.P
D	W.P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X	X	X		
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.	X	X	X	X	
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Pharmaceutical Analytical Chemistry			كيمياء تحليلية صيدلية			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 5/week	Lec.	Lab.	Tot.
	PS-4	2010122	2+1		2	3	5
Track	■ Pharmaceutical Sciences ☐ Biomedical Sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd Semester, 1st year			Prerequisite	2010112		

Course Description:

Introduction and applications of chemical and physical methods of analysis of pharmaceutical substances and fundamental concepts and applications of quantitative analysis utilizing different methods of instrumental analysis. These methods include colorimetry, ultra-violet spectroscopy, fluorometry, flame photometry and atomic absorption spectrophotometry and an introduction to chromatography.

Practical: Six practical sessions, which will include testing water samples of various localities of the region and drug analysis utilizing the above mentioned methods.

Course Outcomes:

Upon successful completion of this course the student will be able to:

A. Describe different chemical and physical methods of analysis.
B. Explain the technique and applications of different instrumental methods of analysis.
C. Perform quantitative analysis of drugs
D. Analyze water samples from various localities of the city

Teaching Strategies:

1. Lectures
2. Discussions
3. Service learning (Proposed)
4. Problem solving
5. Data interpretation.

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10%	25%	25%	0%	40%

Textbooks:

1. Principles of Instrumental Analysis, Douglas A, Skoog F, James Holler, Stanley R. Crouch, Publisher; Brooks Cole, Ed. 6th 2006.
2. Vogel's Textbook of Quantitative Inorganic Analysis: Including Elementary Instrumental Analysis, Vogel, Publisher; Longman Sci & Tech. Ed. 4th 1980.

Reference Books:

1. Chemical Analysis: Modern Instrumentation Methods and Techniques, Francis Rouessac and Annick Rouessac, Publisher; Wiley. Ed. 2nd 2009.
2. Analytical Chemistry: Theory and Practice, R. M. Verma, Publisher; CBS Publishers & Distributors, Ed. 3rd 2007.
3. Principles of Quantitative Chemical Analysis, Robert De Levie, Publisher; McGraw-Hill Companies, Ed. 1st 1996.
4. Quantitative Chromatographic Analysis, Thomas Beesley and Benjamin Buglio, Publisher; CRC Press, Ed. 1st 2001.

Pharmaceutical Analytical Chemistry

Course outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W A
C	PB P
D	PB

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcomes to the Pharm.D. Program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X	X		X	
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.				X	
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.	X	X	X		
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					
9.						

Course Name	Pharmaceutical Organic Chemistry-2			كيمياء عضوية صيدلية-2			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 3/week	Lec.	Lab.	Tot.
	PS-5	2010123	3+0		3	0	3
Track	■ Pharmaceutical Sciences ☐ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd Semester, 1st year			Prerequisite	2010112		

Course Description:

Lectures: Alkenes and alkynes, aromaticity and benzene, substituted benzene, aldehydes and ketones, carboxylic acids and derivatives (amides, anhydrides, esters), amines and heterocyclic compound, the effect of chemical properties on biological activity.

Course Outcomes:

Upon successful completion of this course the student will be able to:

A. Describe and identify the chemistry of different groups of organic compounds, heterocyclic compounds, aromatic compounds.
B. Co-relate the pharmacokinetic properties of the drugs to their chemical structures.

Teaching Strategies:

1. Lectures.
2. Active learning
3. Problem solving.
4. Home and library assignments.

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	30 %	0 %	10 %	50 %

Textbook:

1. Organic Chemistry, Fessenden and Fessenden, Publisher; Brooks Cole, Ed. 6th 1998.

Reference Book:

1. Organic Chemistry, Solomons and Fryhle, Publisher; John Wiley & Sons, Inc, Ed. 9th 2007.

Pharmaceutical Organic Chemistry-2

Course outcomes and Assessment

Course outcome	Method of Assessment
A	W, A/P
B	W, A/P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcomes with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X	X			
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.	X	X			
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Physiology-2			علم وظائف الأعضاء-2			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 2/ week	Lec.	Lab.	Tot.
	BMS-4	2020121	2 + 0		2	0	2
Track	☐ Pharmaceutical Sciences ■ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd Semester, 1st year.			Prerequisite	2020111		

Course Description:

Lectures: Endocrinology: (pituitary, thyroid, parathyroid, reproductive system hormones etc), mechanism of hormonal action, types of hormones, regulation of hormone secretion & hormonal effect,. Digestion: GIT secretions & motility, liver function & gall bladder function, GIT disorders. metabolism: temperature regulation, basal metabolic rate, obesity. renal physiology:, body fluids and acid base balance.

Course Outcomes:

Upon successful completion of this course the student should be able to :

A- Describe the endocrine gland function and control of hormonal secretion with function, renal physiology with body fluid and mechanisms of acid-base balance, digestive system motility and secretions and liver functions ,metabolism**.**

B- Correlate the basic physiological function with endocrine, renal, metabolic and GIT disorders.

Teaching Strategies:

1. Lectures .
2. Discussions.
3. Home and library Assignments.
4. Case studies.

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	30 %	0%	10%	50%

Textbooks:

1. Textbook of Medical Physiology, John E. Hall, Publisher; Elsevier Health Sciences Division, Ed. 12th 2010.
2. Review of Medical Physiology, William F. Ganong, Publisher; McGraw-Hill, Ed. 23rd 2010.

Reference Books:

1. Textbook of Medical Physiology, Walter Boron **,** Emile L. Boulpaep**,** Publisher; Saunders, Ed. 3rd 2004.
2. Laboratory Atlas of Anatomy and Physiology, Eder, D.J. Publisher; Mosby Inc, Ed. 4th 2007.

Physiology-2

Course outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W, A/P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the Course Outcomes with the Pharm.D. Program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X	X			
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.	X	X			
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Anatomy and Histology-2			علم التشريح والأنسجة-2			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 4/ week	Lec.	Lab.	Tot.
	BMS-5	2020122	1 + 1		1	3	4
Track	☐ Pharmaceutical Sciences ■ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd Semester, 1st year.			Prerequisite	2020112		

Course Description:

Lectures: General features and anatomy of central and autonomic nervous systems; development of human embryo and teratogenicity. Microscopic anatomy of the lymphoid, digestive, respiratory systems, urinary, endocrine, reproductive and integumentary system.

Practical: Lab sessions will consist of clinical case discussions followed by identification of relevant macro and micro-structures for applicable concepts for future clinical practice

Course Outcomes:

Upon successful completion of the course the student should be able to**:**

A. Describe the structures of human organs, respiratory, digestive, genito-urinary and endocrine system with clinical correlation
B. Identify the histology of tissues and organs.
C. Describe basic human embryology with understanding of normal and abnormal development and possible effects of drugs on its various phases

Teaching Strategies:

1. Lectures
2. Discussion
3. Home assignments.
4. Case discussion during Practical sessions

.

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	25 %	25%	0%	40%

Textbooks:

1. Clinical Anatomy by regions, Richard S, Snell. Publisher; Lippincott Williams & Wilkins. Ed. 8th 2007.
2. Junqueira's Basic Histology,Text and Atlas, Luiz Junqueira, Jose Carneiro. Publisher; McGraw-Hill Medical. Ed. 12th 2009.
3. Langmans Medical Embryology, Thomas W Sadler, Publisher; Lippincott Williams & Wilkins, Ed.11th 2009.

Reference Books:

1. Gray's Anatomy for Students**,** Richard L. Drake, A. Wayne Vogl, Adam W. M. Mitchell. Publisher; Churchill Livingstone, Ed. 2nd 2009.
2. Grant's Atlas of Anatomy, Anne M.R. Agur, Arthur F. Dalley, Publisher; Lippincott Williams & Wilkins. Ed.12th 2008.
3. Neuroanatomy: An Illustrated Color Text, Alan R. Crossman David Neary. Publisher; Churchill Livingstone. Ed. 4th 2010.

Anatomy and Histology-2

Course outcomes and Assessment

Course outcome	Method of Assessment
A	W PB
B	W PB
C	W

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the Course Outcomes with the Pharm.D. Program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.					
2	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.	X	X	X		
3	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Biochemistry-2			كيمياء حيوية-2			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 5/week	Lec.	Lab.	Tot.
	BMS-6	2020123	2+1		2	3	5
Track	☐ Pharmaceutical Sciences ■ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd Semester, 1st year,			Prerequisite	2020113		

Course Description:

Lectures: Metabolic pathways of biomolecules including; carbohydrates, lipids, steroids, prostaglandins, amino acids, proteins, nucleoproteins, nucleic acids, hem proteins, xenobiotics, free radicals and antioxidants in addition to their regulation.

Practical: 50% of practical lab sessions will consist of discussion sessions, where students will discuss, interpret and reflect on the given lab report of biochemical tests, included in the course. Practical exam will also consist of 50% lab practical and 50% case scenarios with lab reports to be interpreted

Topics for practical sessions: Biochemical units of measurements, with special reference to molar units. Qualitative and quantitative assessment of carbohydrates, lipids, proteins and enzymes. Urine analysis, renal stone analysis, assessment of renal functions in form of estimation of blood levels of total proteins and non protein nitrogenous compounds including; Creatinine and urea will be estimated.

Course Outcomes:

Upon successful completion of the course the student will be able to:

A- Describe the metabolic pathways of carbohydrates, amino acids, proteins, nucleoproteins, nucleic acids, lipids, steroids, hemoproteins of xenobiotics, free radicals and antioxidants and their regulations.
B- Define the biochemical units of measurements, with special reference to molar units
C- Demonstrate different methods of urine analysis, renal stone analysis and comprehend the qualitative and quantitative principles for analysis of carbohydrates, lipids, proteins and enzymes.
D- Analyze and interpret renal function tests in normal and diseased states.

Teaching Strategies:

1. Lectures
2. Discussion.
3. Problem solving, Data interpretation
4. Case Study with Clinical Applications
5. Home assignments.

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	25 %	25 %	0 %	40 %

Textbooks:

1. Harper's Biochemistry, Robert K. Murray, Publisher; The McGraw-Hill Companies, Ed. 28th 2009.
2. Lumbrt Stryer's Biochemistry, Jeremy Mark Berg, Lubert Stryer, Publisher; W. H. Freeman, Ed. 6th 2006.

Reference Books:

1. Textbook of biochemistry: with clinical correlations, Thomas Devlin, Publisher; Wiley-Liss, Ed. 6th 2006.
2. Lippincott's Biochemistry, Pamela C. Champe, Publisher; Lippincott Williams & Wilkins, Ed. 5th 2011.
3. Biochemistry, Geoffrey Zubay, Publisher; William C Brown Pub. Ed. 4th 2000.
4. Principles of Biochemistry, David L. Nelson, Publisher; W. H. Freeman. Ed. 4th 2004.

Biochemistry-2

Course Outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W
C	W.PB. P
D	PB.A/P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the Course Outcomes with the Pharm.D. Program Outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.					
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.	X	X	X	X	
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.			X	X	
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Pharmacology-1			علم الأدوية-1			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 2/ week	Lec.	Lab.	Tot.
	PS-6	2010124	2+0		2	0	2
Track	■ Pharmaceutical Sciences ☐ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd Semester, 1st year			Prerequisite	2020111		

Course Description:

Lectures: Introduction to pharmacology, its history and its subdivisions; drugs and their origin, routes of drug administration, general principles in pharmacology: drug absorption, distribution, metabolism: enzyme induction and inhibition, elimination, excretion and clearance of drugs; essentials of drug action, nature of drug receptors and drug receptor interactions with signaling mechanisms, concept of agonist-antagonist and their types, dose response relationships, efficacy, potency and therapeutic index, variation in drug responses., adverse drug reactions;

introduction of autonomic nervous system, synthesis and metabolic pathways of neurotransmitters, cholinergic and adrenergic transmission and autonomic receptors; cholinergic, anticholinergic, adrenergic and antiadrenergic drugs, ganglionic and neuromuscular blockers, autacoids

Course Outcomes:

After completion of the course the student will be able to

A, Define, identify and describe the basics of pharmacology including:

a) General principles of pharmacodynamics

b) General principles of pharmacokinetics

B. Apply the concepts of this course in describing the system based pharmacology courses in a comprehensive manner

C. Apply the general principles of pharmacology to predict or interpret them in the clinical situations.

Teaching Strategies:

1. Lectures.
2. Discussions
3. Problem solving.
4. Case studies
5. Home and library assignments.

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10%	30%	0%	10%	50%

Textbooks:

1. Basic and Clinical Pharmacology Bertram Katzung, Susan Masters, and Anthony Trevor, Publisher; Lange Basic Science, Ed. 11th 2009.
2. Clinical Pharmacology, P. N. Bennett, Morris J. Brown, Publisher; Churchill Livingstone, Ed. 9th 2003.

Reference Books:

1. Goodman and Gilman's The Pharmacological Basis of Therapeutics, Laurence Brunton, Bruce Chabner, Bjorn Knollman, Publisher; McGraw-Hill, Ed. 12th 2010.
2. Rang & Dale's Pharmacology, Humphrey P. Rang, Maureen M. Dale, Publisher; Churchill Livingstone, Ed. 6th 2007.

Pharmacology-1

Course outcomes and Assessment

Course outcome	Method of Assessment
A	**W**
B	**W, A**
C	W, A

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping Of the Course outcomes with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X				
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.		X			
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.		X	X		
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Courses' Description

7.2. Second Year

7.2.1. Semester-1

Course Name	Pharmacology-2			علم الأدوية-2			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 5/week	Lec.	Lab.	Tot.
	PS-7	2010211	2+1		2	3	5
Track	■ Pharmaceutical Sciences ☐ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 2nd year			Prerequisite	2020111		

Course Description:

Lectures: The students shall be provided with knowledge of the principles of cardiovascular, GIT, and respiratory drug actions, establishing an adequate scientific background when using such drugs and to be critical in coping with new drugs in their future practice. They will also be able to apply an essential knowledge base of information about each cardiovascular, GIT, and respiratory prototype drug for a better correlation of current practices in pharmacy and therapeutics. This includes the following important groups of drugs:

Drugs used in treatment of hypertension, angina, heart failure and cardiac arrhythmias, drugs used in urogenital system, diuretics, drugs used in treatment of thromboembolic diseases, bleeding disorders as well as anemia, dyslipidemias, and drugs used in treatment of GIT, and respiratory diseases.

Practical: Simulation lab sessions to strengthen the concepts of mode of drug actions. Case studies involving the drugs included in the course.

Course Outcomes:

Upon successful completion of this course, the student will be able to:

A. Describe the pharmacodynamics and pharmacokinetics of drugs acting on various organ systems including:
   a) Cardiovascular system, renal system, as well as blood and dyslipidemias.
   b) GIT.
   c) Respiratory system.
B. Apply this knowledge in the specific clinical situations in identifying the problem.
C. Analyze the related clinical problem and suggest a solution for it.
D. For simulation lab sessions: Analyze the response of various drugs.
E. For case studies: discuss the etiology, and management of the disease, as well as the most common drug adverse reactions and interactions.

Teaching Strategies:

1. Lectures.
2. Discussions
3. Problem solving.
4. Case studies
5. Home and library assignments.
6. Experiential learning (Practical part).

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10%	25%	25%	0%	40%

Textbooks:

1. Basic and Clinical Pharmacology, Bertram Katzung, Susan Masters, Anthony Trevor, Publisher; LANGE Basic Science, Ed. 12th 2012.
2. Rang & Dale's Pharmacology, Humphrey P. Rang, Maureen M. Dale, James M. Ritter, Rod J. Flower Publisher; Churchill Livingstone, Ed. 7th 2011

Reference Books:

1. Goodman and Gilman's The Pharmacological Basis of Therapeutics, Laurence Brunton, Bruce Chabner, Bjorn Knollman, Publisher; McGraw-Hill, Ed. 12th 2010.
2. Clinical Pharmacology, P. N. Bennett, Morris J. Brown, Publisher; Churchill Livingstone/Elsevier, Ed.10th 2008.

Pharmacology-2

Course Objectives and Assessment

Course outcome	Method of Assessment
A	W
B	W, A/P
C	W, A/P
D	PB. P
E	PB .P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of The Course outcomes with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X			X	
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.		X			X
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences			X		X

Course Name	Medicinal Chemistry-1			كيمياء دوائية-1			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 3	Lec.	Lab.	Tot.
	PS-8	2010212	3+0		3	0	3
Track	■ Pharmaceutical Sciences ☐ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 2nd year			Prerequisite	2010123		

Course Description:

Lectures: This course provides an introduction to drug actions and the chemistry and pharmacological activity of drugs acting on the autonomic nervous system and cardiovascular system. The following topics will be addressed: introduction to medicinal chemistry, drug action on enzymes, drug action on receptors, drug development, quantitative structure-activity relationship, drugs acting on autonomic nervous system, cardiovascular system (cardiotonics, anti-arrhythmics, vasodilators, antihypertensive, anti hyperlipedemic, drugs affecting blood and diuretics) and drug design for related drugs.

Course outcomes:

After completion of this course, the student will be able to:

A. Define and identify the role of medicinal chemistry in the process of drug discovery and drug development
B. Describe drug-target interactions including drug-receptor and drug-enzyme interaction
C. Discuss the effect of different physicochemical properties on biological activity.
D. Discuss qualitative and quantitative structure-activity relationships.
E. Identify various pharmacokinetic and pharmacodynamic properties of specific drug classes such as drugs acting on the autonomic nervous system, drugs acting on the cardiovascular system and diuretics

Teaching Strategies;

1. Lectures.
2. Discussion.
3. Home and library assignments.

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10%	30%	0%	10%	50%

Textbooks:

1- An Introduction to Medicinal Chemistry, Graham L. Patrick, Publisher; Oxford University Press Inc, New York, Ed. 4th 2009.

2- Principles of Medicinal Chemistry, T. L. Lemke, W.O. Foye, David A Williams, Victoria F Roche, S. William Zito, Wolters Kluwer, Publisher; Lippincott Williams and Wilkins, Ed. 6th 2008.

Reference Books:

1- Medicinal Chemistry: An Introduction T.B., G. Thomas; Publisher; John Wiley & Sons Ltd. Ed. 2nd 2007 .

2- Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry. John H. Block, John M. Beale, Jr. Publisher; Lippincott Williams and Wilkins, Ed. 12th 2010.

Medicinal Chemistry-1

Course outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W
C	W, A/P
D	W, A/P
E	W, A/P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.		X	X	X	X
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.	X	X	X	X	X
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences		X	X		

Course Name	Pathophysiology-1			علم فسيولوجيا الأمراض-1			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 2/ week	Lec.	Lab.	Tot.
	BMS-7	2020211	2 + 0		2	0	2
Track	☐ Pharmaceutical Sciences ■ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 2nd year.			Prerequisite	2020111		

Course Description:

Lectures: Physiological basis of pathology and etiology of diseases. Inflammation and its process, cell cycle. Cellular disturbances: degeneration; regeneration and repair. Basics of neoplasm and metabolic diseases. Diseases of the cardiovascular system, diseases of the respiratory system Dermatological and sexually transmitted diseases. Parasitic and microbial diseases.

Course Outcomes:

After completion of the course, the student will be able to:

A- Describe the physiological bases of pathology of the cell, the pathophysiological basis of inflammation, the basis of neoplasia, metabolic diseases, cardiovascular diseases, respiratory disorders, skin and sexually transmitted diseases.

B- Correlate the disease process with diagnosis for various treatment options.

Teaching Strategies:

1. Lectures.
2. Discussions
3. Problem solving.
4. Case studies
5. Home and library assignments.

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	30 %	0%	10%	50%

Textbooks:

1. Essentials of Pathophysiology for Pharmacy, M.M. Zdanowikz , Publisher; CRC Press Pharmacy education series, Ed. 3rd 2003.
2. Pharmacotherapy A Pathophysiologic Approach, Joseph T. Dipiro, Robert L. Talbert, Michael Posey, Publisher; Appleton and Lange, Ed. 2nd 2006.

Reference Books:

1. Pathophysiology-Concepts of Altered Health States, Carol Mattson Porth, Publisher; Appleton and Lange Ed. 7th 2007.
2. Pathophysiology: Altered Regulatory Mechanisms in Disease, Edward D. Forhlich, Publisher; Lippincott Company, Philadelphia, Ed. 2nd 2005.
3. Harrison's Principles of Internal Medicine, Companion Handbook, Anthony Fauci, Publisher; McGraw-Hill, Ed. 17th 2008
4. Pulmonary Pathophysiology: the Essentials, John B. West**,** Publisher; McGraw-Hill, Ed. 7th 2008.

Pathopysiology-1

Course outcomes and Assessment

Course outcome	Method of Assessment
A	W, A/P
B	W, A/P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X	X			
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.	X	X			
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.	X	X			
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Pharmacognosy						عقاقير
Course Information	Course Code	Course No	Credit Hours	Contact Hours 5/week	Lec.	Lab.	Tot.
	PS-9	2010213	2+1		2	1	3
Track	■ Pharmaceutical Sciences ☐ Biomedical sciences ☐ Pharmacy Practice ☐ Elective courses ☐ University requirement						
Level	1st Semester, 2nd year			Prerequisite	--		

Course Description:

Lectures: An introduction to Pharmacognosy, Drug evaluation and identification of adulterants. Study of selected drugs of natural origin, leaves, flowers, barks, woods, seeds, fruits, herbs, roots and rhizomes. The study of each organ includes definition, collection, constituents, and diagnostic elements, chemical tests for identity, purity and uses.

Practical: Practical hours will be used for group discussions, presentations and case based studies on usage of natural products among local citizens and health profession and its importance in different diseases.

Course Outcomes:

At the end of course, the students will be able to

A. Describe the main drugs obtained from natural sources, their classifications, indications, and side effects etc.
B. Identify and classify natural drugs from the plant kingdom as well as their proper collection, storage and marketing according to official texts.
C. Describe the herbal drugs used in general population and in the health profession

Teaching Strategies:

1. lectures
2. Tutorials, Discussions
3. Problem solving
4. Home and library assignments

Grading Plan	Quizzes	Midterm	Assignments/ presentations/participation	Assignments/projects	Final Exam
	10%	25%	15%	0%	50%

Text Books:

a. Trease & Evans' Pharmacognosy, William Charles Evans, 2002.
b. Botany: An introduction to Plant Biology, Ed. 3rd 2008.

Reference Books

1. Practical Pharmacognosy, Kokate C.K, Pub;isher; Vallabh Publication 1999.
2. Fundamentals of Pharmacognosy & Phytotherapy, Micheal Henrich, Joanne Burnes, Simmon Gibbons, Elizabeth Williamson, Pub;isher; Churchill living stone Ed 1st , 2004.

Pharmacognosy

Course outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W. A/P
C	W. A/P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the Course

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	**X**				
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.			X		
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.		X	X		
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Clinical Biochemistry and Nutrition			الكيمياء الحيوية السريرية والتغذية			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 5/week	Lec.	Lab.	Tot.
	BMS-8	2020212	2+1		2	3	5
Track	☐ Pharmaceutical Sciences ■ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 2nd year			Prerequisite	2020123		

Course Description:

Lectures: The metabolic disorders related to the metabolism of carbohydrates, lipids, steroids, amino acids, proteins, nucleoproteins, nucleic acids and hemoproteins. Also, starvation and obesity will be covered. In addition to the clinical enzymology, vitamins and minerals, electrolyte and trace elements will be taught. Topics also include, biochemical changes occurring in the human body under pathological conditions and the related diagnostic lab parameters. Also, it deals with evaluation of the disease parameters in biological fluids and their interpretations.

Practical: Investigation of biomedical changes associated with the metabolic diseases. Accuracy and precision of analysis. Assessment of liver functions in the form of estimation of serum levels of GPT, GOT, albumin, total and direct bilirubin. Also, Assessment of lipo gram in form of estimation of serum levels of total lipids, triglycerides, cholesterol, HDL and LDL, in addition to the determination of blood levels of glucose, hemoglobin and serum uric acid. Case-based discussions will be included in the practical sessions.

Course Outcomes:

After successful completion of the course the student will be able to:

A- Describe the biochemical changes occurring in the human body under pathological condition.
B- Identify the inter-relationship between nutrition, drugs and disease.
C- Investigate the biomedical changes associated with metabolic diseases.
D- Analyze liver functions and assessment of lipid profile and other blood chemistries.
E- Interpret the laboratory data for diagnosis, therapeutic planning and outcomes of therapy

Teaching Strategies:

1. Interactive Lectures
2. Case Studies: Problem solving, Data interpretation and Clinical Applications
3. Home and library assignments.

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	25 %	25 %	0 %	40 %

Textbooks:

1- Understanding Normal and Clinical Nutrition, Sharon Rady Rolfes, Kathryn Pinna and Ellie Whitney Publisher; Brooks Cole, Ed. 8th 2008.
2- Clinical Nutrition, Michael J. Gibney, Marinos Elia, Olle Ljunggvis and Julie Dowsett, Publisher; Wiley-Blackwell, Ed. 1st 2005

Reference Books:

1- Nutrition and Diagnosis Related Care, Sylvia Escott-Stump, Publisher: Lippincott Williams & Wilkins, **Ed**. 7th 2011.
2- Modern Nutrition in Health and Disease, Maurice E. Shils, Moshe Shike, A. Catharine Ross, Benjamin Caballero and Robert J. Cousins, Publisher: Lippincott Williams & Wilkins, Ed. 10th 2005.
3- Clinical Chemistry, William J. Marshall and Stephen K. Bangert, Publisher: Mosby, Ed. 5th 2004.

Clinical Biochemistry & Nutrition

Course Outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W
C	PB- P
D	PB - A/P
E	A/P - P

Key:

Assignment/Project Written PB: Performance Based A/P: W: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book P:

Mapping of the Course Outcomes with the Pharm.D. Program Outcomes

Sr. No	Program outcomes (Pharm. D.)	Course outcomes				
		A	**B**	**C**	**D**	**E**
1	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.					
2	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.		X	X	X	X
3	Develop patient data base from patient interview, review hospital record and communication with other health professionals.	x	X	X	X	X
4	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.		X	X	X	X
5	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.		X	X	X	X
6	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Molecular Biology			علم الأحياء الجزيئية			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 2/week	Lec	Lab	Tot
	BMS-9	2020213	2+0		2	0	2
Track	☐ Pharmaceutical Sciences ■ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 2nd year			Prerequisite	None		

Course Description:

Lectures: Molecular biology methods are used extensively in modern day drug discovery, research and development, and diagnostics. this course is intended to provide background knowledge of molecular biology to future clinical pharmacists. the course includes; cell structure and functions, mitosis and meiosis, chromosomes to DNA, intracellular communications and mechanisms of signal transduction, nucleotides and nucleic acids, DNA and its organization in the nucleus, information flow in the cell, DNA replication and its inhibitors, DNA repair mechanisms, eukaryotic and prokaryotic replication, gene expression and its control. Transcription and its control, genetic code and mutations, protein synthesis and its inhibitors, recombinant DNA techniques and introduction to bioinformatics.

Course outcomes:

A Discuss the structure and functions of various nucleotides and nucleic acids
B Describe various molecular processes of DNA replication, transcription and translation
C Discuss mutations and their likely outcome and express various DNA repair mechanisms
D Identify inhibitors of DNA replication, transcription and translation and their use in clinical practice .
E Apply the techniques being used in the field of biotechnology

Teaching Strategies:

1. Lectures
2. Discussion.
3. Problem solving, Data interpretation
4. Case Study with Clinical Applications
5. Home and library Assignments

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10%	30%	0 %	10%	50%

Textbooks:

1. Molecular Biology: Genes to Proteins, Burton E. Tropp, David Freifelder, Publisher; Jones & Bartlett Learning, Ed. 3rd 2007.
2. Molecular biology and biotechnology, John M. Walker, Ralph Rapley, Publisher; Royal Society of Chemistry, Ed. 5th 2009.

Reference Books:

1. Lewin's Genes X, Jocelyn E. Krebs, Elliott S. Goldstein, Stephen T. Kilpatrick, Publisher; Jones & Bartlett Publishers, Ed.10th 2009.
2. Molecular Cell Biology, Harvey Lodish, Arnold Berk, Chris A. Kaiser, Publisher; W. H. Freeman; Ed. 6th 2007.
3. Molecular and Cell Biology For Dummies, Rene Fester Kratz , Publisher: For Dummies; Ed. 1st 2009.
4. Fundamental Molecular Biology, Lizabeth A. Allison, Publisher: Wiley-Blackwell; Ed. 1st 2007.
5. Molecular Biology made simple and fun, David P. Clark, Lonnie D. Russell, Publisher: Cache River Press; Ed. 4th 2010.

Molecular Biology

Course Outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W
C	W
D	W
E	A/P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintaining a Practical journal/Pharmaceutical Care History Book

Mapping of the Course Outcomes with Pharm.D. Outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X				
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.		X	X	X	X
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					X
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Courses' Description

7.2. Second Year

7.2.2. 2nd Semester

Course Name	Pharmacology-3			علم الأدوية-3			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 3/week	Lec.	Lab.	Tot.
	PS-12	2010221	3+0		3	0	3
Track	■ Pharmaceutical Sciences ☐ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd Semester, 2nd year			Prerequisite	2020121		

Course Description:

Lectures: The students shall be provided with knowledge of the pharmacokinetic and pharmacodynamic principles governing the drug actions, adverse drug reactions and drug interactions, both in clinical pharmacy practice as well as in basic and clinical research in the area of pharmacology. This includes the following important groups of drugs:

CNS acting drugs (antipsychotic, antidepressants, anxiolytic, sedative and hypnotic agents), drugs used in parkinsonism and other movement disorders, Alzheimer's disease, epilepsy, local and general anesthetics, drugs of abuse and opioid analgesics. Nonsteroidal anti-inflammatory drugs and drugs used in rheumatoid arthritis and gout, hormonal drugs (pituitary hypothalamic, corticosteroids male and female sex steroids, contraceptive and fertility drugs), and drugs acting on bone and mineral homeostasis,

Course Outcomes:

Upon successful completion of this course the student will be able to:

A. Describe the pharmacodynamics and pharmacokinetics of:
   a) Drugs acting on central nervous system
   b) Drugs acting on Endocrine system
   c) Anti-inflammatory and antipyretic drugs
B. Apply this knowledge in the specific clinical situations in identifying the problem.
C. Analyze the related clinical problem and suggest a solution for it

Teaching Strategies:

1. Lectures
2. Discussion.
3. Problem solving,
4. Case Study with Clinical Applications
5. Home and library assignments.

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10%	30%	0%	10%	50%

Textbooks:

1. Basic and Clinical Pharmacology, Bertram Katzung, Susan Masters, Anthony Trevor, Publisher; Lange Basic Science, Ed. 11th 2009.
2. Rang & Dale's Pharmacology, Humphrey P. Rang, Maureen M. Dale, Publisher; Churchill Livingstone, Ed. 6th 2008

Reference Books:

1. Goodman and Gilman's The Pharmacological Basis of Therapeutics, Laurence Brunton, Bruce Chabner, Bjorn Knollman, Publisher; McGraw-Hill, Ed. 12th 2010.
2. . Clinical Pharmacology, P. N. Bennett, Morris J. Brown, Publisher; Churchill Livingstone/Elsevier, Ed.10th 2008

Pharmacology-3

Course Outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W.A/P
C	W.A/P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of The Course outcomes with the Pharm.D. Program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X				
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.	X	X			
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.		X			
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.			X		
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences			X		

Course Name	Medicinal Chemistry-2			كيمياء دوائية-2			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 3/week	Lec.	Lab.	Tot.
	PS-11	2010222	3+0		3	0	3
Track	■ Pharmaceutical Sciences ☐ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	· 2nd Semester, 2nd year			· Prerequisite	2010212		

Course Description:

Lectures: This course enables the student to understand the chemistry and mode of action of hormones and drugs acting on the central nervous system. The following topics will be addressed: chemistry and mode of action of drugs acting on the central nervous system (analgesics, anaesthetics, psychotropic drugs, anti-epileptics and anti-Parkinsonians, non-steroidal anti-inflammatory drugs, antihistaminic drugs, local anesthetic agents, prostaglandins, steroidal and non-steroidal hormones, adrenocorticoids, oral hypoglycemic drugs and anti-thyroid..

Course Outcomes:

After completion of this course, the student will be able to:

A. Describe the functions of different brain structures in relation to actions of centrally acting drugs.
B. Identify various pharmacokinetic and pharmacodynamic properties of specific drug classes such as drugs acting on the central nervous system, hormones and oral anti-diabetic drugs.
C. Correlate chemical structure to biological activity of the mentioned classes of drugs.

Teaching Strategies:

1. Lectures.
2. Discussion.
3. Home and library assignments.

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10%	30%	0%	10%	50%

Textbooks:

1. An Introduction to Medicinal Chemistry, Graham L. Patrick, Publisher; Oxford University Press Inc, New York, Ed. 4th 2009.
2. Principles of Medicinal Chemistry, T. L. Lemke, W.O. Foye, David A Williams, Victoria F Roche, S. William Zito, Wolters Kluwer, Publisher; Lippincott Williams and Wilkins, Ed. 6th 2008.

Reference Books:

1- Medicinal Chemistry: An Introduction T.B, G. Thomas, Publisher; John Wiley & Sons Ltd. Ed. 2nd 2007.

2- Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry. John H. Block, John M. Beale, Jr. Publisher; Lippincott Williams and Wilkins, Ed. 12th 2010.

Medicinal Chemistry-2

Course outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W.A/P
C	W. A/P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X	X	X		
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.		X	X		
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences		X	X		

Course Name	Pharmaceutical Dosage Forms			أشكال الجرعات الصيدلانية			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 5/week	Lec.	Lab.	Tot.
	PS-10	2010223	2+1		2	3	5
Track	■ Pharmaceutical Sciences ☐ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd Semester, 2nd year			Prerequisite	2010111		

Course Description:

Lectures: This course covers the design and formulation of dosage forms, including liquids (elixirs, iodine solution, gargle, mouth wash), semisolid dosage forms (ointments, creams, gels, suppositories) and solid dosage forms (powders, tablets, capsules), emulsions, suspensions, parenteral preparations from raw materials, methods of preparation and quality control tests.

Practical: Seven of the practical sessions will be utilized for case based discussion. Calculations and preparations of different semisolids and solid dosage, liquid and sterile dosage forms and their quality control.

Course Outcomes:

At the end of the course, students will be able to:

A. Describe the physical properties, methods of preparation and application of solid, semisolids, liquid and sterile dosage forms
B. Select the proper dosage form for the given condition
C. Calculate and prepare the selected dosage forms in the laboratory according to official USP and Martindale's Pharmacopoeia testing procedures

Teaching Strategies:

1. Interactive Lectures by aid of Power point presentations.
2. Conducting experiments
3. Assignments (essays and oral presentation)

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	25 %	25 %	0 %	40%

Textbooks:

1. Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems, Ansel H.C. Allen, L.V, Popovich N, Publisher; Williams and Wilkins, Ed. 9th 2010.
2. Pharmaceutics: the Science of Dosage Form Design, Michael E. Aulton, Publisher; Churchill Livingstone, Ed. 2nd 2002.

Reference Books:

1. Pharmaceutical Dosage Forms: Tablets, L. Augsburger, S. W. Hoag, Publisher; Informa Healthcare, Ed. 3rd 2008.
2. Pharmaceutical Dosage Forms and Drug Delivery, Ram I. Mahato, Publisher; CRC Press, Ed.24th 2007

Pharmaceutical Dosage Forms

Course outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W.PB.P
C	W.PB.P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X				
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.	X	X	X		
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences		X	X		

Course Name	Pathophysiology-2			علم فسيولوجيا الأمراض-2			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 2/ week	Lec.	Lab.	Tot.
	BMS-10	2020221	2 + 0		2	0	2
Track	☐ Pharmaceutical Sciences ■ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd Semester, 2nd year			Prerequisite	2020121		

Course Description:

Lectures: Immune disorders (auto immune diseases)- GI disorders (diarrhea- constipation- peptic ulcers- gall bladder stones- jaundice and liver diseases: hepatitis & liver cirrhosis)- renal disorders (urinary tract obstruction- renal stones- urinary tract infections- renal failure-body fluid disorders) –endocrine disorders: pituitary disorders (hyper-prolactinemia- acromegaly & gigantism, dwarfism- Simmonds disease- ADH disorders-thyroid gland disorders (goiter- myxedema)- suprarenal gland disorders (Cushing syndrome & Addison's disease)- hematological disorders : anemia- polycythemia- leukemia- leukocytosis & leucopenia. CNS disorders: sensory & motor neurological disturbances, basal ganglia disorders, headache.

Course Outcomes:

At the end of the course the student will be able to:

A- Describe/comprehend pathophysiological of diseases of immune system, gastro intestinal disorders, renal diseases, hematological disorders and neurological disorders.

B- Correlate the pathophysiological mechanisms with diagnosis and basic concepts for treatment of immune disorders, endocrine and GIT diseases, renal disorders, hematological diseases and neurological disorders.

Teaching Strategies:

1. Lectures.
2. Discussion.
3. Home and Library Assignments.
4. Case studies.

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	30 %	0%	10%	50%

Textbooks:

1. Essentials of Pathophysiology for Pharmacy, M.M. Zdanowikz , Publisher; CRC Press Pharmacy education series, Ed. 3rd 2003.
2. Pharmacotherapy A Pathophysiologic Approach, Joseph T. Dipiro, Robert L. Talbert, Michael Posey, Publisher; Appleton and Lange, Ed. 2nd 2006.

Reference Books :

1. Pathophysiology-Concepts of Altered Health States, Carol Mattson Porth, Publisher; Appleton and Lange Ed. 7th 2007.
2. Pathophysiology: Altered Regulatory Mechanisms in Disease, Edward D. Forhlich, Publisher; Lippincott Company, Philadelphia, Ed. 2nd 2005.
3. Harrison's Principles of Internal Medicine, Companion Handbook, Anthony Fauci, Publisher; McGraw-Hill, Ed. 17th 2008
4. Pulmonary Pathophysiology: the Essentials, John B. West, Publisher; McGraw-Hill, Ed. 7th 2008.

Pathopysiology-2

Course outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W.A/P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintaining a Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X	X			
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.	X	X			
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.	X	X			
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Immunology			علم المناعة			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 2 /week	Lec	Lab	Total
	BMS-11	2020222	2+0		2	0	2
Track	☐ Pharmaceutical Sciences ■ Biomedical Sciences ☐ Pharmacy Practice ☐ Elective Course ☐ University requirement						
Level	2nd Semester, 2nd year		Prerequisite	2020121			

Course Description

Lectures: Immunology is course offered in order to prepare the students for a better understanding of drug pharmacokinetics and disease processes. The course is divided into basic and clinical sections and includes Basic concepts in immunology, adaptive and innate immunity, immunological products and role of immunological products in prophylaxis, therapy and diagnosis. Antigen-antibody reactions, Immuno-regulation, Immunological memory and tolerance, abnormalities of the immune system including autoimmunity, organ transplantation and rejection. Specific topics include anatomy of the Immune System; Organs, tissues, cells and soluble factors of immune system, the immune response, the innate immune system, the adaptive immune system, Humoral immunity, cell mediated immunity, hypersensitivity reactions, autoimmunity, immune deficiency disorders, tumour immunity.

Course Outcomes:

A. Interpret basic principles of immunology as they currently impact human medicine.
B. Describe how the immune system functions in a specific and non-specific way.
C. Employ knowledge of immunology in various disease processes

Teaching Strategies:

1. Lectures
2. Discussion, tutorials
3. Case Studies with clinical applications
4. Home and library assignments.

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	30 %	0%	10%	50%

Textbooks:

1. Immunology, David K. Male, Jonathan Brostoff, Ivan Maurice Roitt, David B. Roth, Publisher; Elsevier Health Sciences, Ed; 7th 2006.
2. Lippincott's Illustrated Reviews: Immunology, Tao Doan, Roger Melvold, Susan Viselli, Carl Waltenbaugh, Ph.D., Richard A. Harvey, Ph.D., Pamela C. Campe, Bruce D. Fisher, Publisher; Lippincott Williams & Wilkins, Ed.9th 2009.
3. Essentials of clinical immunology, Helen Chapel, Mansel Haeney, Siraj Misbah, Publisher; Wiley-Blackwell, Ed.5th 2006.

Reference Books:

1. Immunology, Janis Kuby, Thomas J. Kindt, Barbara Osborne and Richard A. Goldsby. Publisher; W.H. Freeman, Ed. 6th 2007.
2. Basic and Clinical Immunology, Mark Peakman, Diego Vergani. Publisher; Elsevier/Churchill Livingstone, Ed. 2nd 2009.
3. Clinical Immunology Principles and Practice, Robert R. Rich. Publisher; Mosby/Elsevier, Ed. 3rd 2008.
4. Clinical Immunology and Serology: A Laboratory Perspective, Christine Dorresteyn Stevens.Publisher; F.A. Davis. Ed. 3rd 2009.
5. Immunology: understanding the immune system, Klaus D. Elgert. Publisher; John Wiley and Sons, Ed. 9th 2009.

Immunology

Course outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W
C	A/P

W: Written PB: Performance Based A/P: Assignment/Project

P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes*:*

Sr. No:	Program outcomes (Pharm. D)	Course outcomes				
		A	B	C	D	E
1	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.			X		
2	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.	X	X	X		
3	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.			X		
6	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences	X		X		

Course Name	Microbiology			علم الأحياء الدقيقة			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 6 /week	Lec	Lab	Total
	BMS-12	2020223	3 + 1		3	3	6
Track	☐ Pharmaceutical Sciences ☐ Elective Course			■ Biomedical Sciences ☐ University requirement		☐ Pharmacy Practice	
Level	2nd Semester, 2nd year			Prerequisite	2020211		

Course Description

Lectures: This course is offered to prepare the students for understanding of infectious diseases and their rational management. it includes; introduction to microbiology including history and its need in pharmacy, general principals of microbial concepts including terminology, host parasite relationship and normal flora, pathogenicity of microorganisms, principles of infectious disease, bacterial structure and classification, bacterial growth, metabolism and its genetics, important pathogenic bacteria and mechanisms of disease production, fungi, protozoa and helminthes, introduction to virology including viral classification and important human diseases caused by viruses.

Practical: 50% of the time will be allocated to case studies, and 50% for Gram staining, culture and sensitivity tests, MIC for various anti-microbial drugs.

Course Outcomes:

A. Classify various microorganisms and describe pathogenic features of each class .
B. Correlate the pathogenicity of common microorganisms associated with specific clinical conditions
C. Articulate factors involved in pathogenesis of various diseases
D. Identify various microorganisms, their sensitivity to drugs, with MIC and other lab data

Teaching Strategies:

1. Lectures
2. Discussion.
3. Case Study with Clinical Applications
4. Home and library assignments.

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	25 %	25 %	0 %	40%

Textbooks:

1- Lippincott's Illustrated Reviews: Microbiology, Richard A. Harvey, Pamela C. Champe, Bruce D. Fisher, Publisher; Lippincott Williams & Wilkins, Ed. 2nd 2006,
2- Microbiology and Immunology, Ken S. Rosenthal, James S. Tan, Publisher; Mosby Elsevier, Ed. 2nd 2007.

Reference Books:

1- Medical Microbiology, Patrick R. Murray, Ken S. Rosenthal, George S. Kobayashi, Michael A. P, Publisher; Mosby/Elsevier, Ed. 6th 2009.
2- Medical Microbiology & Immunology: Examination & Board Review, Warren Levinson, Ernest Jawetz, Publisher; McGraw-Hill Professional, Ed. 9th 2006.

Microbiology

Course outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W
C	W
D	PB

W: Written PB: Performance Based A/P: Assignment/Project

P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes*:*

Sr. No:	Program outcomes (Pharm. D)	Course outcomes				
		A	**B**	**C**	**D**	**E**
1	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X				
2	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.	X	X	X	X	
3	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.		X			
5	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences			X	X	

Course Name	Pharmaceutical Care-1			رعاية صيدلانية-1			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 3/week	Lec.	Pract	Tot.
	PP-2	2030221	0+1		0	3	3
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd Semester, 2nd year			Prerequisite	None		

Course Description: This course will provide Introductory foundation to patient-centered pharmaceutical care practice/Medication Therapy Management, by providing the students first practical experiential interaction with patients, hospitals and their organization, administration of patient care-facilities, and drug therapy management system. It will provide the student with experience in retrieving information directly from the patient regarding his health problem (history taking) and drug therapies (treatment history) as well as from medical charts, databases, and from the caregivers using appropriate effective communication in both oral and written forms. In the first segment of the course, the students will learn the practical techniques in small groups during laboratory exercises in interviews supervised by the instructors followed by clinical rotations. Student will participate in supervised counseling of the patients. Student will also observe/study the hospital pharmacy organization in this course.

Course outcomes: After completion of the course the student should be able to:

A. Define Pharmaceutical Care and Medication Therapy Management with their components
B. Retrieve information about patients' life style and health and drug therapy problem, directly from the patients using effective communication skills and also from the hospital record.
C. Record the information (pharmaceutical care history) in a professional manner.
D. Express/present the information/communicate as an effective team member with other health professionals.
E. Hold counseling sessions with patients regarding their health issues, supervised by instructor

Teaching Strategies:

1. Discussions
2. Problem solving
3. Assignments for service learning
4. Experiential learning in Pharmaceutical Care lab

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	30 %	10%	10%	50%

Textbooks:

1. Pharmaceutical Care Practice: The Clinician's Guide, Robert Cipolle, Linda Strand, Peter Morley. Publisher; McGraw-Hill Medical, Ed. 2nd 2004.
2. A Practical Guide to Pharmaceutical Care; A Clinical Skills Primer, John P Rovers, Jay D Currie, Publisher; American Pharmacists Association, Ed. 3rd 2007.
3. http://www.accp.com/docs/positions/misc/coreelements.pdf

Reference Books:

1. Taking The Clinical History, William Demyer, Publisher; Oxford University Press, Ed. 1st 2007.
2. A Practical Guide to Contemporary Pharmacy Practice, Thompson, J E, Publisher; Lippincott Williams & Wilkins, Ed. 3rd 2009.

Pharmaceutical Care-1

Course outcomes and Assessment:

Course outcome	Method of Assessment
A	PB
B	P
C	A/P, PB
D	PB
E	PB

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.					
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.	X	X	X	X	X
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.	X	X	X	X	X
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

2nd Year Summer Semester

IPPE-1

Course Name	IPPE-1			Introductory Pharmacy Practice Experience-1			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 40/week	Lec.	Lab.	Tot.
	PP-3	2030231	0+2		-	-	160
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective cou☐ University requirement						
Level	Summer Semester, 2nd year			Prerequisite	None		

Male students: Community Pharmacies.

Females students: Outpatient Pharmacies of Secondary and Tertiary Health Care Facilities

I. **Students' Activities/**Tasks:

1. Student will spend 8 hours daily on the training site (8 am-4pm) and will complete total of 160 hours.
2. Student will be in professional attire(uniform, lab coat etc) during training period
3. Student will observe the Pharmacist for patients counseling and will share, if allowed by the pharmacist
4. Student will maintain portfolio for all his activities and assignments on daily basis
5. One activity form will be completed daily and will be signed by the preceptor/pharmacist.
6. Daily assignment regarding 5 drug and 5 disease states, will be prepared daily and will be checked by the preceptor during visit and at the end of training.
7. Student will present during 1st semester of 3rd year as per schedule attached
8. Student will produce training completion certificate signed by the Pharmacist

II. **Objectives:**

A. Read drug names, strength and related information form the leaflet.
B. Be familiar with the trade names of all drug classes
C. Prepare list of most commonly used drugs in each class, both trade and generic
D. Read the prescriptions (if allowed by the Pharmacist)
E. Observe and participate in patients' counseling, regarding information about drugs and their use. *(Relevant contents have been added in Pharmaceutical Care-1 course)*
F. Explain the importance of patient confidentiality.

III. **Assessment: (Fail/Pass)**

Assessment of IPPE-1 will be according to the following:

a.	Community Pharmacy Pharmacist :	40%	
b.	COCP Preceptors' visit assessment:	20%	
c.	Portfolio with daily assignments, data record:	20%	
d.	Attendance::		10%
e.	Presentation		10%
	Total:	100%	

Please refer to Manual for Experiential Education for detailed program for IPPE-1

Courses' Description

7.3 Third Year

7.3.1 1st Semester

Course Name	Pharmacology-4			علم الأدوية-4			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 3/week	Lec.	Lab.	Tot.
	PS-13	2010311	3+0		3	0	3
Track	■ Pharmaceutical Sciences ☐ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 3rd year			Prerequisite	2020121		

Course Description:

Lectures: The students shall be provided with knowledge of the pharmacokinetic and pharmacodynamics principles governing the drug actions, adverse drug reactions and drug interactions both in clinical pharmacy practice as well as in basic and clinical research in the area of pharmacology of chemotherapeutic drugs, Antibacterial, antiviral, antiparasitic, antifungal, anticancer and Immune modulating drugs. Dermatological drugs. Introductory pharmacogenetics will also be the part of course

Course Outcomes:

After completion of the course the student will be able to

A. Describe the pharmacodynamics and pharmacokinetics of
   a. antimicrobial drugs,
   b. anticancer drugs
   c. drugs acting on the immune system
B. Apply this knowledge in the specific clinical situations in identifying the problem
C. The students will be able to analyze a related clinical problem and suggest a solution for it.
D. Describe the genetic basis of individualized response to drugs

Teaching Strategies:

1. Lectures
2. Discussion.
3. Problem solving,
4. Case Study with Clinical Applications
5. Home assignments

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10%	30%	0%	10%	50%

Textbooks

1. Basic and Clinical Pharmacology, Bertram Katzung, Susan Masters, Anthony Trevor, Publisher; Lange Basic Science, Ed. 11th 2009.
2. Rang & Dale's Pharmacology, Humphrey P. Rang, Maureen M. Dale, Publisher; Churchill Livingstone, Ed. 7th 2011

Reference Book

1. Goodman and Gilman's The Pharmacological Basis of Therapeutics, Laurence Brunton, Bruce Chabner, Bjorn Knollman, Publisher; McGraw-Hill, Ed. 12th 2010.
2. Clinical Pharmacology, P. N. Bennett, Morris J. Brown, Publisher; Churchill Livingstone/Elsevier, Ed.10th 2008..

Pharmacology-4

Course outcomes and Assessment:

Course outcome	Method of Assessment
A	W
B	W, A/P
C	W, A/P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X				
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.	X	X			
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.		X		X	
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences			X		

Course Name	Pharmaceutical Delivery Systems			نظام إعطاء الدواء			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 2/week	Lec.	Lab.	Tot.
	PS-14	2010312	2+0		2	0	2
Track	■ Pharmaceutical Sciences ☐ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 3rd year			Prerequisite	2010223		

Course Description:

Lectures: This course introduces the concept of pharmaceutical drug delivery system including targeted and controlled drug delivery. Fundamental considerations of sustained release drugs, liposomes, niosomes, microspheres, nanoparticles, parenteral or sterile preparations {Occular drug delivery (calculation related to osmolarity & isotonicity)}, pulmonary drug delivery and radiopharmaceuticals.

Course Outcomes:

At the end of the course, students will be able to:

A. Explain the concept of drug delivery systems
B. Describe fundamentals of sustained / controlled / targeted drug delivery
C. Describe drug carriers and their common applications
D. Recognize the importance of drug carriers with respect to drug delivery
E. Rational use of novel carrier systems such as liposomes, niosomes, microspheres, nanoparticles.

Teaching Strategies:

1. Discussion
2. Lectures
3. Home and Library assignments

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	30 %	0 %	10%	50%

Textbooks:

1. Targeted and Controlled Drug Delivery: Novel Carrier Systems: Vyas S.P, Khar RK, Publisher; CBS Publishers & Distributors. 2010
2. Drug Delivery Systems, Vasant VR and Mannfred AH, Publisher; CRS press, Ed. 2nd 2003.

Reference Books:

1. Pharmaceutics: the Science of Dosage Form Design, Michael E. Aulton, Publisher; Churchill Livingstone, Ed. 2nd 2002.
2. The Science and Practice of Pharmacy. Pharmaceutical Sciences, Gennaro A.R, Remington, Publisher; Lippincott Williams & Wilkins, Ed. 21st 2005.
3. Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems, Ansel H.C. Allen, L.V, Popovich N, Publisher; Williams and Wilkins, Ed. 9th 2010

Pharmaceutical Delivery Systems

Course outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W.P
C	W. A/P
D	W
E	W

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X			X	
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.	X	X	X	X	X
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences		X	X		

Course Name	Medicinal Chemistry-3			كيمياء دوائية-3			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 2/week	Lec.	Lab.	Tot.
	PS-15	2010313	2+0		2	0	2
Track	■ Pharmaceutical Sciences ☐ Biomedical Sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 3rd year			Prerequisite	2010212		

Course Description:

Lectures: This course enables the student to understand the chemistry and mode of action of drugs acting as antibacterials, antivirals, antifungals, antiparasitics and antineoplastics. The following topics will be addressed: chemistry of antibiotics (Beta lactams, tetracyclines, macrolides, rifamycins, chloramphenicol, aminoglycosides, antifungal and polypeptide), antibacterials, antimycobacterials, antivirals, antifungals, antimalarials, anthelmientics, antiscabious, antipedicular agents, antiprotozoal, antibilharazial agents and antineoplastics. Drug design for related drugs.

Course Outcomes:

After completion of this course, the student will be able to:

A. Demonstrate an understanding of the concept of chemotherapy and selective toxicity.
B. Identify the different classification schemes for antibiotics along with knowledge of the history, chemical structures, and pharmacokinetic and pharmacodynamic properties of selected natural and synthetic antimicrobial agents belonging to various classes.
C. Relate the chemical structure of various classes of antimicrobial agents to their biological activity.
D. Classify anticancer agent and describe pharmacodynamic and pharmacokinetic properties of various classes of anticancer agents.

Teaching Strategies:

1. Lectures
2. Discussion
3. Home and Library assignments

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10%	30%	0%	10%	50%

Textbooks :

1. An Introduction to Medicinal Chemistry, Graham L. Patrick, Publisher; Oxford University Press Inc, New York, Ed. 4th 2009.
2. Principles of Medicinal Chemistry, T. L. Lemke, W.O. Foye, David A Williams, Victoria F Roche, S. William Zito, Wolters Kluwer, Publisher; Lippincott Williams and Wilkins, Ed. 6th 2008.

Reference Books :

1. Medicinal Chemistry: An Introduction, G. Thomas; Publisher; John Wiley & Sons Ltd. Ed. 2nd 2007 .
2. Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry. John H. Block, John M. Beale, Jr. Publisher; Lippincott Williams and Wilkins, Ed. 12th 2010.

Medicinal Chemistry-3

Course outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W
C	W
D	W

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X	X	X	X	
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.	X	X	X	X	
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences		X		X	

Course Name	Biopharmaceutics			صيدلة حيوية			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 5/week	Lec.	Lab.	Tot.
	PS-8	2010314	2+1		2	3	5
Track	■ Pharmaceutical Sciences ☐ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 3rd year			Prerequisite	None		

Course Description:

Lectures: This course introduces students to the concept and principles of biopharmaceutics, understanding of clearance, volume of distribution, order of kinetics, compartmental models, plasma protein binding, first pass and second pass metabolism, physicochemical and dosage form factors influencing bioavailability. Assess and measure key biopharmaceutical properties, bioequivalence, and biopharmaceutical classification scheme (BCS). Influence of dosage regimens on the plasma concentration-time profile of a drug in the body and factors involved in steady-state plasma concentration of a drug.

Practicals: Use of semi log graph paper, order of reaction, half life, clearance, area under curve (AUC), C_{max} and t_{max} and other calculations related to biopharmaceutics. Case studies will also be discussed in practical hours

Course Outcomes:

Upon successful completion of this course, students will be able to

A. Express the key concepts of biopharmaceutics and clearance
B. Interpret the relationship between the drug, its dosage form, and route of administration
C. Evaluate the physicochemical and dosage form factors influencing bioavailability of a drug
D. Describe the concept of compartmental modeling and bioequivalence monitoring
E. Identify the relevance between drug delivery optimization and therapeutic outcome

Teaching Strategies:

1. Lectures
2. Discussion
3. Home assignments.
4. Experiential learning (Practical)

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	25 %	25%	0%	40%

Textbook:

1. Aulton's Pharmaceutics, The Design and Manufacture of Medicines. Michael A. Aulton, Publisher; Churchill Livingstone, Ed. 3rd 2007.

Reference Books:

1. Applied Biopharmaceutics & Pharmacokinetics, , L Shargel, S.Wu-Pong, Andrew B.C. Publisher; McGraw-Hill, Ed. 5th 2004.
2. Basic Clinical Pharmacokinetics, , Michael E. Winter, Publisher; Lippincott Williams & Wilkins, Ed. 5th 2009.

Biopharmaceutics

Course outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W
C	W.A/P
D	W.A/P
E	W. A/P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X		X	X	
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.		X	X	X	X
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Therapeutics-1			علاجيا ت-1			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 6/week	Lec.	Pract	Tot.
	PP-4	2030311	4+1		4	3	7
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 3rd year			Prerequisite	2010211		

Course Description:

Lectures: This course will cover introduction clinical laboratory tests and their interpretation and affects on therapy, racial, ethics and gender differences in response to drugs, epidemiology, patho-physiology, clinical presentation, and drug related problems during the management of cardiovascular disorders i.e. cardiovascular testing, cardiopulmonary arrest, hypertension, heart failure, ischemic heart disease, acute coronary syndromes, arrhythmias, venous thromboembolism, stroke, hyperlipidemia, peripheral arterial disease, use of vasopressors and inotropes in the pharmacotherapy of shock, hypovolemic shock. anemias including sickle cell diseases

Practical: Clinical case studies, Case-Assisted Student Centered Learning (CASCL), case presentation followed by case discussion and writing/presentation in SOAP format**.** The students will be required to maintain course portfolio with all case histories discussed. Students will have at least one sessions of Interprofessional Education during the course to interact with other health professionals in relation to clinical case selection, discussion, presentation and reflection.

Course Outcomes: After completion of the course, the student will be able to:

A. Describe and correlate pathophysiology of the diseases included in this course (cardiovascular and coagulation disorders including hyperlipidemia), with clinical presentation and pharmacotherapy.
B. Describe the Clinical (history symptoms and signs) and laboratory data to diagnose the disease.
C. Constitute therapeutic objectives, treatment plan with best evidence available and follow up evaluation plan for diseases included in the course.
D. Write and present given clinical case in SOAP format

Teaching Strategies:

1. Lectures
2. Small Group Discussion,
3. Case-Assisted Student Centered Learning (CASCL)

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10%	25%	25%	0%	40%

Textbooks:

1. Pharmacotherapy: A Pathophysiologic Approach, Joseph T. Dipiro, Robert L. Talbert, Michael Posey, Publisher; McGraw-Hill, Ed. 7th 2008.
2. Applied Therapeutics: The Clinical Use of Drugs, Mary A. Koda, Lloyd Wayne, Joseph Guglielmo. Publisher; Lippincott Williams & Wilkins, Ed. 9th 2009

Reference Books:

1. Pharmacotherapy Casebook, A Patient Focused Approach, Terry L, Publisher; McGraw-Hill, Ed. 7th 2008.
2. . Clinical Pharmacy & Therapeutics, Roger Walker, C.W. Edwards, Publisher; Churchill Livingstone, Ed. 3rd 2007.

Therapeutics-1

Course outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W
C	W, A/P
D	W, PB, P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.					
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.	X	X		X	
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.			X	X	
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.			X	X	
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.			X	X	
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Pharmaceutical Care-2			رعاية صيدلانية-2			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 5/week	Lec.	Lab.	Tot.
	PP-5	2030312	2+1		2	3	5
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 3rd year.			Prerequisite	2030221		

Course Description:

Lectures: This course will cover introduction to concept of pharmacy practice and philosophy of pharmaceutical care, pharmacotherapy plan, patient interview and history taking, communication skills in patient counseling, barriers to effective communication , concept and paradigm of patient counseling , ethical consideration in pharmaceutical care , review of medical records and data collection , interpreting lab values , vital signs assessment and their interpretation, Glasgow coma scale, Morisky scale, beck depression inventory clinical examination of individual organ systems examination of extremities and back, cardiovascular, respiratory, gastrointestinal system, and CNS clinical examination and interpretation, in diagnosis and prognosis of the diseases during pharmacotherapy, standards of care for practitioners.

the course will be jointly taught by pharmacy and medical faculty at the college campus.

Practical: Introduction to equipment, practical demonstration of techniques of physical examination and clinical assessment of disease states, both in simulation lab and clinical setting**.** The student will maintain log book of case studies.

Students will be provided with a minimum of one IPE sessions, with students of other health professions, as an early exposure to IPE environment to prepare them for future collaborative clinical rotations during APPE.

Course Outcomes: Upon successful completion of the course, students will be able to:

A. Perform basic patient assessments methods of human organ systems.

B. Describe, Interpret and record positive findings in physical assessment required for proper pharmaceutical care plan.

C. Interpret the lab reports of the patient for Individualized Therapeutics plan and follow up evaluation.

Teaching Strategies:

1. Lectures
2. Data Interpretation and Problem solving
3. Small Group Discussion
4. Experiential learning in Pharmaceutical Care Lab/simulation Lab

Grading Plan	Quizzes	Midterm	Practical	Assignments	Final Exam
	10 %	25%	25%	0%	40%

Textbook:

1. Patient Assessment in Pharmacy Practice, Rhonda M. Jones, Raylene M. Rospond, Publisher; Lippincott Williams & Wilkins, Ed. 2nd 2007.

Reference Books:

1. Mosby's Guide to Physical Examination, Henry M. Seidel, Jane Ball, Joyce Dains, G. William Benedict, Publisher; Elsevier, Ed. 7th 2010.
2. 2. Pharmaceutical Care Practice: The Clinician's Guide, Robert Cipolle, Linda Strand, Peter Morley. Publisher; McGraw-Hill Medical, Ed. 2nd 2004

Pharmaceutical Care-2

Course outcomes and Assessment:

Course outcome	Method of Assessment
A	PB
B	W, P
C	W, P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.					
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.	X	X	X		
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.	X	X	X		
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.	X	X	X		
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Courses' Description

7.3 Third Year

7.3.2 2nd Semester

Course Name	Therapeutics-2			علاجيا ت-2			
Course Information	Course Code	Course No	Credit Hours	Contact Hours	Lec.	Pract	Tot.
	PP-6	2030321	4+1	6/week	4	3	7
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd Semester, 3rd year			Prerequisite	2020221		

Course Description:

Lectures: This course will cover the patho-physiology and pharmacotherapy of asthma, chronic obstructive pulmonary disease, pulmonary hypertension, drug-induced pulmonary diseases, cystic fibrosis, peptic ulcer disease d, inflammatory bowel diseases, nausea and vomiting, cholecystitis, constipation and diarrhoea, cirrhosis, pancreatitis, drug-induced liver disease, pancreatitis, drug therapy individualization in patients with hepatic disease or genetic alterations in drug metabolizing activity. acute and chronic renal diseases, dialysis, pharmacotherapy of end-stage renal diseases, drug induced kidney diseases, critical care therapy for transplant patients. gout, rheumatoid arthritis and systemic lupus erythromatosis

Practical: Clinical case studies, Case-Assisted Student Centered Learning (CASCL), case presentation followed by case discussion and presentation in SOAP format**.** The students will be required to maintain course portfolio with all the case histories discussed. Students will have at least one session of Interprofessional Education during the course to interact with other health professionals in relation to clinical case selection, discussion, presentation and reflection.

Course Outcomes:

After completion of the course, the student will be able to:

A. Describe and correlate pathophysiology of the diseases included in this course.
B. Describe and correlate the clinical (history symptoms and signs) and laboratory data to diagnose the disease.
C. Constitute therapeutic objectives, treatment plan with best evidence available and follow up evaluation plan for diseases included in the course.
D. Write and present the given clinical case in SOAP format

Teaching Strategies:

1. Lectures
2. Small Group Discussion, followed by students presentations
3. Case-Assisted Student Centered Learning

Grading Plan	Quizzes	Midterm	Practical	Assignments/Log	Final Exam
	10%	25%	25%	0%	40%

Textbooks:

3. Pharmacotherapy: A Pathophysiologic Approach, Joseph T. Dipiro, Robert L. Talbert, Michael Posey, Publisher; McGraw-Hill, Ed. 7th 2008.
4. Applied Therapeutics: The Clinical Use of Drugs, Mary A. Koda, Lloyd Wayne, Joseph Guglielmo. Publisher; Lippincott Williams & Wilkins, Ed. 9th 2009

Reference Books:

3. Pharmacotherapy Casebook, A Patient Focused Approach, Terry L, Publisher; McGraw-Hill, Ed. 7th 2008.
4. Clinical Pharmacy & Therapeutics, Roger Walker, C.W. Edwards, Publisher; Churchill Livingstone, Ed. 3rd 2007.

Therapeutics-2

Course outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W
C	W, A/P
D	W, PB, P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.					
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.	X	X			
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.			X	X	X
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.			X	X	X
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.			X	X	
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Pharmaceutical Care-3			رعاية صيدلانية-3			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 2/week	Lec.	Lab.	Tot.
	PP-7	2030322	2+0		2	0	2
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd Semester, 3rd Year.			Prerequisite	2030312		

Course Description:

Lectures: In continuation of Pharmaceutical Care1 and 2, this course will cover, in depth, concepts of medication therapy management, including medication therapy review, personal medication record (PMR),medication-related action plan (MAP), intervention and/or referral, documentation and follow-up in patient centered pharmaceutical care.

the course will include clinical management of diseases and incorporating clinical guidelines into pharmaceutical care. patient assessment in relation to drug related problems, data collection, developing and implementing action plan, principles of communication of action plan to the patient and health care providers, pharmacotherapy case presentations, decision making (decision making tree and other techniques), documentation (SOAP and other data collection and recording techniques) in medication therapy management, drug therapy problems, follow up plan and adherence/compliance issues in pharmaceutical care, interventions in therapeutic made by the pharmacist and their effects health and economic outcomes pharmaceutical care concerns in pediatrics' geriatrics, and women health. interpreting patients' data/record for drug use evaluation, drug audit, medication error and adverse drug reactions. ethical standards and professionalism in pharmaceutical care practice.

Course Outcomes: Upon successful completion of the course the student should be able to:

A. Describe and signify the principles and components of pharmaceutical care practice including Medication Therapy Management.
B. Demonstrate the ability (in assignments and presentation) to Identify drug therapy problem,
C. Construct pharmaceutical care plan, follow up evaluation, and document the necessary data in pharmaceutical care practice & Present pharmacotherapy case.
D. Participate in the pharmaceutical care system's process for reporting and managing medication errors and adverse drug reactions.
E. Communicate and collaborate with prescribers, patients, caregivers, and other involved health care providers to engender a team approach to patient care

Teaching Strategies:

1. Lectures
2. Small Group Discussion, followed by students presentations
3. Projects and assignments
4. Case-Assisted Student Centered Learning

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	30%	0%	10%	50%

Textbooks:

1. Pharmaceutical Care Practice: The Clinician's Guide, Robert Cipolle, Linda Strand, Peter Morley. Publisher; McGraw-Hill Medical, Ed. 2nd 2004.
2. A Practical Guide to Pharmaceutical Care; A Clinical Skills Primer, John P Rovers, Jay D Currie, Publisher; American Pharmacists Association, Ed. 3rd 2007.
3. http://www.accp.com/docs/positions/misc/coreelements.pdf
4. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2865406/

Reference Books:

1. Handbook of Pharmacy Health Care, Robin J. Harman, Pamela Mason, Publisher; London Pharmaceutical Press. Ed. 2nd 2007.
2. Social and Behavioural Aspects of Pharmaceutical Care. Nathaniel M Rickles, Albert I

Wertheimer, Mickey C Smith. Publisher; Jones & Bartlett, Ed. 2nd 2009.
3. Clinical Pharmacy & Therapeutics, Roger Walker, C.R.W. Edwards. Publisher; Churchill Livingstone, Ed. 3rd 2007.

Pharmaceutical Care-3

Course outcomes and Assessment:

Course outcome	Method of Assessment
A	W
B	W, A/P, P
C	W
D	PB
E	PB

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.					
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.	X	X	X	X	X
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.	X	X	X	X	X
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.		X	X		
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice	X				
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Institutional Pharmacy Practice			ممارسة صيدلانية مؤسسية			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 1/week	Lec.	Lab.	Tot.
	PP-8	2030323	1+0		1	0	1
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd Semester, 3rd year.			Prerequisite	None		

Course Description:

Lectures: This course is aimed at providing the students with insight into institutional pharmacy practice and will be followed by experiential summer training in hospital pharmacy. Lecture topics will include: hospital formulary; Inpatient outpatient and satellite/floor pharmacies; hospital pharmacy supplies, storage, indent; inventory control methods and medication distribution systems, automation in pharmacy practice; unit dose system, intravenous admixtures, controlled drugs/substance management; Investigational drugs in the hospital pharmacies; prescription and medication errors, medication safety; medication reconciliation, pharmacy and therapeutics committee, principles of education of nurses and other paramedics.

Course Outcomes: Upon completion of the course, students will be able to:

A. Describe the institutional pharmacy set up and functions
B. Describe the role and duties of hospital pharmacist in health system

Teaching Strategies:

1. Lectures.
2. Active learning: Discussions
3. Assignments

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	30%	0%	10%	50%

Textbooks:

1. Handbook of Institutional Pharmacy Practice, Thomas R. Brown, Publisher; American Society of Hospital Pharmacist, Ed. 4th 2006.
2. Hospital Pharmacy, Martin Stephen, Publisher; Pharmaceutical Press, Ed. 1st 2002

Reference Books:

1. Remington: The Science and Practice of Pharmacy, Patrick J. Sinko, Publisher; Lippincott Williams & Wilkins. Ed. 21st 2006.
2. Boh's Pharmacy Practice Manual: A Guide to the Clinical Experience. Susan M. Stein. Publisher; Lippincott Williams & Wilkins. Ed. 3rd 2009.
3. Introduction to Hospital and Health-system Pharmacy Practice, David Holdford , Thomas Brown, Publisher; American Society of Health-System Pharmacists. Ed. 1st 2010.

Institutional Pharmacy Practice

Course outcomes and Assessment:

Course outcome	Method of Assessment
A	W
B	W. A/P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.					
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.	X	X			
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice	X	X			
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	First Aid and Emergency Medicine			الإسعافات الأولية و طب الطواري			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 3/ week	Lec.	Lab.	Tot.
	PP-9	2030324	0 + 1		0	3	3
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd Semester 3rd year			Prerequisite	2020121		

Course Description:

Practical: Introduction to first aid and emergency medicine, triage and referral skills for all ages and all systems of the body. management of the injured patient and shock, maintenance of airway passages and intravenous line, cardiovascular resuscitation, basic life support, management of bleeding, open wounds, fractures, epilepsy, coma, sunstroke, animal bites, high grade fever, burns, poisoning, drowning, head injuries and emergency procedures at home, work, or leisure. students will be required to successfully complete approved course on bls in hospital in an IPE environment

Course Outcomes:

Upon successful completion of the course the student will be able to

A. Discuss the basic principles of first aid and emergency medicine
B. Manage clinical emergencies
C. Demonstrate ability to provide basic life saving techniques.

Teaching Strategies:

1. Lectures
2. Discussion
3. Simulations.
4. Experiential training (Approved course on BLS in and IPE environment)

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	25 %	25%	0%	40%

Textbooks :

1. First Aid Manual: The Step by Step Guide for Everyone**.** St. John Ambulance, St. Andrew' Ambulance Association, British Red Cross Society, Publisher; Penguin Press, Ed. 9th 2009.
2. Practical First Aid, Dorling Kindersley, Ed. 1st .2009.

Reference Books :

1. Accident and Emergency: Theory into Practice Brian Dolan, Holt-London: Bailliere Tindall. Ed. 1st 2000.
2. Accident and Emergency Medicine: A survival Guide, Banerjee, Publidher; Saunders, Ed. 1st 2005.

First Aid and Emergency Medicine

Course outcomes and Assessment:

Course outcome	Method of Assessment
A	W. PB
B	PB
C	PB

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.					
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.	X				
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.		X	X		
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.		X	X		
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Research Methodology and Biostatistics			منهجية البحث والإحصاء الحيوي			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 5/ week	Lec.	Lab.	Tot.
	PP-10	2030325	2+1		2	1	5
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd Semester, 3rd year.			Prerequisite	2020213		

Course Description:

Basic principles of biostatistics and research methodology have also been included in this course such as, the research process, scales of measurement, accuracy of data, validity and reliability), research design (objective, literature review, sampling, types of design), clinical trial design (controlled multi-centered studies, random allocating, study types, blindness, placebo effect, retrospective and case studies, data collection forms). Individual variation, statistical terminology, errors of sampling, probability concepts, distribution of random variables, non-parametric methods, validity of results, analysis of variance and tests for significance, choice of proper tests for significance, statistical methods applied to biological assays and proper experimental design. During the course of study the students are divided in groups and each group is assigned a topic to develop a research proposal and defend it.

Course Outcomes:

Upon successful completion of the course the student will be able to:

A- Describe the basic principles of research methodology and Biostatistics.
B- Describe how to collect, analyze and present data
C- Design a scientific project by applying the knowledge gained from the course
D- Summarize the data available in the literature on a particular topic and discuss with peers.

Teaching Strategies:

1. Lectures.
2. Discussions and students presentations
3. Home and library Assignments.

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	25%	0%	25%	40%

Textbooks:

1. Statistics and Scientific Method: An Introduction for Students and Researchers Peter J. Diggle , Amanda G. Chetwynd; Oxford University Press, Ed.1st 2011
2. Introduction to Medical Statistics and Research Methodology, C.A. Klufio, Woeli Publishing Services. ED 1st.2003.

Reference Books:

1. Fundamentals of Biostatistics, Bernard Rosner. Duxbury Press; Ed 7th, 2010
2. Practical Research: Planning and Design, Paul D. Leedy (Author), Jeanne Ellis Ormrod; Prentice Hall; Ed 9, 2009

Research Methodology and Biostatistics

Course outcomes and Assessment:

Course outcome	Method of Assessment
A	W
B	A/P. P
C	W.A/P
D	W.A/P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X	X			
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences	X	X	X	X	

Course Name	Natural Products & Herbal Medicine			النواتج الطبيعية وطب الأعشاب			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 3/ week	Lec.	Lab.	Tot.
	PS-17	2010321	2 +0		2	0	2
Track	■ Pharmaceutical Sciences ☐ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd Semester, 3rd year			Prerequisite	2010213		

Course Description:

Lectures: The course includes study of wide range of active constituents, their extrication methods, isolation, identification and assay, in addition to identification of the marketed drugs containing these active constituents. Also, the course includes the different ways of adulteration and the different methods to detect these adulterations in order to standardize and apply quality control to herbal drugs. The course also deals with herbal medicine, current classes and application.

At the end of this course the students will have a basic background in phytochemistry to be applied in pharmacy practice, including the detailed studies about active constituents in the taught systems. In addition the students will be able to build their basic background in herbal medicine.

Detailed learning objectives provided for each lecture and exercise session are the basis for assessment.

Course Outcomes:

At the end of course, the students will be able to

A. Describe natural products obtained from plant, animals and mineral origin, used as a drugs.
B. Discuss the application and use of natural products in practice and pharmaceutical industry.
C. Describe the role of developing herbal drugs in research.
D. Apply the knowledge of affordable alternative medicine in pharmacotherapy.

Teaching Strategies:

1. lectures
2. Tutorials and discussions
4. Problem solving
5. Home and Library assignments

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10%	30%	0%	10%	50%

Textbooks:

1. Joanne Barnes, Elizabeth M. Williamson, Michael Heinrich and Simon Gibbons, Fundamentals of Pharmacognosy and Phytotherapy, Elsevier Health Sciences
2. Clarke, E. C. G., "Isolation and Identification of Drugs", the Pharmaceutical Press, London

Reference Books:

1. Fundamentals of Pharmacognosy and Phytotherapy by Michael Heinrich, Joanne Barnes, Simon Gibbons, and Elizabeth M. Williamson (2004)
2. The Complete German Commission E Monographs. Therapeutic Guide to Herbal Medicines, Mark Blumenthal, Senior Editor, American Botanical Council, Integrative Medicine Communications, Boston, Massachusetts (1998). Health Science Library (HSL).
3. Rational Phytotherapy, A Physicians Guide to Herbal Medicine, V. Schulz, R. Haensel, V.E. Tyler, Springer Publishers, Berlin,
4. Botanical Medicines, The Desk Reference for Major Herbal Supplements, D.J. McKenna, K. Jones, K. Hughes, The Haworth Herbal Press, New York, ISBN: 0-7890-1265-0.
5. Natural Medicines Comprehensive Database (www.naturaldatabase.com

WHO monographs on selected medicinal plants, World Health organization , Paperback vol. 1 (1999) and vol. 2 (2004

Natural Products & Herbal Medicine

Course Outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W. A/P
C	W
D	W

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the Course Outcomes with Pharm.D. Program Outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	**X**				
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.				X	
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice		X	X		
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Industrial Pharmacy			الصيدلة الصناعية			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 2/week	Lec.	Lab/Indust	Tot.
	PS-19	2010322	2+0		2	0	2
Track	■ Pharmaceutical Sciences ☐ Biomedical sciences ☐ Pharmacy Practice ■ Elective course ☐ University requirement						
Level	2nd Semester, 3rd year			Prerequisite	2010223		

Course Description:

Lectures: This course describes the manufacturing facilities, main unit operations that take place in the pharmaceutical industry and related equipment carrying out such operations. These operations include heat transfer and related pharmaceutical processes such as freeze drying, spray drying and drug stability studies. United States Pharmacopeia, FDA guidelines and fundamental considerations of good manufacturing practice (GMP) and quality control.

Course Outcomes:

At the end of the course, students will be able to:

A. Examine the selection, design and utilization of a pharmaceutical manufacturing facility
B. Define, differentiate and write report on the basic concept of unit operations
C. Investigate the various machines carrying out such operations
D. Observe good manufacturing practice (GMP) compliance
E. Organize drug stability studies

Teaching Strategies:

1. Lectures.
2. Group Discussions
3. Assignments

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10%	30%	0%	10%	50%

Textbook:

1. The Theory and Practice of Industrial Pharmacy, Lachman L, and Liberman H. A, Publisher; CBS Publishers & Distributors, 2009.

Reference Books:

1. Pharmaceutics: the Science of Dosage Form Design, Michael E. Aulton, Publisher; Churchill Livingstone, Ed. 2nd 2002.
2. Remington: The Science and Practice of Pharmacy, Patrick J. Sinko, Publisher; Lippincott Williams & Wilkins. Ed. 21st 2006.

Industrial Pharmacy

Course Outcomes and Assessment

Course outcome	Method of Assessment
A	W.P
B	W.P
C	W.P
D	W.P
E	W

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book)

Mapping of the Course Outcomes with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X	X			
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.	X				X
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Principles of Drug Design			مبادئ تصميم الأدوية			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 3/ week	Lec.	Lab.	Tot.
	PS-20	2010323	2		2	-	2
Track	■ Pharmaceutical Sciences ☐ Biomedical sciences ☐ Pharmacy Practice ■ Elective course ☐ University requirement						
Level	· 2nd Semester, 3rd year			Prerequisite	2010313		

Course Description:

Lectures: This course provides an introduction on the principles of drug design and the development of new therapeutic agents from prototype compounds with special emphasis on drug action at the molecular level. The following topics will be addressed: overview of drug discovery and drug development, targets for biologically active molecules, structure-activity relationships, isosterism, pro-drug design and applications and drug metabolism.

Course Outcomes:

Upon successful completion of this course the student should be able to:

A. Describe the chemical basis for some of the known mechanisms of drug action.
B. Identify the role of molecular modification in the development of new drugs; its successes, shortcomings and failures
C. Discuss different techniques and processes of structure-based drug design
D. Define the role of denovo and molecular modeling techniques in the development of new drugs

Teaching Strategies:

1. Lectures..
2. Discussion.
3. Home and library assignments.

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10%	30%	0%	10%	50%

Textbooks:

1. An Introduction to Medicinal Chemistry, Graham L. Patrick, Publisher; Oxford University Press Inc, New York, Ed. 4th 2009.
2. Smith and William's Introduction to the principles of drug design and action, H. John Smith, Publisher; Harvard Academic Publishers, Ed. 3rd 1998.

Reference Books:

1- Principles of Medicinal Chemistry, T. L. Lemke, W.O. Foye, David A Williams, Victoria F Roche, S. William Zito, Wolters Kluwer, Publisher; Lippincott Williams and Wilkins, Ed. 6th 2008.

2- Textbook of Drug Design and Discovery, P. Krogsqaard-Larsen, U. Madsen, Kristian Stromgaard, Publisher; Tailor and Francis, New York, Ed 4th 2009.

Principles of Drug Design

Course outcomes and Assessment:

Course outcome	Method of Assessment
A	W
B	W
C	W. A/P
D	W.A/P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X	X	X	X	
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.	X	X	X	X	
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

7.3.3 3rd year Summer Semester

IPPE-2

Course Name	IPPE-2			Introductory Pharmacy Practice Experience-2			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 40/week	Lec.	Lab.	Tot.
	PP-11	2030331	2+0		-	-	160
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	Summer Semester, 3rd year			Prerequisite	None		

After successful completion of IPPE-2, student will be able to:

Demonstrate knowledge and skills to work in

A. out patient pharmacy (including ambulatory care), prescription handling, prescription filling and patients counselling
B. In patient Pharmacy handling unit dose, inpatient order entry, extemporaneous preparations
C. IV admixtures and parenteral nutrition
D. Unit of Controlled drugs/narcotics procurement storage, issue and entry
E. Team of health care professionals exhibiting appropriate professionalism and interpersonal skills

Assessment of IPPE-2 (Fail/pass)

a. **Hospital/external Preceptor: 40 %**
b. **COCP preceptor/visits 20%**
   i. Question answer session
   ii. Portfolio updated
   iii. Hospital Preceptor comments
c. **Attendance: 160 hours: 10%**
d. **Portfolio: 20%**
e. **Presentation: 10%**
f. **Total: 100%**

F.

Courses' Description

7.4 Fourth Year

7.4.1 1st Semester

Course Name	Law and Ethics in Pharmacy Practice			أخلاقيات وقانون الصيدلة			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 1/week	Lec.	Lab.	Tot.
	PP-12	2030411	1+0		1	0	1
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 4th year			Prerequisite	2030111		

Course Description:

Lectures: Governmental laws, regulations, detailed laws that govern and affect the practice of pharmacy such as drugs, narcotics and medical devices. General legal principles, non-controlled prescription requirements and over the counter drug requirements. Responsibilities of the pharmacist on the care of patients. Professional code of conduct, Common ethical issues and considerations, Identification of ethical problems and their workup.

Course Outcomes:

After completion of the course the student should be able to:

A. Describe national laws and regulations that govern practice of pharmacy in the country.
B. Describe codes of conduct for a pharmacist, standards of pharmacy practice and principles for solving ethical issues during pharmacy training and professional practice.

Teaching Strategies:

1. Lectures.
2. Discussion.

Grading Plan	Quizzes	Midterm	Practical	Assignments	Final Exam
	10 %	30%	0%	10 %	50%

Textbooks:

1. Pharmacy Law and Ethics, Gorden E. Appelbe, Joy Wingfield, Lindsay M. Taylor, Publisher; Pharmaceutical Press, . Ed. 2nd 2009.
2. Pharmaceutical Care Practice: The Clinician's Guide, Robert Cipolle, Linda Strand, Peter Morley. Publisher; McGraw-Hill Medical, Ed. 2nd 2004.

Reference Books:

1. Practical Exercises in Pharmacy Law and Ethics, Gorden E. Appelbe, Joy Wingfield and Lindsay M. Taylor, Publisher; Pharmaceutical Press. Ed. 2nd 2006.

Law and Ethics in Pharmacy Practice

Course outcomes and Assessment:

Course outcome	Method of Assessment
A	W
B	W

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.					
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.	X	X			
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice	X	X			
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Therapeutics-3			علاجيا ت-3			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 6/week	Lec.	Pract	Tot.
	PP-13	2030412	4+1		4	3	7
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st semester, 4th year			Prerequisite	2010221		

Course Description:

Lectures: This course will focus on the pharmacotherapy, patho-physiology of following disorders , endocrinologic disorders: diabetes mellitus, diseases of thyroid and parathyroid gland, , adrenocortical disorders, disorders of calcium metabolism: osteoporosis, women health: gynecologic diseases, contraception, hormone replacement therapy. central nervous system and psychiatric disorders: Parkinson's disease, epilepsy, Alzheimer's disease, multiple sclerosis. psychiatric disorders: anxiety, depression, bipolar disorders , mood and sleep disorders, attention deficit/hyperactivity disorders (ADHD), , schizophrenia, alcoholism & substance abuse smoking cessation

Practical: Clinical case studies, Case-Assisted Student Centered Learning (CASCL), case presentation followed by case discussion and presentation in SOAP format**.** The students will be required to maintain a portfolio containing all the case histories discussed during practical sessions. Students will have at least one session of Interprofessional Education during the course to interact with other health professionals in relation to clinical case selection, discussion, presentation and reflection.

Course Outcomes:

After completion of the course, the student will be able to:

A. Describe and correlate pathophysiology of the diseases included in this course with clinical presentation and pharmacotherapy.
B. Describe the Clinical (history symptoms and signs) and laboratory data to diagnose the disease.
C. Constitute therapeutic objectives, treatment and follow up evaluation plan for diseases included in the course, using appropriate guidelines
D. Write and present the given clinical case in SOAP format

Teaching Strategies:

1. Lectures
2. Small Group Discussion, followed by students presentations
3. Case-Assisted Student Centered Learning (CASCL)

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10%	25%	25%	0%	40%

Textbooks:

1. Pharmacotherapy: A Pathophysiologic Approach, Joseph T. Dipiro, Robert L. Talbert, Michael Posey, Publisher; McGraw-Hill, Ed. 7th 2008.
2. Applied Therapeutics: The Clinical Use of Drugs, Mary A. Koda, Lloyd Wayne, Joseph Guglielmo. Publisher; Lippincott Williams & Wilkins, Ed. 9th 2009.

Reference Books:

1. Pharmacotherapy Casebook, A Patient Focused Approach, Terry L, Publisher; McGraw-Hill, Ed. 7th 2008.
2. Clinical Pharmacy & Therapeutics, Roger Walker, C.W. Edwards, Publisher; Churchill Livingstone, Ed. 3rd 2007

Therapeutics-3

Course outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W
C	W, A/P
D	W, P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.					
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.	X	X			
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.			X	X	X
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.			X	X	
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.			X	X	
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Drug Information Services			خدمات المعلومات الدوائية			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 4/week	Lec.	Lab.	Tot.
	PP-14	2030413	2+1		2	1	1
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 4th Year			Prerequisite	2030311		

Course Description:

This course will provide the students with concept and scope of Drug Information Services in health care system. The course will have preview of the process/steps involved in its approval for clinical use by FDA. It will include sources, types and evaluation of drug information resources, searching for drug information resources to respond to the drug information requests, critical evaluation of the results, using an evidence based approach with knowledge of levels of clinical evidence. Fundamentals of research including measures, reliability, validity, ethical concerns, types of various research studies and level of clinical evidence will also be reviewed in this course. The course will also cover the formulation of clinical question from a given clinical scenario and responding to such questions after literature search and critical appraisal of the result.

Course Outcomes:

Upon completion of the course, the student will be able to

A. Describe concepts, scope and resources of Drug Information
B. Define primary, secondary and tertiary literature resources
C. Define evidence based practice and use in retrieving information to respond to drug information requests and clinical questions
D. Critically evaluate the retrieved information for application in practice
E. Effectively communicate and disseminate the required information to health care providers and general population

Teaching Strategies:

1. Lectures.
2. Case studies/discussions
3. Home and library assignments
4. Service learning (by answering questions from community regarding drugs and their usage)

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	30 %	0 %	10 %	50 %

Textbooks:

1. Lexi-Comp's Drug Information Handbook, Charles F. Lacy Lora L. Armstrong, Morton P. Goldman, Leonard L. Publisher; Lance Lexi-Comp. Ed. 17th 2008.
2. Evidence-Based Practice: A Primer for Health Care Professionals, Philip T. Davies, Martin Dawes, Kate Seers, Robin Snowball, Publisher; Churchill Livingstone. Ed. 3rd 2005.

Reference Books:

1. Drug Information: A Guide for Pharmacist, Patrick M. Malone, Karen L. Kier, John Stanovich, Publisher; McGraw-Hill/Appleton & Lange, Ed.2nd 1996.
2. Evidence-Based Medical Ethics: Cases for Practice-Based Learning, John E. Snyder, Candace C. Gauthier, Rosemarie Tong, Publisher; Humana Press, Ed. 1st 2008.

Drug Information Services

Course outcomes and Assessment:

Course outcome	Method of Assessment
A	W
B	W
C	W. A/P
D	W. A/P
E	W/A.P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.					
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.			X	X	
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.	X	X	X	X	X
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Clinical Pharmacokinetics			حركية الدواء الإكلينيكية			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 5/ week	Lec.	Lab.	Tot.
	PP-15	2030414	2+1		2	3	5
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 4th Year			Prerequisite	2010314		

Course Description: This course will focus on the basic principles of pharmaco-kinetic for the purpose of optimizing drug therapy and Therapeutic drug monitoring with the emphasis on clinical pharmacokinetics of the following drugs: aminoglycosides antibiotics, carbamazepine, cyclosporine, digoxin, ethosuximide, lidocaine, lithium, methotrexate, phenobarbital, phenytoin, procainamide, quinidine, salicylates, theophylline, tricyclic antidepressants, valproic acid and vancomycin).

Practical: Group discussions on clinical problems/case scenarios aiming at interpretation of given data in the case scenario and solving the problem in terms of individualized dose calculation to optimize the drug therapy for that particular case/situation

Course Outcomes: Upon successful completion of this course the student will be able to:

A. Describe and apply the principles of pharmacokinetics in optimizing the drug therapy.
B. Define and describe the principles of TDM.
C. Identify the related clinical problem.
D. Analyze, calculate and suggest the dose or treatment in special situations.

Teaching Strategies:

1. Lectures.
2. Active learning by Data interpretation & Problem solving.
3. Small group discussion

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10%	30%	0%	10%	50%

Textbooks:

1. Concepts in Clinical Pharmacokinetics, Joseph T. DiPiro, William J. Spruill, Publisher; American Society of Health-System Pharmacists. Ed. 3rd 2005
2. Applied Clinical Pharmacokinetics, Laurry Bauer, Publisher; McGraw-Hill Medical, Ed. 1st 2008.

Reference Books:

1. Therapeutic Drug Monitoring, Schumacher G.E, Publisher; Appleton and Lange, Ed. 1st 1995.
2. Applied Pharmacokinetics: Principles of Therapeutics: Drug Monitoring, W.E. Evans, J. J. Schentag, W. J. Jusko Spokane, Publisher; Lippincott Williams & Wilkins, Ed. 3rd 1992.

Clinical Pharmacokinetics

Course Outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W.A
C	W.A/P
D	W.A/P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping Of The Course Outcomes with the Pharm.D. Program Outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X				
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.	X	X		X	
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.		X		X	
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Parenteral Nutrition			التغذية الوريدية الكلية			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 1/week	Lec.	Lab.	Tot.
	PP-16	2030415	1+0		1	0	1
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 4th Year.			Prerequisite	2020212		

Course Description: This course will cover; principles of healthy nutrition, nutritional assessment and need in hypertension and cardiovascular diseases; critically ill patients; gastrointestinal diseases ; renal disease ; pulmonary diseases, HIV/AIDS ;metabolic stress ;neoplastic diseases ; rheumatic diseases ; nutrition and anemias ; neurological and mental disorders. Introduction to nutrition support. Parenteral Nutrition: its concept, preparation, calculation and facilities required. Enteral nutrition background, preparation and calculation. Relevant case studies.

Course Outcomes:

After completion of the course the student should be able to:

A-Describe the basic concept and principles of parenteral nutrition

B- Calculate the nutritional requirement of a critically ill patient and for diseases mentioned in the course

Teaching Strategies:

1. Lectures.
2. Discussion.
3. Assignments
4. Case studies

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	30%	0%	10%	50%

Textbooks:

1- Medical Nutrition and Disease: A Case-Based Approach.. Lisa Hark, Gail Morrison, Publisher; Wiley-Blackwell, Ed. 4th 2009.

2- Essentials of Human Nutrition Jim Mann, Stewart Truswell, Publisher; Oxford University Press, Ed. 2nd 2003.

Reference Books:

1. Remington: The Science and Practice of Pharmacy, Patrick J. Sinko, Publisher; Lippincott Williams & Wilkins. Ed. 21st 2006.
2. Enteral and Tube Feeding, Rolando H Rolandelli, Publisher; Elsevier, Ed. 4th 2004**.**

Parenteral Nutrition

Course Outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W.A

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping Of The Course Outcomes with the Pharm.D. Program Outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X				
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.	X	X			
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.		X			
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Pharmacoeconomics			اقتصاديات الدواء			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 1/ week	Lec.	Lab.	Tot.
	PP-17	2030416	1+0		1	0	1
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	1st Semester, 4th year			Prerequisite	None		

Course Description:

Lectures: Introduction to pharmacoeconomics, implication of pharmacoeconomics in pharmacy, investigating pharmacoeconomics research question, quality of life and quality adjusted life years , measuring cost, cost minimization analysis, cost effective analysis , cost benefit analysis , cost utility analysis , sensitivity analysis , decision analysis, daily dose calculation.

Course Outcomes:

Upon successful completion of this course the student will be able to:

A. Comprehend basic financial and operational knowledge about Pharmaco-economics and its implication in Pharmacy Profession.

B. Apply the concepts, methods of decision making, and cost effectiveness in clinical studies and selection of drugs.

Teaching Strategies:

1. Lectures.
2. Discussion.
3. Case studies
4. Assignments and Projects

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	30%	0%	10%	50%

Textbooks:

1. Introduction to Applied Pharmacoeconomics, Randy Vogenberg, Publisher; McGraw-Hill/Appleton & Lange, Ed. 1st 2000.
2. Essentials of Pharmacoeconomics, Karen Rascati, Publisher; Lippincott Williams & Wilkins, Ed. 1st 2008.

Reference Books:

1. Remington: The Science and Practice of Pharmacy, Patrick J. Sinko, Publisher; Lippincott Williams & Wilkins, Ed. 21st 2006
2. Pharmacoeconomics From theory to practice, Andrew a. Carmen, Publisher; CRC press. Ed. 13th 2009.

Pharmacoeconomics

Course Outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W.A

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping Of The Course Outcomes with the Pharm.D. Program Outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
9.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X				
10.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
11.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.	X	X			
12.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.		X			
13.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
14.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
15.	Use basic principles of organizational and management in skills in pharmaceutical services and practice	X	X			
16.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Courses' Description

7.4 Fourth Year

7.4.2 2nd Semester

Course Name	Clinical Toxicology			علم السموم التطبيقي			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 2/ Week	Lec.	Lab.	Tot.
	PS-18	2010421	2+0		2	0	2
Track	■ Pharmaceutical Sciences ☐ Biomedical sciences ☐ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd Semester, 4th year			Prerequisite	2010124		

Course Description:

Lectures: Definitions of toxicodynamics, toxicokinetics, toxic responses, target organ toxicity, carcinogenicity, mutagenicity, teratogenicity, management of poisoned patient: decontamination, supportive care, antidotes, clinical toxicology of drugs: digoxin, aminophylline, beta blockers, calcium channel blockers, anticoagulants, benzodiazepines, antidepressants, antipsychotics, opioids, NSAIDs, antidiabetic agents, Clinical toxicology of air pollutants, solvents: alcohols, insecticides, herbicides and pesticides. Toxicology of heavy metals

Course Outcomes:

After the completion of the course the student will be able to

A. Define and describe toxicodynamics and toxicokinetics including target organ toxicity, carcinogenicity, teratogenicity and mutagenicity
B. Describe the management of poisoned patients
C. Apply the concepts of toxicology in a related clinical situation to identify and manage the problem

Teaching Strategies:

1. Lectures.
2. Discussions
3. Problem solving.
4. Projects and Assignments.
5. Case studies

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10%	30%	0%	10%	50%

Textbooks:

1. Introduction to Toxicology, John A. Timbrell, Ed. 3rd 2001.
2. Haddad and Winchester's Clinical Management of Poisoning and Drug Overdose, Michael W. Shannon, Ed. 2nd 2007.

Reference Books:

1. Emergency toxicology, Peter Viccellio, Lippincott Raven, 1998.
2. Basic and Clinical Pharmacology, Bertram Katzung, Susan Masters, Anthony Trevor, Publisher; Lange Basic Science, Ed. 11th 2009.

Clinical Toxicology

Course Outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W, A/P
C	W, A/P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the Course outcomes with Pharm.D. outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X				
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.	X	X			
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.		X	X		
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Therapeutics-4			علاجيات-4			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 6/week	Lec.	Pract.	Tot.
	PP-18	2030421	4+1		4	3	7
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd semester , 4th year			Prerequisite	2010311		

Course Description:

Lectures: Pathophysiology and management of Infectious Diseases:
upper respiratory infections, pneumonia, tuberculosis, urinary tract, intra-abdominal and gastrointestinal tract infections, infective endocarditis, central nervous system sexually transmitted diseases, acquired immunodeficiency syndrome (AIDS), mycotic infections, surgical antibiotic prophylaxis, , bacteremia and sepsis, skin and soft tissue infections, immunization therapy
Supportive/palliative care therapy in cancer patients, chronic leukemias, lymphomas, , lungs cancer, , prostate cancer, breast cancer, , liver tumours, management of burn patients, issues in pediatrics/ neonates and geriatric drug therapy.

Practical: Clinical case studies, Case-Assisted Student Centered Learning (CASCL), case presentation followed by case discussion and presentation in SOAP format**.** The students will be required to maintain a portfolio containing all the case histories discussed during practical sessions. Students will have at least one session of Interprofessional Education during the course to interact with other health professionals in relation to clinical case selection, discussion, presentation and reflection.

Course Outcomes: After completion of the course, the student will be able to:

A. Describe and correlate pathophysiology of the diseases included in this course (cardiovascular and coagulation disorders including hyperlipidemia), with clinical presentation and pharmacotherapy.
B. Describe the Clinical (history symptoms and signs) and laboratory data to diagnose the disease.
C. Design therapeutic objectives, treatment plan with best evidence available and follow up evaluation plan for diseases included in the course, using appropriate guidelines
D. Write and present the given clinical case in SOAP format

Teaching Strategies:

1. Lectures
2. Small Group Discussion, followed by students presentations
3. Case-Assisted Student Centered Learning

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects/log	Final Exam
	10%	25%	25%	0%	40%

Textbooks:

1. Pharmacotherapy: A Pathophysiologic Approach, Joseph T. Dipiro, Robert L. Talbert, Michael Posey, Publisher; McGraw-Hill, Ed. 7th 2008.
2. Applied Therapeutics: The Clinical Use of Drugs, Mary A. Koda, Lloyd Wayne, Joseph Guglielmo. Publisher; Lippincott Williams & Wilkins, Ed. 9th 2009

Reference Books:

1. Pharmacotherapy Casebook, A Patient Focused Approach, Terry L, Publisher; McGraw-Hill, Ed. 7th 2008.
2. Clinical Pharmacy & Therapeutics, Roger Walker, C.W. Edwards, Publisher; Churchill Livingstone, Ed. 3rd 2007.

Therapeutics-4

Course outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W
C	W, A/P
D	W, P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.					
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.	X	X			
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.			X	X	
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.			X	X	
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.			X	X	
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Pharmacy Management			إدارة صيدلية			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 2/week	Lec.	Lab.	Tot.
	PP-19	2030422	2+0		2	0	2
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd Semester , 4th year			Prerequisite	2030323		

Course Description:

This course introduces basic concepts of; principles and methods of pharmacy management in all pharmacy practice, fundamentals of human resource management, leadership development, project management, financial accounting, managerial accounting, finance management approaches, skills, styles, organizational principles, behavior and forms, personal, purchasing and inventory control, pricing, professional fees, pharmacy services and patronage, concepts, tools, techniques and application of marketing in the health care and health insurance plan.

Course Outcomes: After completion of the course, the students will be able to:

A. Comprehend basic human resource, financial and operational management knowledge and skills necessary for successful professional practice.

B. Apply the concepts and methods of management, decision making, and leadership in all pharmacy practice

Teaching Strategies:

1. Lectures.
2. Discussion
3. Projects and assignments

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10%	30%	0%	10%	50%

Textbooks:

1. Managing Pharmacy Practice, Principles, Strategies, and Systems, M. Peterson, Publisher; CRC Press. Ed. 1st 2004.
2. Pharmacy Management, Essentials for All Practice Settings, Shane Desselle, David Zgarrick, Publisher; McGraw-Hill Medical, Ed. 2nd 2008.

Reference Books:

1. Marketing for Health Care Organizations, Philip Kotler Clarke, Publisher; Prentice Hall, Ed. 1st 2008.
2. Marketing Management, Philip Kotler, Publisher; Prentice Hall, Ed. 13th 2008.

Pharmacy Management

Course Outcomes and Assessment

Course outcomes	Method of Assessment
A	W, PB, A/P
B	W

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book)

Mapping of the Course Outcomes with the Pharm.D. Program Outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X	X			
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.					
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice	X	X	X		
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Pharm.D. Seminar			حلقة نقاش			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 3/ week	Lec.	Lab.	Tot.
	PP-20	2030423	0+1		0	3	3
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd semester, 4th year.			Prerequisite	2030325		

Course Description:

This course will prepare students for presentation in the journal club as well as for other assigned topics from didactics, and train the students for effective scientific presentation and scientific communication through response to the questions. the course will include ; introduction to scientific peer reviewed journal, critical steps in the selection of the research article, discussion on the topic, ,material methods, result, conclusion, and student comment. the use of multimedia, slides, overheads, handouts and other visual aids, as well as methods of answering questions from the audience, will also be discussed in this course.

Presentation:

Every student will select, or will be assigned, a relevant topic to pharmacy practice and present it to cover the scope of topic, followed by discussion and answering questions.

Course Outcomes:

After completion of the course the student will be able to:

A- Present the assigned topic using multimedia/ power-point at student-faculty forum, and logically respond to questions from the audiences.

B- Present selected/assigned article in Journal Club meetings and actively participate in discussion

Teaching Strategies:

1. Lectures.
2. Small Group discussion.
3. Experiential learning.

Grading Plan	Assignment/presentations	Mid Term Presentation	Final exam
	20 %	30%	50%

Textbooks:

1. How to Run Seminars and Workshops: Presentation Skills for Consultants Trainers and Teachers, Robert Jolles, Publisher; Wiley, Ed. 3rd 2005.
2. Epidemiology: Study Design and Data Analysis, M. Woodward, Publisher; Chapman & Hall, Ed. 1st 1999.
3. http://ajcc.aacnjournals.org/site/misc/journalclubwebpage.pdf

Reference Book :

1. Publishing and Presenting Clinical Research, Warren S. Browner, Publisher; Lippincott Williams & Wilkins, Ed. 1st 1999.

Pharm.D. Seminar

Course outcomes and Assessment:

Course outcome	Method of Assessment
A	A/P
B	A/P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.					
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.	X				
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.	X	X			
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences	X	X			

Course Name	Self Care and Non Prescription Drugs			العناية الذاتية والأدوية اللاوصفية			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 2/ week	Lec.	Lab.	Tot.
	PP-21	2030424	2+0		2	0	2
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd Semester, 4th year			Prerequisite	2010312		

Course Description:

Lectures: Use of evidence-based approach to establish the safety and effectiveness of self-care options for particular disorders and the pharmacist's role in self-medication. Home diagnostic devices. A study of products used by the self–medicating public, including material on the symptoms for which patients seek self-treatment, evaluation and selection of products used to treat them, aspects of patient counseling on the safe and effective use of products and various legal considerations relating to this class of drugs.

Course Outcomes:

After completion of the course the student should be able to:

A. Select the rational drugs for common diseases and advise self medication in clinical practice.
B Comprehend social and economic value of self-medication .
C. Distinguish between prescription and non-prescription medicines.
D. Provide detailed information and instructions for self medication and use of non-prescription drugs.

Teaching Strategies;

1. Interactive lectures
2. Discussions
3. Assignments and projects

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	30%	0%	10%	50%

Textbooks:

1. Handbook of Non-prescription Drugs, Rosemary R. Berardi, Publisher; APhA Publications. Ed. 15th 2006.
2. Non Prescription Drugs Therapy: Guiding Patient Self Care, Trimothy R. Covinyton, Publisher; Facts and Comparisons, Ed. 3rd 2004.

Reference Books:

1- Non Prescription Products Therapeutics, W. Steven Pray, Publisher; Lippincott Williams &Wilkins, Ed. 2nd 2005.
2- Non Prescription Drugs Medicines, Alan Nathan, Publisher; Pharmaceutical Press, Ed. 4th 2009.
3- Drug Misuse and Community Pharmacy, Sheridan, Strang, Publisher; CRC Press. Ed. 1st 2002.

Self Care and Non Prescription Drugs

Course Outcomes and Assessment

Course outcome	Method of Assessment
A	W
B	W
C	W,A/P
D	W

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the Course Outcomes with the Pharm.D. Program Outcomes

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.					
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.	X	X		X	
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.	X	X		X	
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.	X			X	
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.	X		X	X	
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Pharmacoepidemiology			علم وبائيات الدواء			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 1/ week	Lec.	Lab.	Tot.
	PP-22	2030425	1+0		1	0	1
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	2nd Semester, 4th year.			Prerequisite	2030414		

Course Description: Pharmacoepidemiology and its importance in pharmacy practice, principles of epidemiology applied to the study of drug use evaluation, medication safety pharmacovigilence (use of pharmacoepidemiology to study beneficial drug effects, use of pharmacoepidemiology to study adverse drug effects), continual monitoring for unwanted drug effects (post-marketing surveillance), applications in pharmacy practice, medication adherence, statistics in pharmacopeias, international perspective (global drug surveillance).

Course Outcomes:

After completion of the course the student should be able to:

A. Define pharmacoepidemiology and its scope in pharmacy practice

Comprehend the basic understanding and knowledge of epidemiology in: pharmacovigilence and surveillance studies

Teaching Strategies:

1. Lectures.
2. Discussion.
3. Assignments and projects

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	30%	0%	10%	50%

Textbooks:

1. Understanding Pharmacoepidemiology, Donna West, Yi Yang, Publisher; McGraw-Hill Medical, Ed. 1st 2010.
2. Pharmacoepidemiology, Brian L Strom, Publisher; John Wiley & Sons, Ed. 2nd 2001.

Reference Books:

1. Introduction to Epidemiology, Ray M. Merrill, Thomas C. Timmreck, Publisher; Jones & Bartlett Pub, Ed. 4th 2006.
2. Textbook of Pharmacoepidemiology, Brian L. Strom, Publisher; John Wiley Sons, Ed. 4th 2007.

Pharmacoepidemiology

Course outcomes and Assessment:

Course outcome	Method of Assessment
A	W
B	A/P. P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
9.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.					
10.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.					
11.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
12.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
13.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.	X	X			
14.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
15.	Use basic principles of organizational and management in skills in pharmaceutical services and practice		X			
16.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences		X			

Course Name	Pharmaceutical Biotechnology			علم التكنولوجيا الحيوية الصيدلانية			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 2/ week	Lec	Lab	Tot
	BMS-13	2020421	2 + 0		2	0	2
Track	☐ Pharmaceutical Sciences ■ Biomedical sciences ☐ Pharmacy Practice ■ Elective course ☐ University requirement						
Level	2nd Semester, 4th year			Prerequisite	2020213		

Course Description:

In this course the students will be introduced to pharmaceutical aspects of biotechnology. The topics covered in the course include signal transduction, transcription factors, applied enzymology, introduction to proteomics, gene manipulation and recombinant DNA technology to produce recombinant proteins, various expression systems, introduction to tissue culture, applications of recombinant DNA in the pharmaceutical fields, web resources for biotechnology, formulation of biotech products including biopharmaceutical considerations, gene therapy, DNA vaccines, biotechnology and drug discovery, the pharmacist's role in biotechnology and dispensing biotechnology products.

The students will be given practical assignments in addition to written examinations.

Course Outcomes:

After completion of the course the student will be able to:

A- Interpret various cellular processes and their application in the field of health care.
B- Discuss gene manipulation and its applications in the field of medicine
C- Discuss pharmaceutical aspects of biotechnology
D- Demonstrate skills to perform various biotechnology techniques in an independent setting
E- Collect, organize and interpret information from online resources.

Teaching Strategies:

1. Discussion.
2. Lectures.
3. Assignments (Home and library) and projects

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	30%	0%	10%	50%

Textbooks:

1. Pharmaceutical biotechnology: fundamentals and applications, J. A. Crommelin Daan, Robert D. Sindelar, Bernd Meibohm, Publisher; Informa Healthcare, 3rd Ed., 2007.
2. Pharmaceutical biotechnology: Concepts and applications, Gary Walsh, Publisher; Wiley, 1st Ed. 2007.

Reference Books:

1. Pharmaceutical Biotechnology: Drug Discovery and Clinical Applications, Oliver Kayser , Rainer H. Miller, Publisher; Wiley-VCH, 1st Ed. 2004.
2. Medical Biotechnology, Judit Pongracz, Mary Keen, Publisher; Churchill Livingstone, 1st Ed. 2009.
3. Glossary of biotechnology terms, Kimbal Nill, Publisher;CRC Press, 4th Ed. 2005.

Pharmaceutical Biotechnology

Course outcomes and Assessment:

Course outcome	Method of Assessment
A	**W**
B	**W**
C	**W**
D	**PB**
E	**A/P**

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	**B**	**C**	**D**	**E**
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.	X				
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.	X	X			
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.					
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.		X	X		X
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.		X	X	X	X
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Course Name	Pharmacogenomics			علم الادوية الجينومي			
Course Information	Course Code	Course No	Credit Hours	Contact Hours 2/ week	Lec.	Lab.	Tot.
	PP-23	2030426	2 + 0		2	0	2
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ■ Elective course ☐ University requirement						
Level	2nd Semester, 4th year.			Prerequisite	2020213		

Course Description:

Lecture: This course is designed to introduce the students to role of genetics in drug responses. The genetic basis of variability in drug response can contribute to drug efficacy and toxicity, adverse drug reactions and drug-drug interactions The students will learn about genomic variation among humans, web resources for bioinformatics, applications of genomics in human health and complex disease, pharmacogenomics of drug metabolizing enzymes, pharmacogenomics of drug transporting proteins and drug receptors, pharmaco-genetics of drug metabolism and its clinical applications, pharmacogenomics of drug interactions and their adverse effects, cancer pharmacogenomics and pharmacogenomics in drug discovery and drug development..

Course Outcomes:

Upon successful completion of the course the student should be able to

A. Explain the basic principles of human genetics and polymorphic variability including the use of online resources
B. Discuss how genetic variability in genes, encoding drug metabolizing enzymes, drug transporting proteins, and drug receptors (target) contribute to pharmacokinetic and pharmacodynamic processes
C. Apply pharmacogenomics concepts to a particular drug therapy to solve relevant problems in pharmaceutical care.
D. Critically evaluate the current pharmacogenomic literature.

Teaching Strategies:

1. Lectures.
2. Discussion.
3. Assignments (home and library)and projects

Grading Plan	Quizzes	Midterm	Practical	Assignments/projects	Final Exam
	10 %	30 %	0%	10%	50%

Textbooks:

1. Pharmacogenomics, Werner Kalow, Meyer, Rachel F. Tyndal, Publisher; Informa Healthcare, Ed. 2nd 2005.
2. Pharmacogenomics: Applications to Patient Care. Publisher; American College of Clinical Pharmacy. Ed.1st 2004

References Book:

1. Pharmacogenomics in Drug Discovery and Development (Methods in Molecular Biology)m Publisher; Qing Yan Humana Press, Ed. 1st 2008

Pharmacogenomics

Course outcomes and Assessment:

Course outcome	Method of Assessment
A	W. A/P
B	W
C	W.A/P
D	A/P

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm.D. program outcomes:

Sr. No	Program outcomes (Pharm.D.)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.					
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.	X	X			
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.					
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.			X		
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.				X	
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice					
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences					

Courses' Description

7.5 Fifth Year

APPE

Advanced Pharmacy Practice Experience (APPE)

Course Name	Advanced Pharmacy Practice Experience-1,2,3			خبرة ممارسة الصيدلة الإكلينيكية المتقدمة			
Course Information	Course Code	Course No	Credit Hours	Contact Hours	Lec.	Pract	Tot.
	PP.24, 25,26	2030431, 2030511,2030521	5+15+15	Minimum 40 hours/week	0	35	
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	Summer, fall and spring semester			Prerequisite	Must pass all the courses		

Training Description:

During the Advanced Pharmacy Practice Experience (APPE), the student will be involved in the provision of advanced clinical pharmacy services in various medical sub-specialty environments. The student will have experience in the responsibilities (under direct supervision of preceptor) of:

- **Professional communication and collaboration** with patients and health care providers, while working in **institutional** pharmacies as well as in the clinical departments
- **Patient care** including therapeutic decision making by selecting appropriate drug therapy and monitoring that therapy. Students will be actively involved in the areas of: management of disease state, medication therapy management, patient monitoring, care-planning and follow up, patient chart review, including the patients lab data, medication history, drug information and discharge medication counseling, in an interprofessional environment
- **Organizational and Professional** skills required to work in the community as well as in the institutional pharmacy set up.

Training Outcomes/Goals

Specific objectives of each rotation are mentioned in the following pages. The following are the general goals and objectives of the clinical clerkship (Advance Clinical Pharmacy Practice Experience):

At the end of forty weeks' APPE the student will be able to:

A. Demonstrate a sufficient, relevant, and expanded knowledge base to utilize appropriate resources necessary to provide patient centered care in various clinical settings in an interprofessional environment.

B. Demonstrate clinical skills necessary to assume accountability and responsibility for therapeutic planning, intervention and outcome evaluations in the process of providing patient centered care as a team member of health care providers (such as physicians, nurses and hospital pharmacists).

C. Demonstrate **professionalism and interpersonal skills** required as team member of interprofessional health care providers for optimum patient centered care

Training Strategies and Activities:

1. Group Activities: attending ward rounds as member of Interprofessional Team of physicians and nurses, bed side discussions about medications followed by presentations.
2. Assignments, Projects and Presentations
3. Patient centered activities: counseling of patients regarding medication, and discharge medication counseling
4. Case-Assisted Student Centered Learning (CASCL)
5. Hands on training in Institutional as well as community pharmacies
6. Journal club & And literature review regarding medications for various disease states, based on evidence

Areas of Rotations	Duration
a. **Mandatory Rotations**: 24 Weeks **1.**Hospital Pharmacy (in & out patient) **2.**Community Pharmacy, 3. Ambulatory Care 4. Internal Medicine 5. Pediatrics 6. Critical Care ,	4 weeks each
b. Elective Rotations: 16 weeks: *Student has to select any 4 from the following* 1. Cardiology & CCU, 2. Nephrology, 3. Oncology/Hematology, 4. Infectious Diseases 5. Psychiatry, 6.Surgery	**4 weeks each**

Grading Plan	Clinical Preceptors evaluation: Pass/No pass

Reference Books:

1. ACCP's Clinical Faculty Survival Guide : Editor(s): Thomas D. Zlatic, Ph.D. ISBN: 978-1-932658-73-6 2010
2. Taking The Clinical History. William Demyer . Oxford University Press, USA. Ed. 1st 2009
3- Boh's Pharmacy Practice Manual: A Guide to the Clinical Experience. Susan M. Stein. Lippincott Williams & Wilkins. Ed. 3rd 2009
4- Pharmacotherapy Casebook, A Patient Focused Approach. Terry L. McGraw-Hill. Ed. 3rd 2007.
5- Pharmacotherapy: A Pathophysiologic Approach. Joseph T. Dipiro, Robert L. Talbert, and Michael Posey,McGraw-Hill Medical.Ed. 6th 2007
6- Applied Therapeutics: The Clinical Use of Drugs. Mary A. Koda, Lloyd Wayne and Joseph Guglielmo. Lippincott Williams & Wilkins. Ed. 9th 2009
7- Pharmacotherapy Casebook, A Patient Focused Approach. Terry L. McGraw-Hill. Ed. 7th 2005
8- Remington: The Science and Practice of Pharmacy. University of the Sciences in Philadelphia. Lippincott Williams & Wilkins. Ed. 21st 2005.
9-

Advanced Pharmacy Practice Experience

Course outcomes and Assessment:

Course outcome	Method of Assessment
A	PB.A/P.P
B	PB.A/P.P
C	PB.A/P.P
D	
E	

W: Written PB: Performance Based A/P: Assignment/Project
P: Portfolio (maintenance of Practical journal/Pharmaceutical Care History Book

Mapping of the course outcome with the Pharm D program outcomes:

Sr. No	Program outcomes (Pharm D)	Course outcomes				
		A	B	C	D	E
1.	Use fundamental scientific knowledge and principles as basis of Pharmaceutical and Clinical Sciences.					
2.	Apply knowledge of biomedical sciences for understanding of disease process and its diagnosis.	X	X	X		
3.	Develop patient data base from patient interview, review hospital record and communication with other health professionals.	X	X	X		
4.	Apply knowledge of clinical Sciences in designing patient specific therapeutic plan based on best evidence and counseling the patient regarding it.	X	X	X		
5.	Evaluate drug information retrieved from pharmaceutical and biomedical science recourses and report for application to specific patient care situation.	X	X	X		
6.	Apply knowledge of basic principles of drug development, formulation and bioequivalence studies in practice and research.					
7.	Use basic principles of organizational and management in skills in pharmaceutical services and practice	X	X	X		
8.	Apply basic principles to design, implement and conduct research studies in different fields of pharmacy practice and Pharmaceutical Sciences		X			

7.5.2 APPE Rotation Description

Course Name	APPE-1 Internal Medicine			الطب الباطني			
Course Information	Course Code	Course No	Credit Hours	Contact Hours Minimum 40 hours/week	Lec.	Pract	Tot.
	PP-21/M	2030511					
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences. ■ Pharmacy Practice. ☐ Elective courses ☐ . University requirements						
Level	Summer, fall and spring semester			Prerequisite	Must pass all the courses		

Description:

This rotation will prepare the student with knowledge base and problem solving skills relating to the management of patients with pharmaceutical care perspective

Rotation Outcomes

Upon completion of this rotation, students should be able to:

A. Prepare treatment plan based upon pathophysiology, clinical presentation, diagnosis,
B. Provide appropriate monitoring parameters for the chosen treatment plan (including efficacy, toxicity, side effects, and potential drug interactions
C. Effectively communicate the drug treatment plan to the patient with the appropriate precautions and expectations.
D. Effectively communicate therapeutic interventions to other members of the health care team.
E. Provide adequate documentation and literature support for therapeutic recommendations.
F. Demonstrate Attitude and skills to work in an Interprofessional environment

Teaching Strategies:

Multi-Media PPT Presentation **,** Problem Based Learning PBL, Case-Assisted Student Centered Learning (CASCL), Ward round with Interprofessional Team of health Care providers, Use of simulations, Small group tutorials, Assignments , Small research projects, Journal club.

Grading Plan	Clinical Preceptors evaluation: Pass/ Fail

Textbooks:

1. Pharmacotherapy: A Pathophysiologic Approach, Joseph T. Dipiro, Robert L. Talbert, Michael Posey, Publisher; McGraw-Hill, Ed. 6th 2006.
2. Pharmacy Clerkship Manual, Ruth & Karen Publisher; McGraw-Hill, Ed. Ist 2002
3. Pharmacy Practice Clinical Manual, Boh L, Publisher; Lippincott, Ed. 2nd 2002.
4. Manual for Clinical Clerkship, College of Clinical Pharmacy, King Faisal University, Al-Ahsa

Reference Book:

1. Textbook of Therapeutics: Drug and Disease Management, E.T. Herfindal, D.R. Gourley, Publisher; Lippincott Williams and Wilkin

Course Name	APPE-2 Institutional Pharmacy Practice Experience			التدريب على الممارسة الصيدلة السريرية المؤسسية			
Course Information	Course Code	Course No	Credit Hours	Contact Hours Minimum 40 hours/week	Lec.	Pract	Tot.
	PP-21/IP	2030511				160	4 weeks
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy practice ☐ Elective course ☐ University requirement						
Level	Summer, fall and spring semester			Prerequisite	Must pass all the courses		

Description:

This rotation will expose students to the practice of institutional pharmacy, to provide the opportunity to explore the health care team approach to patient care, the role of pharmacists in professional decision making, and how the pharmacist and staff supports the well-being of the patient

Rotation Outcomes (Latest Editions)::

At the end of Institutional Pharmacy Rotation, the student shall be able to:

A. Understand the organization and operation of the pharmacy department and its role in patient care.
B. Define and describe the role and function of members within the pharmacy department
C. Understand and demonstrate medication administration in the institutional setting
D. Demonstrate and understand: Sterile products compounding
E. Understand and comprehend Clinical Services provided by the Institutional Pharmacy like Medication monitoring, Dosing, Therapeutic recommendations, Medication Reconciliation, Patient education and discharge counseling, Medication Error reporting and Role Of The Pharmacy And Therapeutics (P&T)Committee and other professional committees .

Teaching Strategies:

Multi-Media PPT Presentation **,** Problem Based Learning PBL, Case-Assisted Student Centered Learning (CASCL), Ward round with Interprofessional Team of health Care providers, Use of simulations, Small group tutorials, Assignments , Small research projects, Journal club.

Grading Plan	Clinical Preceptors evaluation: Pass/ Fail

Textbooks:

1. Manual for Clinical Clerkship, College of Clinical Pharmacy, King Faisal University, Al-Ahsa
2. Handbook of Institutional Pharmacy Practice 4th edition by Thomas R. Brown
3. 2. Hospital Pharmacy by Martin Stephen
4. Pharmacy Clerkship Manual by Ruth & Karen. McGraw-Hill, New York, NY, 2002
5. Boh L, ed. Pharmacy Practice Clinical Manual, 2ed. Lippincott, 2002.
6. Robert J. Cipolle, Peter C. Morley: Pharmaceutical Care Practice: The Clinician Guide
7. Materials as assigned by preceptor or participating health care professionals

Course Name	APPE-3: Ambulatory Care			الرعاية الاسعافية			
Course Information	**Course Code**	**Course No**	**Credit Hours**	**Contact Hours** Minimum 40 hours/week	**Lec.**	**Pract**	**Tot.**
	PP-21/AC	**2030511**				**160**	4 weeks
Track	☐ **Pharmaceutical Sciences** ☐ **Biomedical sciences** ■ **Pharmacy Practice** ☐ **Elective course** ☐ **University requirement**						
Level	**Summer, fall and spring semester**			**Prerequisite**	Must pass all the courses		

Description:

This rotation will prepare the student with knowledge and skills for solving patients' problem relating to the therapeutic management of common disease states in an ambulatory pharmaceutical care setting. Student will work as full time trainee in the Pharmaceutical Care Clinic of a hospital providing patient counseling, pharmaceutical care and drug therapy monitoring to out patients.

Rotation Outcomes

AT the end of the rotation, the student will be able to:

A. Appreciate common medications used in primary care.
B. Understand the common diseases encountered in primary care.
C. Understand the use of drug information resources.
D. Retrieve and document a complete patient database.
E. Taking history & Perform appropriate patient assessment techniques.
F. Educate/counsel the patient regarding his Drug therapy and communicate effectively communicator on the health care team.
G. Plan, implement and monitor the outcomes of drug therapies for common diseases..

Teaching Strategies:

Multi-Media PPT Presentation **,** Problem Based Learning PBL, Case-Assisted Student Centered Learning (CASCL), Ward round with Interprofessional Team of health Care providers, Use of simulations, Small group tutorials, Assignments , Small research projects, Journal club.

Grading Plan	**Clinical Preceptors evaluation: Pass/ Fail**

Textbooks:

1. Manual for Clinical Clerkship, College of Clinical Pharmacy, King Faisal University, Al-Ahsa
2. Handbook of Institutional Pharmacy Practice 4th edition by Thomas R. Brown
3. 2. Hospital Pharmacy by Martin Stephen
4. Pharmacy Clerkship Manual by Ruth & Karen. McGraw-Hill, New York, NY, 2002
5. Boh L, ed. Pharmacy Practice Clinical Manual, 2ed. Lippincott, 2002.
6. Robert J. Cipolle, Peter C. Morley: Pharmaceutical Care Practice: The Clinician Guide
7. Materials as assigned by preceptor or participating health care professionals

Course Name	APPE-4: Cardiology & CCU			علم أمراض القلب والعناية المركزة لأمراض القلب			
Course Information	Course Code	Course No	Credit Hours	Contact Hours Minimum 40 hours/week	Lec.	Pract	Tot.
	PP-21/CCU	2030511				160	4 weeks
Track	☐ Pharmaceutical Sciences ☐ Biomedical Sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	Summer, fall and spring semester			Prerequisite	Must pass all the courses		

Description

This rotation is to prepare the student with knowledge and skills for solving patients' problem relating to the therapeutic management of patients with cardiovascular problems while working with a team of experts both in ambulatory and ICC environment

Rotation Outcomes:

Upon completion of the rotation, the student shall be able to:

A. Prepare, implement and monitor therapeutic plan for the following cardiovascular diseases, with pharmaceutical care perspective:
   a. Ischemic Heart Disease: Angina and Acute Coronary Syndrome
   b. Essential hypertension, hypertensive urgencies and emergency
   c. Ventricular and atrial arrhythmias
   d. Congestive Heart Failure/Cardiomyopathy
   e. Cardiogenic Shock
   f. Endocarditis
   g. Hyperlipidemia Anticoagulation, Cerebro-vascular diseases

B. Gather and relate to the patient's clinical course, all diagnostic, monitoring, pharmacologic, therapeutic, and surgical interventions employed in those patients with coronary disease.

C. Identify and apply the pharmacological and non pharmacological aspects of cardiopulmonary resuscitation (CPR)

D. Gain competence in understanding the basic concepts of hemodynamic monitoring utilizing data obtained from Swan-Ganz arterial, or central venous catheters and other pertinent information (i.e., arterial blood gases).

Teaching Strategies:

Multi-Media PPT Presentation **,** Problem Based Learning PBL, Case-Assisted Student Centered Learning (CASCL), Ward round with Interprofessional Team of health Care providers, Use of simulations, Small group tutorials, Assignments , Small research projects, Journal club.

Grading Plan	Clinical Preceptors evaluation: Pass/ Fail

Textbooks:

1. Manual for Clinical Clerkship, College of Clinical Pharmacy, King Faisal University, Al-Ahsa
2. Pharmacotherapy, a Pathophysiologic Approach, DiPiro JT, Talbert RL, Yee GC, Matzke GR, Wells BG, Posey LM, eds Latest Ed. McGraw-Hill, New York, NY.
3. Pharmacy Clerkship Manual by Ruth & Karen. McGraw-Hill, New York, NY, 2002
4. Boh L, ed. Pharmacy Practice Clinical Manual, 2ed. Lippincott, 2002.
5. Robert J. Cipolle, Peter C. Morley: Pharmaceutical Care Practice: The Clinician Guide
6. Materials as assigned by preceptor or participating health care professionals

Course Name	APPE-5: Pediatrics			طب الأطفال			
Course Information	Course Code	Course No	Credit Hours	Contact Hours Minimum 40 hours/week	Lec.	Pract	Tot.
	PP-21/P	2030511				160	4 weeks
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	Summer, fall and spring semester			Prerequisite	Must pass all the courses		

Description: This rotation will provide the student the opportunity to develop skills in dealing with pharmaceutical care needs of pediatric population. Student will participate in therapeutic decision making process by selecting appropriate drug therapy and its monitoring, with a patient specific medication counseling to parents and health professionals

Rotation Outcomes

After completion of the rotation, the student shall be able to:

A. Prepare, and apply therapeutic plan for pediatric patients admitted in the hospital, as a part of team of health professional
B. Provide general pediatric drug information, including appropriate pediatric dosing, antibiotic therapy, pain and sedation management, and pharmacokinetic analysis.
C. Monitor patient therapy and progression, in consult with physicians and nurses
D. Effectively hold counseling session for the parents and the care givers regarding the drug therapies.

Teaching Strategies:

Multi-Media PPT Presentation **,** Problem Based Learning PBL, Case-Assisted Student Centered Learning (CASCL), **Ward round with Interprofessional Team of health Care providers**, Use of simulations, Small group tutorials, Assignments , Small research projects, Journal club.

Grading Plan	Clinical Preceptors evaluation: Pass/ Fail

Textbooks:

1. Manual for Clinical Clerkship, College of Clinical Pharmacy, King Faisal University, Al-Ahsa
2. Pharmacotherapy, a Pathophysiologic Approach, DiPiro JT, Talbert RL, Yee GC, Matzke GR, Wells BG, Posey LM, eds Latest Ed. McGraw-Hill, New York, NY.
3. Pharmacy Clerkship Manual by Ruth & Karen. McGraw-Hill, New York, NY, 2002
4. Boh L, ed. Pharmacy Practice Clinical Manual, 2ed. Lippincott, 2002.
5. Robert J. Cipolle, Peter C. Morley: Pharmaceutical Care Practice: The Clinician Guide
6. Materials as assigned by preceptor or participating health care professionals

Course Name	APPE-6: Critical Care			العناية المركزة			
Course Information	Course Code	Course No	Credit Hours	Contact Hours Minimum 40 hours/week	Lec.	Pract	Tot.
	PP-21/CC	2030511				160	4 weeks
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	Summer, fall and spring semester			Prerequisite	Must pass all the courses		

Description: This rotation will provide the student the opportunity to develop skills for dealing with critically ill patients, under the supervision of team of multidisciplinary health care experts in an ICU environment.

Rotation outcomes:

After completion of this rotation, students should be able to

A. Demonstrate knowledge and skill in Critical Care Pharmacology, Fluid electrolyte balance, cardiovascular hemodynamics and ventilator support
B. Perform therapeutic drug monitoring in critically ill patients for: aminoglycosides, vancomycin, phenytoin, digoxin.
C. Communicate at an appropriate level with other health care professionals, including attending physicians, fellows, residents, nursing staff, respiratory therapists, dietitians, as well as other pharmacy colleagues in order to optimize drug therapy
D. Understand of the prevention and treatment of complications in the critically ill patient.
E. Reviewing, monitoring, and optimizing pharmacotherapy of select patients.
F. Tight glycemic control, DVT prophylaxis, stress ulcer prophylaxis, prevention of ventilator associated pneumonia, sepsis, etc.

Teaching Strategies:

Multi-Media PPT Presentation **,** Problem Based Learning PBL, Case-Assisted Student Centered Learning (CASCL), **Ward round with Interprofessional Team of health Care providers**, Use of simulations, Small group tutorials, Assignments , Small research projects, Journal club.

Grading Plan	Clinical Preceptors evaluation: Pass/ Fail

Textbooks:

1. Manual for Clinical Clerkship, College of Clinical Pharmacy, King Faisal University, Al-Ahsa
2. Pharmacotherapy, a Pathophysiologic Approach, DiPiro JT, Talbert RL, Yee GC, Matzke GR, Wells BG, Posey LM, eds Latest Ed. McGraw-Hill, New York, NY.
3. Pharmacy Clerkship Manual by Ruth & Karen. McGraw-Hill, New York, NY, 2002
4. Boh L, ed. Pharmacy Practice Clinical Manual, 2ed. Lippincott, 2002.
5. Robert J. Cipolle, Peter C. Morley: Pharmaceutical Care Practice: The Clinician Guide
6. Materials as assigned by preceptor or participating health care professionals

Course Name	APPE-7: Hematology/Oncology			أمراض الدم والأورام			
Course Information	Course Code	Course No	Credit Hours	Contact Hours Minimum 40 hours/week	Lec.	Pract	Tot.
	PP-21/HC	2030511				160	4 weeks
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences. ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	Summer, fall and spring semester			Prerequisite	Must pass all the courses		

Description: The rotation will provide the student with the opportunity to develop skills in therapeutic management of hematology/oncology patients, including pharmaceutical as well as supportive care

Rotation Outcomes:

After completion of the rotation, the student shall be able to:

A. Develop primary and alternative plan for therapeutic management of the following condition, with a sound knowledge of symptomatology, physical findings, pathophysiology, diagnostic procedures, laboratory tests .for patients of Leukemias ,Lymphomas, Breast, lung, gastric and colon cancers
B. Familiar with the role of diagnostic, palliative, and curative radiation therapy and surgery in cancer management including the monitoring and management of the associated complications.
C. Establish therapeutic and toxic endpoints of therapy.
D. Develop plan for supportive-terminal (hospice) care and pain control for these patients**.**

Teaching Strategies:

Multi-Media PPT Presentation **,** Problem Based Learning PBL, Case-Assisted Student Centered Learning (CASCL), Ward round with Interprofessional Team of health Care providers, Use of simulations, Small group tutorials, Assignments , Small research projects, Journal club.

Grading Plan	Clinical Preceptors evaluation: Pass/ Fail

Textbooks:

1. Manual for Clinical Clerkship, College of Clinical Pharmacy, King Faisal University, Al-Ahsa
2. Pharmacotherapy, a Pathophysiologic Approach, DiPiro JT, Talbert RL, Yee GC, Matzke GR, Wells BG, Posey LM, eds Latest Ed. McGraw-Hill, New York, NY.
3. Pharmacy Clerkship Manual by Ruth & Karen. McGraw-Hill, New York, NY, 2002
4. Boh L, ed. Pharmacy Practice Clinical Manual, 2ed. Lippincott, 2002.
5. Robert J. Cipolle, Peter C. Morley: Pharmaceutical Care Practice: The Clinician Guide
6. Materials as assigned by preceptor or participating health care professionals

Course Name	APPE-8:Nephrology			أمراض الكلى			
Course Information	Course Code	Course No	Credit Hours	Contact Hours Minimum 40 hours/week	Lec.	Pract	Tot.
	PP-21/N	2030511					4 weeks
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	Summer, fall and spring semester			Prerequisite	Must pass all the courses		

Description:

This rotation will provide the student with an opportunity to develop his/her skills in management of Acute and Chronic Renal Failure, being an active member of team of health professionals, taking part in therapeutic decision making, its application and monitoring.

Rotation Outcomes:

After completion of the rotation, the student shall be able to:

A. Develop management plan under supervision of nephrologist for acute and chronic failure based upon etiology clinical presentation, pharmacodynamic and pharmacokinetic parameters, and medical history of the patient
B. Demonstrate the application of the principles of renal replacement therapy.
C. Communicate the treatment plan with patient.
D. Monitor drug dosing, adverse events, drug interactions, and efficacy of all medications affecting the renal system and recommend changes in drug therapy when appropriate.

Teaching Strategies:

Multi-Media PPT Presentation **,** Problem Based Learning PBL, Case-Assisted Student Centered Learning (CASCL), Ward round with Interprofessional Team of health Care providers, Use of simulations, Small group tutorials, Assignments , Small research projects, Journal club.

Grading Plan	Clinical Preceptors evaluation: Pass/ Fail

Textbooks:

1. Manual for Clinical Clerkship, College of Clinical Pharmacy, King Faisal University, Al-Ahsa
2. Pharmacotherapy, a Pathophysiologic Approach, DiPiro JT, Talbert RL, Yee GC, Matzke GR, Wells BG, Posey LM, eds Latest Ed. McGraw-Hill, New York, NY.
3. Pharmacy Clerkship Manual by Ruth & Karen. McGraw-Hill, New York, NY, 2002
4. Boh L, ed. Pharmacy Practice Clinical Manual, 2ed. Lippincott, 2002.
5. Robert J. Cipolle, Peter C. Morley: Pharmaceutical Care Practice: The Clinician Guide
6. Materials as assigned by preceptor or participating health care professionals

Course Name	APPE-9: Infectious Diseases			الأمراض المعدية			
Course Information	Course Code	Course No	Credit Hours	Contact Hours Minimum 40 hours/ week	Lec.	Pract.	Tot.
	PP-21/ID	2030511				160	4 weeks
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	Summer, fall and spring semester			Prerequisite	Must pass all the courses		

Description:

This rotation will provide an opportunity to the student to equip with a knowledge base and problem solving skills relating to the treatment of infectious diseases with a pharmaceutical care perspective. Student will work with experts team of health professionals in this area and also in an antimicrobial management program.

Rotation Outcomes:

After completion of the rotation, the student shall be able to:

A. Plan for therapeutic management of common and serious infectious diseases with demonstration of strong knowledge base in the area of, symptomatology, physical findings, pathophysiology, diagnostic procedures, and laboratory tests.
B. Demonstrate a working knowledge of the spectrum of activity, pharmacokinetic principles, tissue penetration, development of resistance and cost effectiveness of antimicrobial agents
C. Define appropriate utilization and understanding of laboratory tests specific to infectious diseases.

Teaching Strategies:

Multi-Media PPT Presentation **,** Problem Based Learning PBL, Case-Assisted Student Centered Learning (CASCL), Ward round with Interprofessional Team of health Care providers, Use of simulations, Small group tutorials, Assignments , Small research projects, Journal club.

Grading Plan	Clinical Preceptors evaluation: Pass/ Fail

Textbooks:

1. Manual for Clinical Clerkship, College of Clinical Pharmacy, King Faisal University, Al-Ahsa
2. Pharmacotherapy, a Pathophysiologic Approach, DiPiro JT, Talbert RL, Yee GC, Matzke GR, Wells BG, Posey LM, eds Latest Ed. McGraw-Hill, New York, NY.
3. Pharmacy Clerkship Manual by Ruth & Karen. McGraw-Hill, New York, NY, 2002
4. Boh L, ed. Pharmacy Practice Clinical Manual, 2ed. Lippincott, 2002.
5. Robert J. Cipolle, Peter C. Morley: Pharmaceutical Care Practice: The Clinician Guide
6. Materials as assigned by preceptor or participating health care professionals

Course Name	APPE-10 Emergency Medicine			طب الطوارئ			
Course Information	Course Code	Course No	Credit Hours	Contact Hours Minimum 40 hours/week	Lec.	Pract	Tot.
	PP-21/EM	2030511				160	4 weeks
Track	☐ Pharmaceutical Sciences ☐ Biomedical sciences ■ Pharmacy Practice ☐ Elective course ☐ University requirement						
Level	Summer, fall and spring semester			Prerequisite	Must pass all the courses		

Description:

This rotation will provide the student with a knowledge base and problem solving skills relating to the provision of emergency medical care by exposing him to an experience with the EMS System, with a team of health care professionals

Rotation Outcomes:

Upon completion of the rotation, the student shall be able to:

A. Ensure the delivery of the right medication to right patient and ensure the most appropriate therapy is chosen and administered.
B. Assess medication errors, drug interactions and adverse drug reactions as causes of ED admissions.
C. Conduct history of patients and family members when appropriate.
D. Participate in the physical exam and assess the patient's diagnosis for the most appropriate treatment protocol
E. Make therapeutic recommendations in an ED setting based upon evidence based medicine.
F. Identify and apply the pharmacological and non pharmacological aspects of cardiopulmonary resuscitation (CPR) and will participate in all such events. The student will be able to locate the various drugs and other ancillary items (i.e., ABG kits, IV bags, laryngoscope) in the Crash Cart and be able to discuss drug therapy used in CPR/ACLS.

Teaching Strategies:

Multi-Media PPT Presentation , Problem Based Learning PBL, Case-Assisted Student Centered Learning (CASCL), Ward round with Interprofessional Team of health Care providers, Use of simulations, Small group tutorials, Assignments , Small research projects, Journal club.

Grading Plan	Clinical Preceptors evaluation: Pass/ Fail

Textbooks:

1. Manual for Clinical Clerkship, College of Clinical Pharmacy, King Faisal University, Al-Ahsa
2. Pharmacotherapy, a Pathophysiologic Approach, DiPiro JT, Talbert RL, Yee GC, Matzke GR, Wells BG, Posey LM, eds Latest Ed. McGraw-Hill, New York, NY.
3. Pharmacy Clerkship Manual by Ruth & Karen. McGraw-Hill, New York, NY, 2002
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5. Robert J. Cipolle, Peter C. Morley: Pharmaceutical Care Practice: The Clinician Guide
6. Materials as assigned by preceptor or participating health care professionals

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