KING KHALID UNIVERSITY
كلية الصيدلة
College of Pharmacy

College of Pharmacy

PharmD Program Handbook

v 2023

Pharmacy.kku.edu.sa

@Kkupharmacy

Table of Contents

King Khalid University

On Tuesday 09/01/1419 AH (06/05/1998), HRH Crown Prince ordered the merger of Imam Mohammad Ibn Saud Islamic University and King Saud University in the Southern Region into one entity under the new identity of 'King Khalid University'. Later, on 11/3/1419 AH (6/7/1998 AD), a Royal Decree, Decree 7/78/M, was issued to complete all regular procedures necessary to effect the merger. The University's first budget was allocated within the general state budget on 14/09/1419 AH (02/01/1999 AD).

The University is in the Aseer region in southwestern Saudi Arabia. The area of the Aseer region is about 80.000 square kilometers, with more than 2.300.000 people distributed in seventy-eight governorates and centers.

Vision

To be a world-leading university in developing the human, the place and enhancing the economy.

Mission

To have an academic environment stimulating the production and application of knowledge, research and innovation, promoting social responsibility and contributing to sustainable development by optimizing our capabilities and resources.

Goals

- To Improve teaching and learning outputs in order to meet labor market requirements and ensure sustainable development.
- To conduct scientific research to promote innovations and contribute to the knowledge economy.
- To promote social responsibility and voluntary work
- To improve the quality of university life
- To achieve institutional excellence
- To diversify, develop and sustain revenue sources.

College of Pharmacy

About the college

The College of Pharmacy (COP) is a part of the University's Health Colleges System. Other health colleges in the system include the Colleges of Medicine, Dentistry, and Applied Medical Sciences (at Abha and Khamis Mushait). The COP at KKU was established in 2001 in Abha. The College has five departments: Pharmaceutical Chemistry, Pharmacognosy, Pharmaceutics, Pharmacology, and Clinical Pharmacy. KKU began offering the Doctor of Pharmacy (PharmD) program in 2010. The PharmD program is delivered in English for six years, in terms of the training students undertake for one year. The PharmD program trains students in pharmaceutical sciences, after which the graduates will have the necessary experience to move into a related science field or work in various pharmacy fields, such as hospital or community pharmacies, pharmaceutical companies, or marketing. The PharmD program is a professional-level degree covering pharmaceutical sciences, focusing on the clinical aspects that will allow graduates to work in hospitals with the medical team. The pharmacy training periods, known as Advanced Pharmacy Practice Experiences (APPEs), have been designed to provide students with various experiences in clinical pharmacy areas, including hospitals/institutions, community pharmacies, ambulatory care, or acute care/internal medicine.

Vision

To accomplish national and international recognition for excellence and innovation in pharmacy education, scientific research, and community service.

Mission

Graduating pharmacists capable of playing an effective and efficient role within the health care professional team to serve the community through direct patient care, scientific research and community engagement.

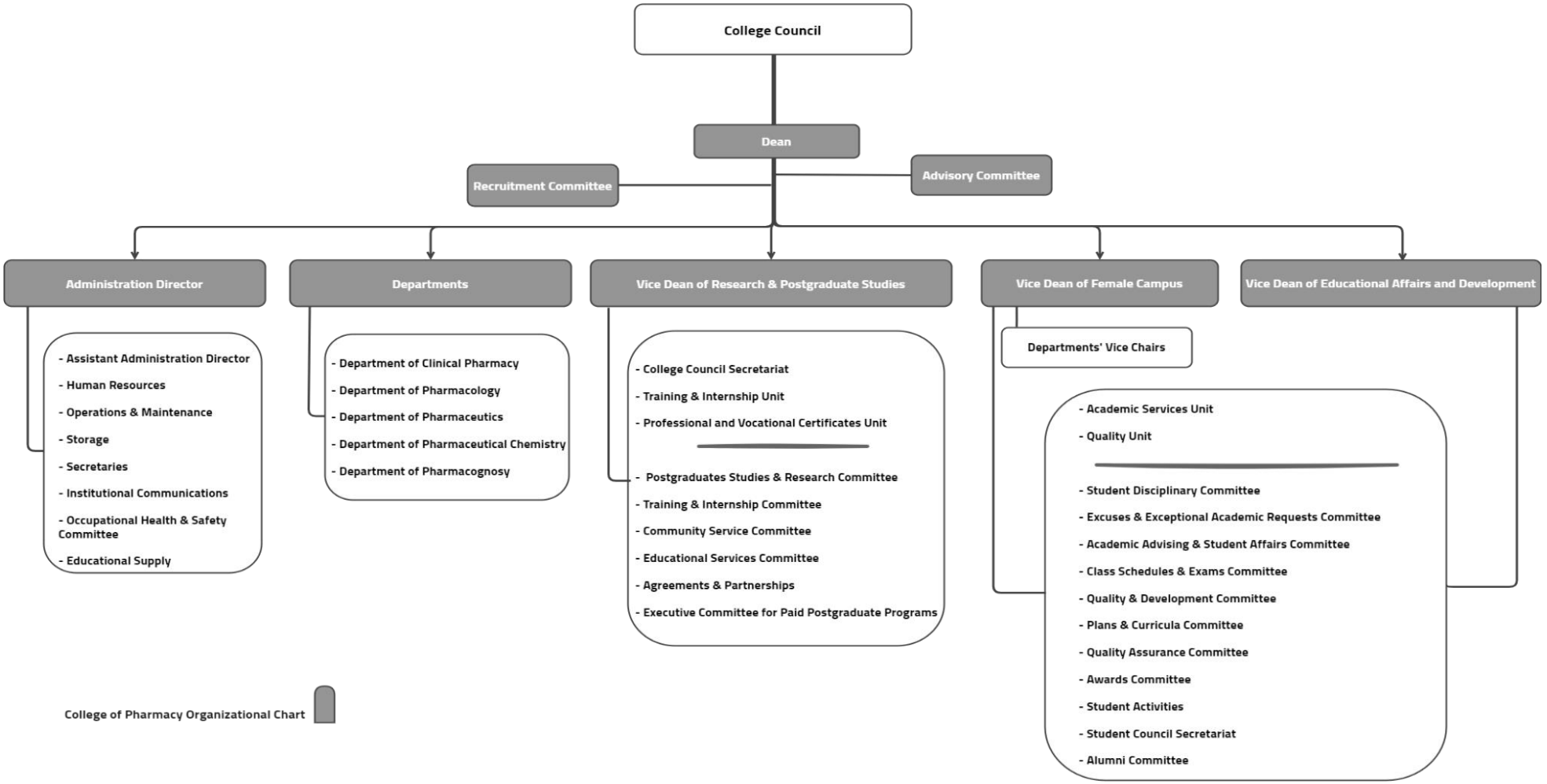
Goals

1. Improve the quality of pharmacy education and practice.
2. Recruit, develop, and retain distinguished faculty members to improve education and research.
3. Promote educational environment and cooperation among pharmacy and other health care disciplines.
4. Accommodate with the organization administrational processes and measures to provide support to the academic programs.
5. Encourage high impact scientific research, postgraduate education, and enrich resources.
6. Provide high quality continuous pharmacy education and excellent pharmaceutical services to the community.

Major values

Honesty, commitment, respect, excellence, innovation, and transparency.

Organization Chart



College of Pharmacy Organizational Chart

Pharm. D Program

The Pharm. D program at the College of Pharmacy, King Khalid University, is designed to provide a distinctive undergraduate program for clinical and pharmacy practices and to graduate professional pharmacists who can work as drug therapy experts. The Pharm. D curriculum is structured around an integrated approach to drug therapy management. The study plan includes a six-year degree program that provides a combined academic and clinical experience for pharmacy students. It combines courses in basic and advanced pharmaceutical sciences. The academic year consists of two regular semesters, each lasting 15 weeks. These are followed by two to three weeks of an examination period. The number of class hours each week is approximately 28 hours. The study plan provides students with a strong foundation in pharmaceutical biomedical sciences, clinical sciences, and the social, behavioral, and administrative aspects of pharmacy practice. The first three professional years of the program focus on foundational courses in biomedical, pharmaceutical chemistry, pharmacology, and pharmaceutic sciences. The program also includes introductory (IPPE) and advanced (APPE) pharmacy practice experiences primarily in government and private hospitals in the Aseer region.

Pharm. D Program Mission

Provide a professional education that prepares students with competencies and skills to practice effectively in a wide variety of existing and future roles in patient-centered care, research and community services.

Pharm. D Program Goals

- Graduate medication therapy experts with knowledge, skills and values to meet health care and professional market requirements.
- Provide competent students in pharmacy profession capable of effectively participating in foundational scientific research in the fields of pharmacy practice and pharmaceutical sciences.
- Foster values and skills of the graduates that promote collaborations with other health care providers to enhance community services and public health awareness.

Pharm. D Program Learning Outcomes

Knowledge and Understanding	
K1	Recall the scientific knowledge derived from pharmaceutical sciences including natural and synthetic drugs, pharmacodynamics pharmacokinetic profile, drug formulation and delivery and other disciplines.
K2	Define scientific information related to biomedical sciences including functions of human body, biological, genetics, biotechnological, microbiological, and other aspects.
K3	Recognize the basic principles of pharmacy practice involving therapeutics, evidence-based pharmaceutical care, pharmacy management, pharmacoeconomics, pharmacepidemiology, and other areas.
K4	Recall necessary foundational knowledge of research and administrative skills required in pharmacy profession.
Skills	
S1	Implement knowledge from the foundational sciences to become a medication therapy expert.
S2	Apply the knowledge derived from different pharmaceutical areas in conducting research studies in the fields of pharmacy practice and pharmaceutical sciences.
S3	Utilize evidence-based drug information retrieved from authentic resources to fulfill an appropriate patient- centered treatment plan.
S4	Demonstrate effective verbal and written communication and counseling skills when interacting with patients, healthcare professionals and the public.
S5	Interpret information obtained from various pharmacy-related resources regarding drug dosing, clinical pharmacokinetic parameters, and statistical data relevant to pharmacy practice and research.
S6	Contribute to decision making process by constructing patient-centered evidence-based pharmaceutical care plan and medical recommendations.
Values	
V1	Show responsibility and accountability through advocating patients' right to safe and effective medication use.
V2	Demonstrate leadership abilities through professionalism, self- and time-management, and team work skills that help resolving challenges in the pharmacy profession.

V3	Demonstrate high level of professional and ethical behavior with mutual respect towards patients and other healthcare professionals.
V4	Participate actively in enhancing the health care profession and general public awareness.
V5	Illustrate life-long learning in the field of pharmaceutics, biomedical sciences and pharmacy practice.

Pharm.D Program Graduate Attributes

- **Knowledge:** Implement in-depth professional knowledge from foundational, pharmaceutical sciences, and pharmacy practice to become a medication therapy expert.
- **Ethics:** Exhibit professional and ethical responsibilities towards patients and other healthcare professionals in the context of social and cultural norms.
- **Problem Solving:** Interpret evidence-based information retrieved from scientific literature to provide patient-centered care.
- **Cooperation:** Demonstrate self-responsibility, effective communication skills within a team environment, and leadership.
- **Information Technology (IT) skills:** Utilize IT and numerical skills relevant to pharmacy practice for optimizing patient- centered treatment plans and lifelong learning.
- **Research Skills:** Apply scientific research skills in the development of health care and community service.

Pharm.D Program Admission

• The applicant must be a Saudi national or born to a Saudi mother.

• To be eligible, the applicant must hold a high school diploma or its equivalent from within or outside the Kingdom.

• Admission to health specialties requires that the student be a graduate of the same year only.

• To be eligible for admission to a chosen specialty, students must meet the medical requirements. If a student is found medically unfit, the admission and registration deanship can either change their acceptance to a suitable specialty or revoke their admission.

• The applicant must not be academically or disciplinarily dismissed from KKU or any other Saudi universities.

• Upon completion of the first year, students' admission undergoes a reevaluation process. The Pharm.D program specifically mandates a competitive cumulative GPA of 3.75 out of 5 as a prerequisite for continuation.

Pharm. D Program Outline

University and Medical College Requirements

University Requirements	12 Credit Hours
Medical College Requirements	20 Credit Hours
Total	**32** Credit Hours

University Requirements

Course Code	Course Title	Credit Hours
ICI - 111	The Entrance to the Islamic Culture	2
ICI - 112	Islamic Culture II	2
ICI - 113	Islamic Culture III	2
ICI - 114	Islamic Culture IV	2
ARAB - 201	Arabic Language Skills	2
ARAB - 202	Arabic Editing	2
Total		**12**

Medical College Requirements

Course Code	Course Title	Credit Hours
ENG - 019	Intensive English Program	6
PHYS - 102	Physics for Health Sciences	4
ZOOL - 105	Zoology for Health Sciences	4
CHEM - 110	General Chemistry for Health Sciences	2
CHEM - 111	Organic Chemistry for Health Sciences	3
COMM - 141	Basic Biostatistics	1
Total		**20**

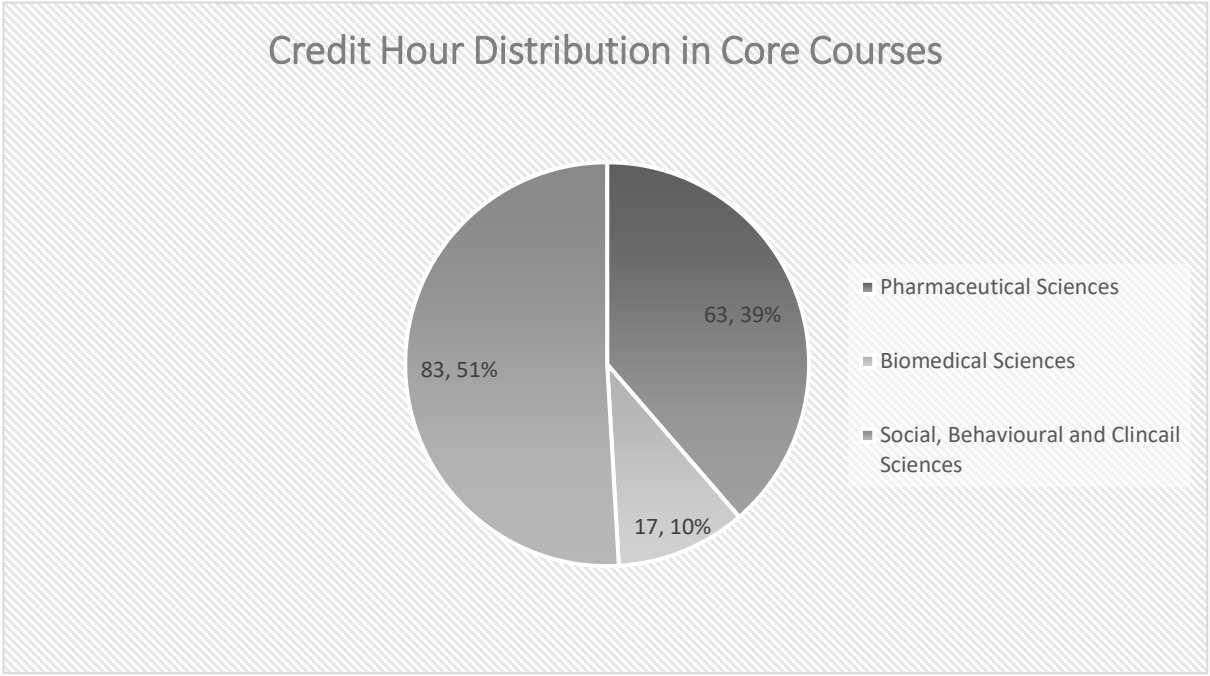
College Requirements

Core Courses:

Core courses	Number of credit hours
Biomedical Sciences	17 Credit Hours
Pharmaceutical Sciences	63 Credit Hours
Social, Behavioral and Clinical Sciences	83 Credit Hours
Total	**163 Credit Hours**

Elective Courses:

Courses	Number of credit hours
Elective course I - Industrial Pharmacy	2 Credit Hours
Elective course I - Drug Discovery	
Elective course II - Pharmacogenomics	2 Credit Hours
Elective course II - Pharmaceutical Biotechnology	
Total	**4 Credit Hours**



Biomedical Sciences

SN	Course Code	Name of the Course	Lectures (Theory)	Practical	Credit Hrs	Contact Hrs
1.	PSL - 214	Structure & Function of Human Body I	4	0	4	4
2.	PSL - 215	Structure & Function of Human Body II	4	0	4	4
3.	PSL - 331	Pathophysiology	3	0	3	3
4.	MBC - 223	Biochemistry I	2	1	3	4
5.	MBC - 228	Biochemistry II	2	1	3	4
Total					**17**	**19**

Pharmaceutical Sciences

SN	Course Code	Name of the Course	Lectures (Theory)	Practical	Credit Hrs	Contact Hrs
1.	PHG - 310	Basics of Natural Products	2	1	3	4
2.	PHG - 411	Complementary & Alternative Medicine	2	0	2	2
3.	PHG - 513	Nutraceuticals & Dietary Supplements	3	0	3	3
4.	PCH - 201	Pharmaceutical Organic Chemistry	3	1	4	5
5.	PCH - 202	Pharmaceutical Analytical Chemistry	2	1	3	4
6.	PCH - 303	Medicinal Chemistry I	3	0	3	3
7.	PCH - 304	Medicinal Chemistry II	3	1	4	5
8.	PCH - 405	Medicinal Chemistry III	3	0	3	3
9.	PHT - 220	Fundamentals of Pharmaceutics	2	1	3	4
10.	PHT - 222	Physical Pharmacy	2	1	3	4
11.	PHT - 223	Microbiology	2	1	3	4
12.	PHT - 321	Immunology	2	0	2	2

13.	PHT - 320	Pharmaceutics I	3	1	4	5
14.	PHT - 323	Pharmaceutics II	3	1	4	5
15.	PHT - 421	Biopharmaceutics & Pharmacokinetics	3	0	3	3
16.	PHT - 521	Modern Pharmaceutical Technology	2	0	2	2
17.	PHL - 331	Pharmacology I	3	0	3	3
18.	PHL - 333	Pharmacology II	3	1	4	5
19.	PHL - 435	Pharmacology III	2	1	3	4
20.	PHL - 436	Pharmacology IV	2	0	2	2
21.	PHL - 537	Toxicology	2	0	2	2
22.	PCH - 406	Drug Discovery (Elective)	2	0	2	2
23.	PHT - 422	Industrial Pharmacy (Elective)				
24.	PHG - 514	Pharmaceutical Biotechnology (Elective)	2	0	2	2
25.	PHL - 538	Pharmacogenomics (Elective)				
Total					**67**	**78**

Social, Behavioral and Clinical Sciences

SN	Course Code	Name of the Course	Lectures (Theory)	Practical	Credit Hrs	Contact Hrs
1	CPH - 241	Pharmacy Orientation	2	0	2	2
2.	CPH - 442	Therapeutics I	4	1	5	7
3.	CPH - 452	Therapeutics II	4	1	5	7
4.	CPH - 553	Therapeutics III	4	1	5	7
5.	CPH - 554	Therapeutics IV	4	1	5	7
6.	CPH - 454	Clinical Pharmacokinetics	2	1	3	4
7.	CPH - 555	Pharmacoepidemiology & Research Methodology	3	0	3	3
8.	CPH - 548	Evidence Based Practice (Drug Information & Literature Evaluation)	2	1	3	4

SN	Course Code	Name of the Course	Lectures (Theory)	Practical	Credit Hrs	Contact Hrs
9.	CPH - 450	Pharmacy Management (Hospital Pharmacy, Pharmacy Administration &Pharmacoeconomics)	3	0	3	3
10.	CPH - 560	Pharm. D Seminar	0	1	1	3
11.	CPH - 556	Self-Care & Nonprescription Drugs	2	0	2	2
12.	CPH - 559	First Aid & Emergency Medicine	0	1	1	3
13.	CPH - 348	Professional Pharmacy Practice Laboratory I	1	1	2	4
14.	CPH - 451	Professional Pharmacy Practice Laboratory II	2	1	3	5
15.	CPH - 558	Professional Pharmacy Practice Laboratory III	2	1	3	5
16.	CPH - 557	Pharmacy Regulation & Ethics	1	0	1	1
17.	CPH - 360	Introductory Pharmacy Practice Experiences I	0	2	2	4
18.	CPH - 460	Introductory Pharmacy Practice Experiences II	0	2	2	4
19.	CPH - 651	Advanced Pharmacy Practice Experiences I	0	4	4	8
20.	CPH - 652	Advanced Pharmacy Practice Experiences II	0	4	4	8
21.	CPH - 653	Advanced Pharmacy Practice Experiences III	0	4	4	8
22.	CPH - 654	Advanced Pharmacy Practice Experiences IV	0	4	4	8
23.	CPH - 655	Advanced Pharmacy Practice Experiences V	0	4	4	8
24.	CPH - 656	Advanced Pharmacy Practice Experiences VI	0	4	4	8
25.	CPH - 657	Advanced Pharmacy Practice Experiences VII	0	4	4	8
26.	CPH - 658	Advanced Pharmacy Practice Experiences VIII	0	4	4	8
Total					**83**	**139**

Course Details by Departments

Department of Pharmaceutical Chemistry							
Course Code	Course Title	Level/ Semester	Units				Pre-requisite
			Lectures (Theory)	Practical	Credit Hrs	Contact Hrs	
PCH - 201	Pharmaceutical Organic Chemistry	3	3	1	4	5	CHEM - 110
PCH - 202	Pharmaceutical Analytical Chemistry	4	2	1	3	4	CHEM - 110
PCH - 303	Medicinal Chemistry I	5	3	0	3	3	PCH - 201
PCH - 304	Medicinal Chemistry II	6	3	1	4	5	PCH - 303
PCH - 405	Medicinal Chemistry III	7	3	0	3	3	PCH - 303
PCH - 406 (Elective)	Drug Discovery	8	2	0	2	2	PCH - 303

Department of Pharmacognosy							
Course Code	Course Title	Level/ Semester	Units				Pre-requisite
			Lectures (Theory)	Practical	Credit Hrs	Contact Hrs	
PHG - 310	Basics of Natural Products	6	2	1	3	4	PCH - 201
PHG - 411	Complementary & Alternative Medicine	7	2	0	2	2	PHL - 331
PHG - 513	Nutraceuticals & Dietary Supplements	10	3	0	3	3	CPH - 556
PHG - 514	Pharmaceutical Biotechnology	10	2	0	2	2	PHL-435-3 MBC - 228

Department of Pharmacology							
Course Code	Course Title	Level/ Semester	Units				Pre-requisite
			Lectures (Theory)	Practical	Credit Hrs	Contact Hrs	
PHL- 331	Pharmacology I	5	3	0	3	3	PSL - 215
PHL - 333	Pharmacology II	6	3	1	4	5	PHL - 331
PHL - 435	Pharmacology III	7	2	1	3	4	PHL - 331
PHL - 436	Pharmacology IV	8	2	0	2	2	PHL - 331
PHL - 537	Toxicology	9	2	0	2	2	PHL - 436
PHL - 538	Pharmacogenomics	10	2	0	2	2	MBC-228 PHL - 435

Department of Pharmaceutics							
Course Code	Course Title	Level/ Semester	Units				Pre-requisite
			Lectures (Theory)	Practical	Credit Hrs	Contact Hrs	
PHT - 220	Fundamentals of Pharmaceutics	3	2	1	3	4	
PHT - 222	Physical Pharmacy	4	2	1	3	4	PHT - 220
PHT - 223	Microbiology	4	2	1	3	4	
PHT - 321	Immunology	5	2	0	2	2	PHT - 223
PHT - 320	Pharmaceutics I	5	3	1	4	5	PHT - 222
PHT- 323	Pharmaceutics II	6	3	1	4	5	PHT - 320
PHT - 421	Biopharmaceutics & Pharmacokinetics	7	3	0	3	3	PHT - 323
PHT - 422	Industrial Pharmacy	8	2	0	2	2	PHT - 323
PHT - 521	Modern Pharmaceutical Technology	10	2	0	2	2	PHT - 323

Department of Clinical Pharmacy							
Course Code	Course Title	Level/ Semester	Units				Pre-requisite
			Lectures (Theory)	Practical	Credit Hrs	Contact Hrs	
CPH - 241	Pharmacy Orientation	3	2	0	2	2	
CPH - 442	Therapeutics I	7	4	1	5	7	PHL - 331
CPH - 452	Therapeutics II	8	4	1	5	7	CPH - 442
CPH - 553	Therapeutics III	9	4	1	5	7	CPH - 442
CPH - 554	Therapeutics IV	10	4	1	5	7	CPH - 442
CPH - 454	Clinical Pharmacokinetics	8	2	1	3	4	PHT - 421
CPH - 555	Pharmacoepidemiology & Research Methodology	9	3	0	3	3	CPH - 450
CPH - 548	Evidence Based Practice (Drug Information & Literature Evaluation)	9	2	1	3	4	CPH - 452
CPH - 450	Pharmacy Management	8	3	0	3	3	
CPH 560	Pharm. D Seminar	10	0	1	1	3	CPH - 555
CPH - 556	Self-Care & Nonprescription Drugs	9	2	0	2	2	CPH - 442
CPH - 559	First Aid & Emergency Medicine	10	0	1	1	3	CPH - 452
CPH - 348	Professional Pharmacy Practice Laboratory I	6	1	1	2	4	PHL - 331
CPH - 451	Professional Pharmacy Practice Laboratory II	8	2	1	3	5	CPH - 348
CPH - 558	Professional Pharmacy Practice Laboratory III	10	2	1	3	5	CPH - 451
CPH - 557	Pharmacy Regulation & Ethics	9	1	0	1	1	CPH - 450
CPH - 360	Introductory Pharmacy Practice Experiences I	SUMMER 6	0	2	2	4	CPH - 348

Department of Clinical Pharmacy							
CPH - 460	**Introductory Pharmacy Practice Experiences II**	**SUMMER 8**	**0**	**2**	**2**	**4**	**CPH - 360**
CPH - 651	**Advanced Pharmacy Practice Experiences I**	**SUMMER 10**	**0**	**4**	**4**	**8**	**All Courses**
CPH - 652	**Advanced Pharmacy Practice Experiences II**	**SUMMER 10**	**0**	**4**	**4**	**8**	
CPH - 653	**Advanced Pharmacy Practice Experiences III**	**11**	**0**	**4**	**4**	**8**	
CPH - 654	**Advanced Pharmacy Practice Experiences IV**	**11**	**0**	**4**	**4**	**8**	
CPH - 655	**Advanced Pharmacy Practice Experiences V**	**11**	**0**	**4**	**4**	**8**	
CPH - 656	**Advanced Pharmacy Practice Experiences VI**	**12**	**0**	**4**	**4**	**8**	
CPH - 657	**Advanced Pharmacy Practice Experiences VII**	**12**	**0**	**4**	**4**	**8**	

Academic Plan of Pharm. D Program

Year	Level	Course Code	Course Title	Credit Hours	Required Course	Total Hours
1st	1	ENG - 019	Intensive English Program	6 (6+0)		10
		ICI-111	The Entrance to the Islamic Culture	2 (2+0)		
		ARAB - 201	Arabic Language Skills	2 (2+0)		
	2	PHYS - 102	General Physics for Health Sciences	4 (3+1)	019ENG-6	14
		ZOOL - 105	Zoology for Health Sciences	4 (3+1)	019ENG-6	
		CHEM - 110	General Chemistry for Health Sciences	2 (1+1)	019ENG-6	
		CHEM - 111	Organic Chemistry for Health Sciences	3 (2+1)	019ENG-6	
		COMM - 141	Basic Biostatistics	1 (1+0)	019ENG-6	
2nd	3	PHT - 220	Fundamentals of Pharmaceutics	3 (2+1)		18
		PCH - 201	Pharmaceutical Organic Chemistry	4 (3+1)	CHEM - 110	
		PSL - 214	Structure & Function of Human Body I	4 (4+0)	ZOOL - 105	
		MBC - 223	Biochemistry I	3 (2+1)	CHEM - 110	
		CPH - 241	Pharmacy Orientation	2 (2+0)		
		ICI - 112	Islamic Culture II	2 (2+0)		
	4	PHT - 222	Physical Pharmacy	3 (2+1)	PHT - 220	18
		PCH - 202	Pharmaceutical Analytical Chemistry	3 (2+1)	CHEM - 110	
		MBC - 228	Biochemistry II	3 (2+1)	MBC - 223	
		PSL - 215	Structure & Function of Human Body II	4 (4+0)	PSL - 214	
		PHT - 223	Microbiology	3 (2+1)		
		ARAB - 202	Arabic Editing	2 (2+0)		
3rd	5	PSL - 331	Pathophysiology	3 (3+0)	PSL - 215	17
		PCH - 303	Medicinal Chemistry I	3 (3+0)	PCH - 201	
		PHL - 331	Pharmacology I	3 (3+0)	PSL - 215	
		PHT - 321	Immunology	2 (2+0)	PHT - 223	
		PHT - 320	Pharmaceutics I	4 (3+1)	PHT - 222	
		ICI - 113	Islamic Culture III	2 (2+0)		
	6	PCH - 304	Medicinal Chemistry II	4 (3+1)	PCH - 303	19
		PHL - 333	Pharmacology II	4 (3+1)	PHL - 331	
		PHT - 323	Pharmaceutics II	4 (3+1)	PHT - 320	
		PHG - 310	Basics of Natural Products	3 (2+1)	PCH - 201	

Year	Level	Course Code	Course Title	Credit Hours	Required Course	Total Hours
		CPH - 348	Professional Pharmacy Practice Laboratory I	2 (1+1)	PHL - 331	
		CPH - 360	Introductory Pharmacy Practice Experiences I (**Summer Training)**	2 (0+2)	CPH - 348	
4th	**7**	PCH - 405	Medicinal Chemistry III	3 (3+0)	PCH - 303	**16**
		PHL - 435	Pharmacology III	3 (2+1)	PHL - 331	
		CPH - 442	Therapeutics I	5 (4+1)	PHL - 331	
		PHT - 421	Biopharmaceutics & Pharmacokinetics	3 (3+0)	PHT - 323	
		PHG - 411	Complementary & Alternative Medicine	2 (2+0)	PHL - 331	
	8	PHL - 436	Pharmacology IV	2 (2+0)	PHL - 331	**20**
		CPH - 452	Therapeutics II	5 (4+1)	CPH - 442	
		CPH - 454	Clinical Pharmacokinetics	3 (2+1)	PHT - 421	
		CPH - 450	Pharmacy Management	3 (3+0)		
		CPH - 451	Professional Pharmacy Practice Laboratory II	3 (2+1)	CPH - 348	
		PHT - 422	Elective course I - Industrial Pharmacy	2 (2+0)	PHT - 323	
		OR				
		PCH - 406	Elective course I - Drug Discovery	2 (2+0)	PCH - 303	
		CPH - 460	Introductory Pharmacy Practice Experiences II (**Summer Training)**	2 (0+2)	CPH - 360	
5th	**9**	PHL - 537	Toxicology	2 (2+0)	PHL - 436	**18**
		CPH - 553	Therapeutics III	5 (4+1)	CPH - 442	
		CPH - 557	Pharmacy Regulations & Ethics	1 (1+0)	CPH - 450	
		CPH - 555	Pharmacoepidemiology & Research Methodology	3 (3+0)	CPH - 450	
		CPH - 556	Self-care & Nonprescription Drugs	2 (2+0)	CPH - 442	
		ICI - 114	Islamic Culture IV	2 (2+0)		
		CPH – 548	Evidence Based Practice	3 (2+1)	CPH – 452	

Year	Level	Course Code	Course Title	Credit Hours	Required Course	Total Hours
	10	CPH - 554	Therapeutics IV	5 (4+1)	CPH - 442	17
		CPH - 558	Professional Pharmacy Practice Laboratory III	3 (2+1)	CPH - 451	
		CPH - 559	First Aid & Emergency Medicine	1 (0+1)	CPH - 452	
		CPH - 560	Pharm. D Seminar	1 (0+1)	CPH - 555	
		PHT - 521	Modern Pharmaceutical Technology	2 (2+0)	PHT - 323	
		PHG - 513	Nutraceuticals & Dietary Supplements	3 (3+0)	CPH - 556	
		PHL - 538	Elective course II - Pharmacogenomics	2 (2+0)	MBC - 228 PHL - 435	
		OR				
		PHG - 514	Elective course II - Pharmaceutical Biotechnology)	2 (2+0)	MBC-228 PHL-435	
6th	11	CPH - 651	Advanced Pharmacy Practice Experience I **(Summer Training)**	4 (0+4)	All Courses	32
		CPH - 652	Advanced Pharmacy Practice Experience II **(Summer Training)**	4 (0+4)		
		CPH - 653	Advanced Pharmacy Practice Experience III	4 (0+4)	All Courses	
		CPH - 654	Advanced Pharmacy Practice Experience IV	4 (0+4)		
		CPH - 655	Advanced Pharmacy Practice Experience V	4 (0+4)		
	12	CPH - 656	Advanced Pharmacy Practice Experience VI	4 (0+4)		
		CPH - 657	Advanced Pharmacy Practice Experience VII	4 (0+4)		
		CPH - 658	Advanced Pharmacy Practice Experience VIII	4 (0+4)		
Total Credit Hours for The Program						**199**

Courses Overview – Department of Pharmaceutical Chemistry

Course Information

Code:	PCH-201	**Level:**	3
Title:	Pharmaceutical Organic Chemistry	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	3+1	**Prerequisites**:	CHEM-110

Course Description

The course provides the general introduction of organic chemistry, different functional groups, IUPAC nomenclatures and different classes of organic compounds covering their preparations, properties and reactions. The focus will be on the mechanism of reactions and stereochemical aspects of organic molecules. The chemistry and applications of heterocyclic compounds will be dealt in detail. The laboratory classes will involve the identification of different functionalities in organic compounds.

Topics

- Introduction to organic chemistry
- Structure of organic molecules
- Classification and nomenclature of organic compounds
- Organic reactions and their mechanisms
- Review of aliphatic compounds
- Aromatic compounds: benzene and its derivatives
- Aromatic aldehydes and ketones
- Aromatic carboxylic acids
- Derivatives of carboxylic acids
- Phenols
- Aromatic amines
- Polynuclear aromatic compounds
- Heterocyclic compounds
- Stereo-chemistry

Course Information

Code:	PCH-202	**Level:**	4
Title:	Pharmaceutical Analytical Chemistry	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	2+1	**Prerequisites**:	PCH-201

Course Description

The course provides the general ideas of analytical techniques and their applications in the field of pharmaceutical sciences – including volumetric methods of analysis (acid-base titrations, redox titrations, precipitation titrations, and complexometric titrations). The course will focus on Chromatography (TLC, LC, HPLC, and GC) and spectroscopy including UV-Vis spectrometry, infrared spectrometry, nuclear magnetic resonance spectroscopy and mass spectrometry.

Topics

- Introduction to pharmaceutical analytical chemistry
- Analytical titrations
- Chromatography
- Gas chromatography
- High performance liquid chromatography
- Uv-visible spectroscopy
- Spectrofluorometry
- Infra-red spectroscopy
- Mass spectrometry
- Nuclear magnetic spectroscopy

Course Information

Code:	PCH-303	**Level:**	5
Title:	Medicinal Chemistry I	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	3+0	**Prerequisites**:	PCH-201

Course Description

The course provides an understanding of the fundamental principles of medicinal chemistry. The student will be introduced to primary drug targets, physicochemical properties in relation to biological action, drug metabolism, role of stereochemistry in drug action and drug transporters. It also covers the development of drugs acting on autonomic nervous system, non-steroidal anti-inflammatory drugs, opioid analgesics, antihistamines and antiulcer drugs with emphasis on structure activity relationship. The students will also be introduced to the biotechnology drugs.

Topics

- Introduction to medicinal chemistry
- Drugs and drug targets
- Physicochemical properties in relation to biological action
- Stereochemistry and drug action
- Drug metabolism
- Membrane drug transporters
- Adrenergic drugs
- Non-steroidal anti-inflammatory drugs
- Opioid analgesics
- Antihistaminic drugs
- Gastrointestinal drugs

Course Information

Code:	PCH-304	**Level:**	6
Title:	Medicinal Chemistry II	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	3+1	**Prerequisites**:	PCH-303

Course Description

This course is designed to provide the knowledge to the students on physicochemical properties in relation to biological action, drug metabolism, role of stereochemistry in drug action and drug transporters. It covers the development of drugs acting on central nervous system, cardiovascular system, local anesthetics and diuretics with emphasis on structural features of drug molecules that are responsible for their activity (structure-activity relationships; SARs). The synthesis of some biologically important drugs will be introduced in this course. The purpose of practical section of this course is to expose the student to some synthetic and purification techniques in medicinal chemistry with some selected drugs.

Topics

- General anesthetics
- Sedatives and hypnotics
- Antianxiety agents
- Antipsychotics
- Anti-epileptics (anticonvulsants)
- Antiparkinsonian drugs
- CNS stimulants
- Antidepressants
- Drugs affecting serotonergic neurotransmission
- Local anesthetics
- Cardiovascular drugs:
- Anti-anginal drugs
- Anti-arrhythmic drugs
- Antihypertensive drugs
- Antihyperlipidimic drugs
- Antithrombotics
- Diuretics

Course Information

Code:	PCH-405	**Level:**	7
Title:	Medicinal Chemistry III	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	3+0	**Prerequisites**:	PCH-304

Course Description

This course is designed to provide the knowledge to the students on physicochemical properties in relation to biological action, drug metabolism, role of stereochemistry in drug action and drug transporters. It covers the development of chemotherapeutic agents such as anticancer, antibacterial, antimycobacterial, antiviral, antifungal and antiparasitic agents with emphasis on structural features of drug molecules that are responsible for their activity (structure-activity relationships; SARs).

Topics

- Introduction
- Synthetic antibacterial agents
- Antibiotics
- Antimycobacterial drugs
- Antiparasitic drugs
- Antifungal agents
- Antiviral agents
- Anticancer agents
- Steroidal and other hormonal agents

Course Information

Code:	PCH-406	**Level:**	8
Title:	Drug Discovery	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	2+0	**Prerequisites**:	PCH-405

Course Description

Drug discovery course aims to provide students with an understanding of the process of drug discovery and development from the identification of novel drug targets to the introduction of new drugs into clinical practice. It covers the basic principles of how new drugs are discovered with emphasis on lead identification, lead optimization, classification and kinetics of molecules targeting enzymes and receptors, prodrug design and applications, as well as structure-based drug design methods. Recent advances in the use of computational and combinatorial chemistry in drug design will also be presented.

Topics

- Introduction to drug design and discovery
- Sources of drugs and lead compounds
- Rationale approaches to lead optimization
- Enzymes as targets of drug design
- Receptors as targets of drug design
- Prodrug design and applications
- Combinatorial chemistry
- Computer-aided drug design

Courses Overview – Department of Pharmacognosy

Course Information

Code:	PHG-310	**Level:**	6
Title:	Basics of Natural Products	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	2+1	**Prerequisites**:	PCH-201

Course Description

This course introduces the importance of pharmacognosy as an applied branch of science. It shows the steps required for drug discovery from natural products as well as its quality control. It gives a detailed study of primary and secondary metabolites present in the plants, such as; carbohydrates, lipids, tannins, alkaloids, glycosides, and essential oils. Emphasis is given to the chemistry and uses of certain selected compounds from these classes and their biological sources.

Topics

- Introduction and history of pharmacognosy
- Drug discovery from natural products
- Extraction of phytoconstituents
- Secondary metabolites and biogenetic pathways
- Carbohydrates
- Tannins
- Glycosides
- Alkaloids
- Volatile oils: extraction and medicinal uses
- Bitter principles and Resins

Course Information

Code:	PHG-411	**Level:**	7
Title:	Complementary and Alternative Medicine	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	2+0	**Prerequisites**:	PHL-331

Course Description

This course provides an overview of complementary and alternative medicine (CAM) practices utilized by number of health-care practitioners. It introduces the philosophies, techniques, and evidence of the efficacy of CAM therapeutics currently in use, including homeopathy, naturopathy, aromatherapy, acupuncture, chiropracty and herbal medicine. The history and development of these selected CAM practices, how they work, and their relationship to conventional allopathic medicine are discussed. The course also covers herbal medicine as one of the complementary practices where the students get acquainted with the use of herbal drugs for the prevention and treatment of some of the common diseases.

Topics

- Introduction to complementary and alternative medicine
- Homeopathy
- Aromatherapy
- Acupuncture
- Chiropractic
- Osteopathy
- Naturopathy
- Reflexology
- Magnetotherapy
- Prophetic Medicine
- Ayurveda & Unani
- Herbal medicine

Course Information

Code:	PHG-513	**Level:**	10
Title:	Nutraceuticals and Dietary Supplements	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	3+0	**Prerequisites**:	CPH-556

Course Description

This course is intended to give basic knowledge about the nutraceuticals and dietary supplements, including their history, scope and future prospective. It gives detailed knowledge about various nutraceuticals available in the market which are reported to have therapeutic effect in many ailments affecting different systems in the human body such as the cardiovascular, the central nervous, and the respiratory systems. The course also describes the different nutraceuticals and dietary supplements available for bone, eye and oral health, as well as weight management and cancer prevention.

Topics

- Introduction
- Joint Health
- Cardiovascular Health
- Eye health
- Cancer prevention
- Weight management
- Mental health
- Respiratory Health
- Oral Health
- Miscellaneous nutraceuticals

Course Information

Code:	PHG-514	**Level:**	10
Title:	Pharmaceutical Biotechnology	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	2+0	**Prerequisites**:	MBC-228 PHL-435

Course Description

The course will serve as an introductory course on biotechnological approaches that are used in the production of clinically useful biopharmaceuticals. The course will review topics like cell structure and organization, protein synthesis (transcription and translation) and structure of protein. The course will introduce students to biotechnological concepts including recombinant DNA technology, monoclonal antibodies, gene therapy, vaccines, stem cells and fermentation technology. The course will also deal with analytical techniques like gel electrophoresis, southern, northern and western blotting, dot-blot hybridization, DNA sequencing, polymerase chain reaction and Enzyme-linked immunosorbent assay.

Topics

- Introduction to Pharmaceutical Biotechnology
- Cell structure and organization
- Amino acids and proteins
- Nucleic acids and protein synthesis
- Recombinant DNA technology
- Analytical techniques
- Monoclonal antibodies
- Gene therapy
- Vaccines
- Stem cell technology
- Transgenic and knockout mice
- Fermentation technology

Courses Overview – Department of Pharmaceutics

Course Information

Code:	PHT-220	**Level:**	3
Title:	Fundamentals of Pharmaceutics	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	2+1	**Prerequisites**:	None

Course Description

This course is designed to impart a fundamental understanding of the pharmaceutical basics relevant to dosage forms, development and production. This course covers parts of prescription, abbreviation, model prescription, labeling, weighing and measuring for compounding extemporaneous preparation and related incompatibilities. In addition, calculations needed in prescription and compounding of pharmaceutical preparations are covered.

Topics

- Introduction
- Pharmaceutical dosage forms
- Pharmaceutical routes of administration
- Units and measurement systems
- Concentration and dilution
- Prescription
- Dose calculations
- Buffers and buffer solutions
- Basics of ADME algebra and graphs
- Compounding specialized formulas
- Incompatibilities

Course Information

Code:	PHT-222	**Level:**	4
Title:	Physical Pharmacy	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	2+1	**Prerequisites**:	PHT-220

Course Description

This course deals with basic physicochemical properties influencing pharmaceutical dosage form design and efficiency. This course helps pharmacy student to understand the concepts of different liquid dosage forms and their applications. The following key topics will cover: molecular forces, different types of solutions, buffered and isotonic solutions, surface and interfacial phenomena, complexation, colloids, and rheology.

Topics

- Intermolecular binding forces
- States of matter
- Phase equilibria and the phase rule
- Solutions of non-electrolytes
- Solutions of electrolytes
- Rheology
- Surface and interfacial phenomena
- Colloids
- Concept of complexation

Course Information

Code:	PHT-223	**Level:**	4
Title:	Microbiology	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	2+1	**Prerequisites**:	None

Course Description

This is an introductory study of microbiology. This course provides basic theoretical and practical knowledge of structures and functions of bacteria, viruses, fungi and parasites to students. The course covers basic physiology of microbes, it also deals with the mechanism of infection, pathogenesis, transmission and control of several different microbes as well as introduces the basic concept of disinfectants. Metabolic engineering and microbial biotransformation are also part of the curriculum.

Topics

- Introduction to Microbiology
- Prokaryotic Microbes: Bacteria
- Eukaryotic Microbes: Fungi
- Eukaryotic Microbes: Parasites
- Virology
- Disinfectants
- Metabolic engineering and microbial biotransformation
- Microbiota therapy

Course Information

Code:	PHT-320	**Level:**	5
Title:	Pharmaceutics I	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	3+1	**Prerequisites**:	PHT-222

Course Description

This course is designed to give a detailed background on solid dosage forms (powder, tablet, capsule, and suppository), semi-solid dosage forms (ointment, cream, gel, paste, etc.), and transdermal drug delivery systems. This course helps pharmacy students to understand the basic principles, their physiochemical properties, and the techniques involved in the formulation, preparation, current manufacturing practices, quality control tests and their medical rationale for solid and semisolid dosage forms. In addition, this course covers the principles of transdermal drug delivery systems and their medical rationales, advantages, drug properties, and permeation enhancer strategies.

Topics

- Powders
- Granules
- Tablets
- Capsules
- Suppositories
- Semisolid Dosage Forms
- Transdermal drug delivery systems (TDDS)

Course Information

Code:	PHT-321	**Level:**	5
Title:	Immunology	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	2+0	**Prerequisites**:	PHT-223

Course Description

This course familiarizes students on how the human body defense system protects the body against pathogenic agents (foreign or self) responsible for causing diseases as well as the molecular and cellular factors involved in preventing and controlling those diseases. The key topics in the course are: basic concepts of immunity, immune responses and regulations, autoimmunity, immunodeficiency diseases and pharmaceutical immunological products and their roles in prophylaxis, transplantation and diagnostics.

Topics

- Basic concept of immunity and immune system
- The innate immune system
- The adaptive immune system
- Vaccines
- Clinical aspects of immunity
- Immunoassays and immunodiagnostics
- Hybridoma technology

Course Information

Code:	PHT-323	**Level:**	6
Title:	Pharmaceutics II	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	3+1	**Prerequisites**:	PHT-320

Course Description

This course is designed to help pharmacy students to understand the concepts of solubility and solubilization techniques, liquid dosage forms, and types of these dosages (pharmaceutical solutions, pharmaceutical suspensions, pharmaceutical emulsions and pharmaceutical aerosols), preparation methods, and rationale of clinical uses, clinical applications, and their benefits over other oral dosage forms and common stability issues. In addition, this course deals with the principles and techniques involved in the formulation of sterile dosage forms (parenteral and ophthalmic products, and total parenteral nutrition (TPN)). Moreover, additional relevant topics are going to be delivered: Introduction to Biopharmaceuticals, and challenges of formulation of biopharmaceuticals and vaccines; and different methods of sterilization techniques.

Topics

- Solubility and various methods of enhancing solubility
- Pharmaceutical solutions
- Coarse dispersions I (Suspensions)
- Coarse dispersions II (Emuslsions)
- Sterilization Techniques
- Parenteral products
- Depression in freezing point, isotonicity and milliequivalent calculations
- Ophthalmic preparations
- Biopharmaceuticals
- Total parenteral nutrition (TPN)
- Pharmaceutical aerosols.

Course Information

Code:	PHT-421	**Level:**	7
Title:	Biopharmaceutics and Pharmacokinetics	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	3+0	**Prerequisites**:	PHT-323

Course Description

This course familiarizes students with the basic principles and concepts of biopharmaceutics and pharmacokinetics that can be applied to drug development and dosage regimen design. A comprehensive understanding of the drug journey (absorption, distribution, metabolism and excretion) within human body will be explained. It discusses different factors such as physiochemical properties of the drug, route of administration and dosage forms design, and anatomical and physiological factors and their impacts on the time course of drug concentrations in the body. Moreover, this course explains fundamental knowledge of bioavailability and bioequivalence.

Topics

- Introduction to Biopharmaceutics.
- ADME Basics
- Absorption of drugs
- Distribution of drugs
- Elimination of Drugs
- Bioavailability and Bioequivalence
- Pharmacokinetics of Intravascular Drug Administration
- Pharmacokinetics of Extravascular Drug Administration
- Multiple Dosage Regimens
- Nonlinear Pharmacokinetics

Course Information

Code:	PHT-422	**Level:**	8
Title:	Industrial Pharmacy	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	2+0	**Prerequisites**:	PHT-323

Course Description

The course deals with the main operations that take place in industrial pharmacy and the equipment carrying out such operations. These operations include: size reduction, particle size analysis and mixing, filtration, heat flow, drying process, freeze drying, spray drying, evaporation, crystallization, tablets, tablet coating. Students are able to understand the common knowledge of other industrial aspects such as good manufacturing practice (GMP) and quality assurance are also included in this course. Emphasis will be given to pharmaceutical machines.

Topics

- Introduction to industrial Pharmacy and GMP (Good manufacturing practice)
- Pharmaceutical milling/size reduction
- Pharmaceutical Crystallization
- Pharmaceutical Drying
- Pharmaceutical mixing and mixture machines for dry powders, pastes, etc.
- Pharmaceutical filtration
- Evaporation Technique
- Centrifugation process
- Pharmaceutical coating (Tablet) technology and materials
- Pharmaceutical quality control of different dosages and quality assurance

Course Information

Code:	PHT-521	**Level:**	10
Title:	Modern Pharmaceutical Technology	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	2+0	**Prerequisites**:	PHT-323

Course Description

The course applies the concepts of newer methods of drug delivery systems involved in the pharmaceutical sciences, interpret physicochemical properties of the drug with the drug delivery system modules and to know the various types of novel drug delivery systems, mechanism of drug delivery, and drug targeting strategies.

Topics

- Introduction to modern pharmaceutical technology
- Oral controlled drug delivery systems
- Parenteral Controlled Drug Delivery
- Microtechnology and Nanotechnology in Drug Delivery
- Targeted drug delivery systems
- Transdermal Drug Delivery Systems
- Nasal and pulmonary drug delivery systems
- Ocular drug delivery systems
- Drug delivery through the Blood-Brain Barrier (BBB)
- Oral protein and peptide delivery
- Pharmaceutical gene delivery systems
- Recent advances in cancer therapy

Courses Overview – Department of Pharmacology

Course Information

Code:	PHL-331	**Level:**	5
Title:	Pharmacology I	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	3+0	**Prerequisites**:	PSL-215

Course Description

This course is designed to develop an understanding of the theoretical concepts surrounding pharmacology, such as the pharmacokinetics and pharmacodynamics of drugs, and the concepts surrounding pharmacotherapy. It gives specific information concerning the drugs acting on the autonomic nervous system, smooth muscles, blood, inflammation, gout and gastrointestinal system. For every class of drugs, the mode of action, the clinical effects and the side effects will be emphasized.

Topics

- Introduction to Pharmacology
- Pharmacodynamics
- Pharmacokinetics and biotransformation
- Introduction to autonomic pharmacology
- Cholinoceptor-activating and cholinesterase-inhibiting drugs
- Cholinoceptor-blocking drugs
- Adrenoceptor agonists and sympathomimetic drugs
- Adrenoceptor antagonist drugs
- Histamine, serotonin, and ergot alkaloids
- Eicosanoids: prostaglandins, thromboxanes, leukotrienes, and related compounds
- Agents used in cytopenias and hematopoietic growth factors
- Nonsteroidal anti-inflammatory drugs, and drugs for gout
- Rheumatoid arthritis & other autoimmune diseases
- Drugs used in the treatment of gastrointestinal diseases

Course Information

Code:	PHL-333	**Level:**	6
Title:	Pharmacology II	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	3+1	**Prerequisites**:	PHL-331

Course Description

This course introduces the student to central nervous system and endocrine pharmacology. Students will be taught disorders related to the central nervous system and endocrine system along with classification, pharmacological actions, mechanisms of action, drug interaction, and clinical applications of drugs used in the central nervous system and endocrine system. The practical part of the course deals with the verification of the actions of drugs studied in the theoretical part of the course using appropriate practical demonstrations.

Topics

- Hypothalamic pituitary hormones
- Pancreatic hormones and antidiabetic drugs
- Adrenocorticosteroids and adrenocortical antagonists
- Thyroid and antithyroid drugs
- The gonadal hormones and inhibitors
- Introduction to the Pharmacology of CNS Drugs
- Antiseizure drugs
- Sedative and hypnotic drugs
- Pharmacologic management of parkinsonism and other movement disorders
- General anesthetics
- Local anesthetics
- Antidepressants
- Antipsychotic agents and lithium
- Opioid analgesics and antagonists
- Skeletal Muscle Relaxants
- Drugs of abuse

Course Information

Code:	PHL-435	**Level:**	7
Title:	Pharmacology III	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	2+1	**Prerequisites**:	PHL-331

Course Description

The course aims to develop the student's ability to implement individualized pharmaceutical care for people receiving anti-cancer and antimicrobial therapy to identify and manage common side effects and drug-drug interactions, using current evidence-based practices. This course will provide an introduction to the principles of chemotherapy and to examine the mechanisms by which drugs may have anticancer effects and immuno-therapeutic effects. Also this course deals with the application to the uses of drugs studied in the theoretical part of the course and drug-interaction using case studies and presentations.

Topics

- Introduction to cancer biology
- Pharmacology of conventional antineoplastic agents
- Immunotherapeutics
- Strategies to overcome drug resistance in cancer therapy
- Gene editing in cancer
- Basic principles of antimicrobial chemotherapy
- Antibiotics resistance
- Beta-Lactam & Other Cell Wall and Membrane-Active Antibiotics
- Protein synthesis Inhibitors
- Aminoglycosides and Spectinomycin
- Sulfonamides, Trimethoprim and Quinolones
- Antimycobacterial Drugs
- Antifungal Agents
- Antihelminthic
- Antiprotozoal Drugs
- Anti-malarial Drugs
- Antiviral Drugs
- Drugs for HIV/AIDS

Course Information

Code:	PHL-436	**Level:**	8
Title:	Pharmacology IV	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	2+0	**Prerequisites**:	PHL-331

Course Description

This course is designed to develop an understanding of the theoretical knowledge related to pharmacology of respiratory, cardiovascular and to develop pharmacological knowledge on drugs commonly used in pediatrics, geriatrics and pregnant patients. For every class of drugs, the mode of action, the clinical effects and the side effects will be emphasised. This course is designed to develop an understanding of the theoretical concepts surrounding, pediatric, pregnancy, geriatric, respiratory and cardiovascular pharmacology, such as the pharmacokinetics and pharmacodynamics of drugs. For every class of drugs, the mode of action, the clinical effects and the side effects will be emphasised.

Topics

- Drugs used in the treatment of Respiratory system
- Drugs Used in Pregnancy
- Pediatric Pharmacology
- Geriatric Pharmacology
- Introduction to heart physiology
- Antihypertensive Agents
- Diuretic Agents
- Vasodilators & the Treatment of Angina Pectoris
- Drugs used in heart failure
- Agents Used in Cardiac Arrhythmias
- Drugs used in hypotension and shocks
- Drugs used in disorders of coagulation
- Agents used in dyslipidemia

Course Information

Code:	PHL-537	**Level:**	9
Title:	Toxicology	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	2+0	**Prerequisites**:	PHL-436

Course Description

This course is designed to provide the knowledge about various kinds of pharmaceutical drugs and other common toxicants and their relation to toxicokinetics and toxicodynamics principles. This course is structured to comprehensively provide the student with the fundamental concepts of clinical toxicology. Particularly, basic management methods, procedures and specific antidotes commonly employed in clinical toxicology are introduced and explained as well as the concept of clinical toxicology within the field of pharmaceutical healthcare. It aims to supplement this information with frequent case studies, and critical thinking exercises, using active learning methods and assignments. Special toxicity of commonly used pesticides, heavy metals poisoning and environmenmtal pollutants will also be covered in this course.

Topics

- Measuring Toxicity and Assessing Risk
- Toxicokinetic of xenobiotics
- Biotransformation of toxicants
- Mechanisms of toxic effects
- Genetic & Cancer Toxicology
- Toxicology of the liver
- Toxicology of the kidney
- Toxicology of the immune system
- Respiratory system toxicology
- Toxicology of the skin
- Toxicology of the eye
- Toxicology of the nervous system
- Toxicology of the cardiovascular system
- Toxicology of the reproductive systems
- Toxicology of endocrine-disrupting chemicals
- Toxicity of pesticides
- Toxicity of metals
- Environmental pollutants (Environmental toxicology)
- Occupational toxicology
- Forensic toxicology

Course Information

Code:	PHL-538	**Level:**	10
Title:	Pharmacogenomics	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	2+0	**Prerequisites**:	PHL-435, MBC-228

Course Description

This advanced course is about the study of how genes affect an individual response to drugs. Students will get the knowledge of combining pharmacology (the science of drugs) and genomics (the study of genes and their functions) to develop effective, safe medications and doses that will be tailored to a person's genetic makeup. As knowledge of the genetic basis of disease increases, so does the opportunities for drug targeting and patient specific-treatments. This course uses cognitive and technical skills to understand the molecular basis of altered health states and the drug response towards personalized medicine.

Topics

- Introduction to Pharmacogenomics
- Molecular Biology Review I-III
- Individual variation, pharmacogenomics and personalized medicine
- Overview of human genomics
- Making precision medicine a reality through genomics
- The influence of pharmacogenetics on pharmacokinetics and pharmacodynamics
- Pharmacogenetics of phase I and II drug-metabolizing enzymes (I-II)
- Pharmacogenomics in Cancer Therapeutics
- Pharmacogenomics in Cardiovascular Diseases
- Pharmacogenomics in Psychiatry Disorders
- Role of Pharmacogenomics in HIV Infection
- Role of Pharmacogenomics in Diabetes

Courses Overview – Department of Clinical Pharmacy

Course Information

Code:	CPH-241	**Level:**	3
Title:	Pharmacy Orientation	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	2+0	**Prerequisites**:	None

Course Description

This course aims to introduce pharmacy as a profession to the newly admitted pharmacy students. The students will learn the historical background and the modern development of the pharmacy profession. It also covers other aspects, such as university and college resources, professionalism, and pharmacy scope. This course is also primarily designed to prepare students to understand and learn basic medical language in written and oral form to properly communicate with the other healthcare team members.

Topics

- History of pharmacy
- Pharm. D program at KKU
- Available academic and learning resources
- Professionalism
- Pharmaceutical organizations
- Basic word structure
- Prefixes
- Suffixes
- Organization of body
- Medical specialists and case reports

Course Information

Code:	CPH-348	**Level:**	6
Title:	Professional Pharmacy Practice Laboratory I	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	1+1	**Prerequisites**:	PHL-331

Course Description

This course is the first one in a series of three professional pharmacy practice laboratories to enable the students incorporate knowledge and skills to practical situations required for providing pharmaceutical care. The first course focuses on community pharmacy services and the needed communication skills, such as patient interviewing, history taking and counseling the patient regarding over-the-counter medications.

Topics

- Introduction
- Communication
- Medication history
- Professionalism
- Community pharmacy
- Pharmaceutical care services
- Immunizations
- Patient counseling for over-the-counter drugs and prescriptions
- Polypharmacy and adherence
- Pharmacotherapy planning and documentation
- Formal case presentation
- Health insurance

Course Information

Code:	CPH-442	**Level:**	7
Title:	Therapeutics I	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	4+1	**Prerequisites**:	PHL-331

Course Description

This is an introductory course for the basics of therapeutics. It is the first in a series of four courses scheduled sequentially from level seven to level ten. It is designed to provide students with fundamental knowledge in a variety of areas including gastrointestinal, renal, and hepatic diseases.

Topics

- Orientation and introduction & clinical pharmacy terminology
- Lab interpretation
- Gastrointestinal diseases
- Renal diseases
- Hepatic diseases
- Anaphylaxis and drug allergies

Course Information

Code:	CPH-450	**Level:**	8
Title:	Pharmacy Management	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	3+0	**Prerequisites**:	

Course Description

Course is designed to teach students the requisite skills needed to perform managerial functions in the hospital, community and institutional pharmacy. Includes planning and integrating professional services, budgeting, inventory control, and human resource management topics and also describes the complexities of pharmacoeconomics in various pharmacy practice settings.

Topics

- Principles and characteristics of effective pharmacy management
- Managing people
- Managing pharmacy (hospital pharmacy) operations
- Managing clinical services
- Managing pharmacy automation and informatics
- Managing risk
- Preventing and managing medication errors: the pharmacist's role
- Quality management system for pharmacy practice
- Purchasing and inventory management
- Integrating pharmacoeconomics principles and pharmacy management
- Marketing the pharmacy
- Budgeting and accounting
- Effective communication
- Leadership
- Audits and reviews

Course Information

Code:	CPH-451	**Level:**	8
Title:	Professional Pharmacy Practice Laboratory II	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	2+1	**Prerequisites**:	CPH-348

Course Description

This course is the second in a series of three professional pharmacy practice laboratories to enable the students incorporate knowledge and skills to practical situations required for providing pharmaceutical care. It will focus on the hospital pharmacy structure and operations. It is designed to learn the role of pharmacists in pharmacy and therapeutic committee, formulary management, and ambulatory care setting. Another important aspect covered by this course are practice of physical assessment skills and discharge counseling services.

Topics

- Hospital pharmacy
- Clinical pharmacy discharge counseling services
- Pharmacy and therapeutics committee
- Formulary management
- Pharmacist-managed dosage form conversion services
- General risk assessment tools
- Vital signs
- Acquisition and practice of physical assessment skills
- Ambulatory care pharmacy
- Providing support for clinical reasoning

Course Information

Code:	CPH-452	**Level:**	8
Title:	Therapeutics II	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	4+1	**Prerequisites**:	CPH-442

Course Description

This course is designed to provide students with a fundamental knowledge of neurological, psychiatric, and pulmonary diseases, as well as considerations and precautions in selections, dosing and monitoring of drugs used to treat commonly encountered pharmacotherapeutic problems.

Topics

- Neurological diseases
- Anemias
- Psychiatric diseases
- Pulmonary diseases

Course Information

Code:	CPH-454	**Level:**	8
Title:	Clinical Pharmacokinetics	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	2+1	**Prerequisites**:	PHT-421

Course Description

The course illustrates how pharmacokinetics relates to the clinical practice in term of therapeutic dosage regimen design and interpretation. The course includes reviewing the basic pharmacokinetic parameters and pharmacodynamics backgrounds that assist student to evaluate and assess the used route of administrations and use of appropriate therapeutic drug monitoring for certain drugs that need utmost attention. Also, pharmacokinetic models will relate the exposure and effect of the drug that is needed to evaluate drug progression and in clinical trial simulations.

Topics

- Pharmacokinetics review
- Antibiotics
- Cardiovascular agents
- Anticonvulsants
- Immunosuppressants
- Other drugs
- Pharmacogenetics drug interactions

Course Information

Code:	CPH-548	**Level:**	9
Title:	Evidence Based Practice	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	2+1	**Prerequisites**:	CPH-452

Course Description

This course is designed to provide the student with advanced research and professional skills required to practice scientific literature review and drug information services. On completion of the course, the student will develop a lifelong ability to understand how evidence is generated, retrieved, synthesized, critically appraised and employed in specific areas of health care setting.

Topics

- Biomedical literature and drug information
- Resource use and management
- Evaluation and appraisal of literature
- Evidence-based practice
- Evidence-based medicine
- Advanced evidence-based medicine skills
- Evaluation and application of evidence to policy and practice

Course Information

Code:	CPH-553	**Level:**	9
Title:	Therapeutics III	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	4+1	**Prerequisites**:	CPH-442

Course Description

This course is designed to provide the pharmacy students with fundamental knowledge in therapeutics and treatment protocols that should provide better patient care. This course will focus on cardiovascular diseases, coagulation disorders, oncology, and women's health.

Topics

- Cardiovascular diseases
- Coagulation disorders
- Oncology
- Women's health

Course Information

Code:	CPH-554	**Level:**	10
Title:	Therapeutics IV	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	4+1	**Prerequisites**:	CPH-442

Course Description

This course is a continuation of Therapeutics I, II and III courses and is designed to provide students with a fundamental knowledge of common endocrine, immunologic and infectious diseases, as well as considerations and precautions in selections, dosing and monitoring of drugs used to treat commonly encountered pharmacotherapeutic problems.

Topics

- Endocrine diseases
- Immunologic diseases
- Infectious diseases
- Antimicrobial stewardship

Course Information

Code:	CPH-555	**Level:**	9
Title:	Pharmacoepidemiology & Research Methodology	**Program:**	Pharm. D
		Co-requisites:	CPH-548
Cr hr:	3+0	**Prerequisites**:	CPH-450

Course Description

Pharmacoepidemiology is the study of the uses and effects of drugs in patient populations. The science of pharmacoepidemiology borrows from pharmacology and epidemiology. This course will introduce students to the field of pharmacoepidemiology including study methodology, relevant statistics, data sources, measurement of treatments and outcomes, sources of bias and control of confounding, techniques to reduce bias and confounding, survival analysis and regression techniques, interpretation of results, and drug safety surveillance and risk management.

Topics

- Introduction and the concepts of pharmacoepidemiology
- Outcome measurements in pharmacoepidemiology
- Study designs
- Drug safety & spontaneous adverse drug reaction or adverse drug event reporting system
- Drug utilization review
- Source of data and databases in pharmacoepidemiology
- Introduction to research
- Introduction to qualitative and quantitative research
- Survey design and the use of questionnaires
- Data collection
- Ethical requirement in research
- Statistical analysis
- Graphic methods
- Inferential statistics
- Basics of hypothesis testing
- Introduction and basics of statistical software

Course Information

Code:	CPH-556	**Level:**	9
Title:	Self-Care and Nonprescription Drugs	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	2+0	**Prerequisites**:	CPH-442

Course Description

This course is designed to build and enhance student knowledge and skills necessary for contemporary and future pharmacy practice in the area of self-care and minor ailments. This course will familiarize pharmacy students with available nonprescription drug products with a comprehensive understanding of nonprescription and prescription therapeutics as they relate to patient self-medication and minor ailments. Emphasis will be placed on the role and responsibility of the student pharmacist in accurately assessing and triaging patients, determining the appropriate use of nonprescription and prescription drugs, by determining when to follow-up, refer, and how to document the patient's care.

Topics

- Orientation and introduction to self-care and nonprescription pharmacotherapy
- Patient assessment and consultation & legal and regulatory issues in self-care pharmacy practice
- Headache
- Musculoskeletal injuries and disorders
- Colds, allergy, and cough
- Heartburn, dyspepsia, constipation, and diarrhea
- Overweight and obesity
- Smoking cessations
- Insomnia
- Skin problems
- Hair loss
- Women's health
- Anorectal disorders
- Oral pain and discomfort
- Natural products and common complementary and alternative medicine health system

Course Information

Code:	CPH-557	**Level:**	10
Title:	Pharmacy Regulations and Ethics	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	1+0	**Prerequisites**:	CPH-450

Course Description

This course is designed to build student knowledge and skills necessary for contemporary and future pharmacy practice in the area of governmental laws, regulations, detailed laws that govern and affect the practice of pharmacy such as drugs, narcotics and medical devices.

Topics

- Requirements for opening a pharmacy
- Regulations of pharmaceutical manufacturing companies and their scientific offices registration of pharmaceutical companies and their products
- List of poisonous and controlled and psychiatric substances
- Ministry of interior declaration
- Emergency medicines list
- Drugs and herbs allowed in supermarkets, perfume shops and spice dealers
- Retribution regulations
- Professional ethics
- Observance of professional standards
- Guidelines for advertising in pharmacy practice
- Guide to good dispensing practice
- Pricing prescription
- Unsatisfactory conduct
- Ethics of pharmacy practice in Islamic history

Course Information

Code:	CPH-558	**Level:**	10
Title:	Professional Pharmacy Practice Laboratory III	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	2+1	**Prerequisites**:	CPH-451

Course Description

This course is the third in a series of three professional pharmacy practice laboratories to enable the students incorporate knowledge and skills to practical situations required for providing pharmaceutical care It aims to teach the needed pharmacist skills such as history taking, documentation, pharmaceutical care planning, and communication with patients and health care professionals, and patient interviewing and counseling. It also focuses on skills such as retrieving data from patient records and interpreting laboratory investigations. Additional important aspects covered in this course are care given to special populations and how to plan and initiate a clinical pharmacy service in a hospital. Furthermore, it highlights the concept of medication reconciliation, medication safety and pharmacovigilance.

Topics

- Patient data retrieval
- History taking
- Lab investigations interpretation
- Pharmaceutical devices
- Pharmaceutical care: women's health
- Pharmaceutical care: pediatrics and geriatric patients
- Long-term care
- Palliative care
- Initiating clinical pharmacy service
- Pharmacovigilance
- Medication safety
- Medication reconciliation
- Drug information centers
- International pharmacy practice
- Healthcare systems

Course Information

Code:	CPH-559	**Level:**	10
Title:	First Aid and Emergency Medicine	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	0+1	**Prerequisites**:	CPH-452

Course Description

This course is designed to teach and train the students the basics of first aid skills necessary to become a responder in pharmaceutical care environment for emergencies, such as adult CPR with AED, choking, and shock.

Topics

- Referral skills and medication history taking
- Wound dressings
- Spinal injury and head injuries
- Management of patient in coma
- Management of bleeding
- Drowning
- Animal bites and insect stings
- Burns
- Cardiopulmonary resuscitation
- General concepts in triage management
- Management of shock, allergies, and anaphylaxis

Course Information

Code:	CPH-560	**Level:**	10
Title:	Pharm. D Seminar	**Program:**	Pharm. D
		Co-requisites:	None
Cr hr:	0+1	**Prerequisites**:	CPH-555

Course Description

This course will prepare students for professional pharmacy practice through studying how to deliver a good oral presentation when delivering a scientific speech or presenting a poster or a paper in conferences. The importance of good writing skills in the profession and the techniques required to overcome the common interviewing and presentation mistakes are also discussed in this course. It will also give practical experience on participating in journal club, writing of scientific proposals and theses defense.

Topics

- Introduction
- Pharmacy practice profession requirements
- National and international boards of pharmacy
- Types of presentations
- Publication and peer-review articles
- Presentation skills
- Journal club
- Student self-assessment and peer assessment
- Student presentations