Academic Program and Course Description for the College of Pharmacy Academic Year 2025–2026

Academic Program Description Form

University Name: Al-Farabi university

Faculty/Institute: Pharmacy college

Scientific Department: .NON

Academic or Professional Program Name: Bachelor of pharmacy

Final Certificate Name: Bachelor of pharmacy

Academic System: Seasonal

Description

Preparation Date:1/9/2025

File Completion Date:5/1/2026

Signature:
Head of Department Name:

Date:

Signature:
Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

1.vision

To achieve leadership and institutional excellence in pharmaceutical education, scientific research, and community service, while building a rigorous academic environment that keeps pace with global scientific developments and upholds national and international quality and accreditation standards.

2. Mission

The college is committed to preparing pharmacists who are academically and professionally qualified, possessing specialized competence, practical skills, and ethical values — through accredited academic programs grounded in modern learning and scientific research — in a manner consistent with labor market needs and the requirements of sustainable development.

.3.Goals

- Enhancing the quality of pharmaceutical education by updating curricula in line with modern academic standards, and ensuring their alignment with labor market requirements and national program accreditation criteria.
- **2**
- Consolidating a quality assurance and continuous improvement system through the application of institutional accreditation standards, activating self-evaluation mechanisms, and conducting periodic reviews of academic and administrative performance.
- **3**
- Supporting applied scientific research and directing it toward addressing health and societal challenges, encouraging publication in reputable journals, and linking research to national development plans.
- **4**

- Promoting good governance and effective management through organizational clarity, defined authorities and responsibilities, and data-driven decision making.
- **5**
- Developing human resources by building the capacities of faculty members and administrative staff through continuous training and participation in scientific conferences and events.
- **6**
- Developing local and international partnerships with universities, research institutions, and the industrial sector — particularly pharmaceutical companies and laboratories — to strengthen practical training and knowledge transfer.
- **7**
- Serving the community and responding to its needs through the provision of scientific consultations and health awareness activities.
- **8**
- Achieving financial sustainability and diversifying funding sources to support strategic plans and ensure the continuity of institutional development.

4.Acriditation program
NA

5.Extrenal influences
Academic Twinning with the College of Pharmacy, Al-Mustansiriyah University.

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	12	17	12%	
College Requirements	17	56	38%	
Department Requirements	33	73	50%	
Summer Training	2			
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
First year Course One			theoretical	practical
		Human biology	2	2
		Principles of Pharmacy Practice	2	----
		Analytical Chemistry	3	2
		Medical Terminology	1	----
		Mathematics and Biostatistics	3	----
		Computer Sciences	----	2
		English Language	2	----
		Democracy and Human Rights	2	----
First year Course two		Human Anatomy	1	2
		Pharmaceutical Calculations	2	2
		Medical Physics	2	2
		Organic Chemistry I	3	2
		Histology	2	2
		Computer Sciences	----	2
Second year Course One		Organic Chemistry II	3	2
		Medical Microbiology I	3	2
		Physical Pharmacy I	3	2

		Physiology I	3	2
		Democracy	1	---
		Computer Sciences	----	2
		Crimes of Ba'ath Regime in Iraq	2	----
second year Course Two		Organic Chemistry III	2	2
		Medical Microbiology II	3	2
		Physical Pharmacy II	3	2
		Physiology II	3	2
		Pharmacognosy I	3	2
		Computer Sciences	----	2
		Arabic Language	2	-----
Third year Course one		Inorganic Pharmaceutical Chemistry	2	2
		Pharmacognosy II	2	2
		Pharmaceutical Technology I	3	2
		Biochemistry I	3	2
		Pathophysiology	3	2
Third year Course two		Organic Pharm. Chemistry I	3	2
		Pharmacology I	3	----
		Pharm. Technology II	3	2
		Biochemistry II	3	2
		Pharmacognosy III	2	2
		Pharmacy Ethics	1	----
Fourth year Course one		Pharmacology II	3	2
		Organic Pharm. Chemistry II	3	2
		Clinical Pharmacy I	2	2
		Biopharmaceutics	2	2
		Public Health	2	----
		English Language	1	----
Fourth stage course Two		Pharmacology III	2	----
		Organic Pharm. Chemistry III	3	2
		Clinical Pharmacy II	2	2
		General Toxicology	2	2
		Industrial Pharmacy I	3	2
		Communication Skills	2	----

		English Language	1	----
Fifth stage Course I		Organic Pharm. Chemistry IV	2	----
		Industrial Pharmacy II	3	2
		Applied Therapeutics- I	3	-----
		Clinical Chemistry	3	2
		Clinical Laboratory Training	----	4
		Clinical Toxicology	2	2
		Graduation project	1	----
Fifth stage course Two		Pharmacoeconomic	2	----
		Applied Therapeutics- II	2	----
		Therapeutic Drug Monitoring (TDM)	2	2
		Advanced Pharmaceutical Analysis	3	2
		Hospital Training	----	4
		Dosage Form Design	2	----
		Pharmaceutical Biotechnology	1	----

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	1 Recognizing the normal functions of the body and the changes in these functions that accompany the disease 2. Identifying the drug as a chemical compound and the consequences of its properties in terms of the drug's effectiveness and its chemical nature, Its action, methods of formulation, and side effects. 3. Identify the types of medicinal dosages and how to determine the appropriate medicinal formula for the medication, and methods for classifying it. It was examined and evaluated in terms of effectiveness, therapeutic effect, calculate the correct doses and stability. 4. Learn about the different treatments and how to choose the appropriate treatment according to the disease condition. 5. Getting to know the concepts of human rights and citizenship. 6. Learn about the principles of medical statistics and medical physics.
Skills	

Learning Outcomes 2	1 The student acquires the skill of dealing with laboratory equipment 2. The student acquires the skill of self-learning. 3. The pharmacist can provide the highest level of health care to patients, whether in health institutions or Life and community 4. The pharmacist must be able to diagnose medicinal errors in terms of the appropriateness of the treatment for the condition, beside their abilities to find out drug interactions or interactions with the patient's general health condition. 5. The pharmacist is able to deal with patients of various intellectual, scientific and social levels. 6. The pharmacist can communicate with various medical personnel, such as the doctor, nurse, and others, to rectify treatment errors, if any, and provide treatment recommendations based on sound foundations. 7. The pharmacist is able to apply the basic concepts of drug chemistry and its mechanism of action in interpreting the interventions the pharmaceutical intervention and providing pharmaceutical consultation to medical staff and the community.

	8. The pharmacist is able to play the role of teaching the patient about the aspects of using the medicinal dose and how to store the medicine.
Ethics	
Learning Outcomes 4	1 Dealing with patients according to the ethics of the pharmacy profession 2. Putting the safety and security of the patient as the first priority. 3. Dealing in a team spirit with other colleagues within the health care team.

\

9. Teaching and Learning Strategies

- Presentation and delivery
- Interactive discussions
- Brainstorming
- Small groups
- Research and induction
- Panel discussions
- Field visits to institutions and entities related to the pharmacist's work

10. Evaluation methods

- Individual and group duties and reports
- Daily exams
- Assess practical skills
- Mid-semester and end-of-semester exams
- Graduation projects

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
	Pharmacy	Pharmacology			1	4
	Pharmacy	Toxicology			1	4
	Pharmacy	Pharmaceuticals			1	3
	Pharmacy	Pharmacognosy			1	2
	Pharmacy	Chemistry			1	5
	Medical	Terminology			0	1
	Clinical	Clinical pharmacy				2
	Language	Arabic Englsih				4
	Science	Computer science				2

Professional Development

Mentoring new faculty members

The mentor (usually PhD.) make a field visit with the new members whether to the laboratory or to the teaching halls to make them familiar with equipment's and facilities beside one to one sessions include briefing of the curriculum topics and the main assessing ways of our students.

Professional development of faculty members

The academic program includes workshops, seminars, and discussion panels that focus on aspects of general societal behavior and educational behavior in a general way.

The academic program includes special seminars in which members present cutting age scientific topics.

12. **Acceptance Criterion**
Academic grade point average and physical health as reported by the Ministry of Higher Education and Scientific Research

13. **The most important sources of information about the program**
The website of the Department of Pharmacy, Al-Farabi University College, in Arabic and English. Al-Farabi University College website The website of the Ministry of Higher Education and Scientific Research The page of the Department of Pharmacy, Al-Farabi University College, on social networking sites Plates installed in the department's corridors

14. Program Development Plan
To analyze existing programs, based on quantitative and qualitative indicators, relative to their competitive strength and position in the marketplace.

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
First year		Human biology				\		\		\		\	\		
		Principle of pharmacy				\		\		\		\	\		
		Analytical chemistry				\		\			\		\		
		Medical teminology				\		\			\		\		
		Mathmatics and biostatistics				\	\	\			\		\	\	
		Computer sciences				\	\	\			\		\	\	
		English				\	\	\			\		\		
		Anatomy				\		\			\		\		
		Pharmaceutical calculations			\	\		\			\		\	\	
		Medical physics			\	\	\	\			\		\		\

		Organics chemistry I			\			\	\	\			\		
		Hisology		\					\	\				\	
		Human rights					\		\	\		\	\	\	\
		Computer science II					\		\	\			\		
Second stage		**Organics chemistry II**			\			\	\	\			\		
		Microbiology I		\			\		\	\			\		
		Physical pharmacy I			\	\		\	\	\	\		\		\
		Physiology I		\					\	\			\		
		Democracy					\		\	\		\	\		
		Computer science III					\		\	\			\		
		Biosafety and security			\			\	\	\			\	\	\
		Organic chemisrty III			\			\	\	\			\		
		Microbiology II		\			\	\	\	\			\	\	
		Physical pharmacy II			\	\		\	\	\			\		
		Physiology II			\	\		\	\	\			\		

		Pharamcognosy I			\			\	\	\	\		\		
		Computer science IV					\		\	\			\		
Third stage		**Inorganic pharmaceutical chemistry**			\			\	\	\			\		
		Pharmacognosy II			\				\	\			\		
		Pharmaceutical technology I				\		\	\	\		\	\	\	
		Biochemistry I		\				\	\	\			\		
		Pathophysiology		\				\	\	\			\		
		Englsih V							\	\			\		\
		Organic chemistry I			\			\	\	\			\		
		Pharmacology I			\		\	\	\	\			\		\
		Pharmaceutical technology II				\			\	\		\	\		
		Biochemistry II		\				\	\	\			\	\	

Fifth stage		**Organic pharamceutical chemistry IV**			\			\	\	\			\		
		Applied therapeutics					\	\	\	\			\		\
		Industrial pharmacy			\	\		\	\				\		
		Clinical chemistry		\					\	\			\		
		Clinical laboratory training		\					\	\		\	\	\	\
		Clinical toxicology			\		\		\	\			\		
		Drug economy					\		\	\			\		
		Applied therapeutics II					\		\	\	\		\	\	
		Drug therapeutics monitoring				\			\	\	\		\	\	\
		Advanced pharmaceutical analysis			\			\	\	\			\	\	
		Hospital training					\		\	\			\		

		Dosage form design			\	\			\	\			\		
		Pharmaceutical biotechnology			\	\			\	\			\		

Republic of Iraq
Al-Farabi University College of Pharmacy

Course Description Form

1. Course Name:	Medical Microbiology II / Practical
2. Course Code:	Not provided
3. Semester / Year:	Year 2 / Semester 2
4. Description Preparation Date:	3/1/2026
5. Available Attendance Forms:	Practical laboratory attendance
6. Credit Hours / Units:	3 credits total (2 theory + 1 practical)
7. Course Administrator:	Dr.Mustafa Aedan

8. Course Objectives

1. Provide information about parasitic and viral diseases affecting human health, their causes, vectors, and methods of detection, treatment, and control.
2. Provide information about fungi causing systemic diseases and methods of detection, treatment, and control.

9. Teaching and Learning Strategies

- Practical laboratory sessions
- Demonstrations
- Microscopy
- Specimen identification
- Guided discussion

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Subject Name	Learning Method	Evaluation Method
1	2	Identify and understand morphology, diagnosis, and significance	Introduction and classification of human parasites	Practical Lab	Lab assessment
2	2	Identify and understand morphology, diagnosis, and significance	Entamoeba histolytica	Practical Lab	Lab assessment
3	2	Identify and understand morphology, diagnosis, and significance	Entamoeba coli	Practical Lab	Lab assessment

4	2	Identify and understand morphology, diagnosis, and significance	Giardia lamblia	Practical Lab	Lab assessment
5	2	Identify and understand morphology, diagnosis, and significance	Leishmania spp.	Practical Lab	Lab assessment
6	2	Identify and understand morphology, diagnosis, and significance	Plasmodium spp.	Practical Lab	Lab assessment
7	2	Identify and understand morphology, diagnosis, and significance	Toxoplasma gondii	Practical Lab	Lab assessment
8	2	Identify and understand morphology, diagnosis, and significance	Taenia spp.	Practical Lab	Lab assessment
9	2	Identify and understand morphology, diagnosis, and significance	Hymenolepis spp.	Practical Lab	Lab assessment
10	2	Identify and understand morphology, diagnosis, and significance	Echinococcus spp.	Practical Lab	Lab assessment
11	2	Identify and understand morphology, diagnosis, and significance	Schistosoma spp.	Practical Lab	Lab assessment
12	2	Identify and understand morphology, diagnosis, and significance	Enterobius vermicularis	Practical Lab	Lab assessment
13	2	Identify and understand morphology, diagnosis, and significance	Ascaris lumbricoides	Practical Lab	Lab assessment
14	2	Identify and understand morphology, diagnosis, and significance	Ancylostoma duodenale	Practical Lab	Lab assessment
15	2	Identify and understand morphology, diagnosis, and significance	Methods for diagnosis of fungal infections	Practical Lab	Lab assessment

11. Course Evaluation

- Practical exams
- Quizzes
- Reports
- Attendance
- Participation

12. Learning and Teaching Resources

- Medical Parasitology, 5th ed. (2018), D.R. Arora & Brij Bala Arora
- Lab Manual for Practical Virology and Parasitology
- Atlas of Helminthes and Protozoa
- Scientific journals and reports in microbiology, parasitology, virology, and mycology
- Relevant university e-learning resources and academic websites

Republic of Iraq
Al-Farabi University College of Pharmacy

Course Description Form

1. Course Name:	Medical Microbiology I
2. Course Code:	Not provided
3. Semester / Year:	1st Semester / 2025-2026
4. Description Preparation Date:	1/9/2025
5. Available Attendance Forms:	Announce students name and record on excel sheet
6. Credit Hours / Units:	45 hours theoretical lectures / 15 weeks / 4 units
7. Course Administrator:	Lec. Dr. Niran Abdul Hussain Email: neran.abdulhusain@alfarabiuc.edu.iq

8. Course Objectives

1. Understanding bacteria in terms of their presence in the environment and their nutritional requirements for growth and reproduction.
2. Methods of transmission of bacteria and the diseases they cause.
3. Treatments and resistance to antibiotics and environmental factors.

9. Teaching and Learning Strategies

- Lectures
- Homework
- Quiz
- Mid Exam
- Final Exam

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Subject Name	Learning Method	Evaluation Method
1	1	Introduction to microbiology	Introduction to microbiology	Lecture	Teacher-Student interaction
1	1	Bacterial classification and structure	Bacterial classification and structure	Lecture	Teacher-Student interaction
2	2	Bacterial pathogenicity	Bacterial pathogenicity	Lecture	Paper-based exam + Quiz
3	2	Bacterial genetic	Bacterial genetic	Lecture	Teacher-Student interaction
4	2	Bacterial growth physiology and biofilm	Bacterial growth physiology and biofilm	Lecture	Teacher-Student interaction
4	2	Normal Flora	Normal Flora	Lecture	Comprehensive questions
5	1	Antimicrobial resistance	Antimicrobial resistance	Lecture	Paper-based exam + Quiz
5	2	Gram positive: Staphylococcus	Gram positive: Staphylococcus	Lecture	Interactive discussion
6	2	Gram positive: Streptococcus	Gram positive: Streptococcus	Lecture	Oral assessment
6	1	Gram positive: Bacillus	Gram positive: Bacillus	Lecture	Teacher-Student interaction + Mid Exam
7	3	Gram positive: Clostridium	Gram positive: Clostridium	Lecture	Interactive discussion
8	1	Gram-positive: Corynebacterium	Gram-positive: Corynebacterium	Lecture	Interactive discussion
8	1	Gram negative: Neisseria	Gram negative: Neisseria	Lecture	Oral assessment
8	2	Gram negative: Enterobacter E. coli	Gram negative: Enterobacter E. coli	Lecture	Oral assessment
9	2	Gram negative: Salmonella and Shigella	Gram negative: Salmonella and Shigella	Lecture	Paper-based exam + Quiz

10	2	Gram negative: Klebsiella and Proteus	Gram negative: Klebsiella and Proteus	Lecture	Interactive discussion
10	2	Non-enteric Pseudomonas and Vibrio	Non-enteric Pseudomonas and Vibrio	Lecture	Interactive discussion
11	2	Brucella, Bordetella and Hemophilus	Brucella, Bordetella and Hemophilus	Lecture	Interactive discussion
11	2	H. pylori and Campylobacter	H. pylori and Campylobacter	Lecture	Interactive discussion + Homework
12	3	Treponema, Yersinia and Actinomycetes	Treponema, Yersinia and Actinomycetes	Lecture	Interactive discussion
13	2	Mycobacteria	Mycobacteria	Lecture	Interactive discussion
14	2	Antimicrobial stewardship	Antimicrobial stewardship	Lecture	Interactive discussion
15	2	Recombinant biotechnology	Recombinant biotechnology	Lecture	Interactive discussion
15	1	Phage and toxins	Phage and toxins	Lecture	Interactive discussion
Final	-	Comprehensive assessment	Final Exam	Paper-Based Exam	Final Exam

11. Course Evaluation

- 20 marks (midterm + quizzes + attendance)
- 20 marks (written exams of practical part + attendance)
- 60 marks (final exam)
- 100 marks total

12. Learning and Teaching Resources

- Lippincott's Illustrated Reviews: Microbiology, 2nd ed.
- Jawetz, Melnick, & Adelberg's Medical Microbiology, 26th ed.
- A Color Atlas of Microbiology by Ronald John Olds
- Scientific journals and reports in microbiology, parasitology, virology, and mycology
- Relevant university e-learning resources and academic websites

Republic of Iraq
Al-Farabi University College of Pharmacy

Course Description Form

1. Course Name:	Computer Sciences I
2. Course Code:	Not provided
3. Semester / Year:	2nd Semester / 2025-2026
4. Description Preparation Date:	1/11/2025
5. Available Attendance Forms:	Students' signature on attendance sheet
6. Credit Hours / Units:	2 credits / 45 hours theoretical lectures / 15 weeks / 3 units
7. Course Administrator:	Lubna Mohammed Jamal Jasim

8. Course Objectives

1. Provide a thorough overview of the fundamental concepts of computer applications.
2. The course covers the use of Microsoft Word, Microsoft PowerPoint, and Google applications in detail.

9. Teaching and Learning Strategies

- Lectures
- Practice on computer
- Quizzes

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Subject Name	Learning Method	Evaluation Method
1	1	Knowing how to use Word	Introduction to Microsoft Word (File and Home Tab)	Lecture	Oral evaluation
2	1	Knowing how to use Word	Insert Tab	Lecture	Oral evaluation
3	1	Knowing how to use Word	Layout Tab	Lecture	Quiz
4	1	Knowing how to use Word	References Tab	Lecture	Oral evaluation
5	1	Knowing how to use Word	Mailings Tab	Lecture	Oral evaluation
6	1	Knowing how to use Word	Review Tab	Lecture	Quiz
7	2	Knowing how to use Word	View Tab	Lecture	Oral evaluation

8	1	Knowing how to use PowerPoint	Introduction to Microsoft PowerPoint	Lecture	Oral evaluation
9	1	Knowing how to use PowerPoint	File and Home Tab	Lecture	Oral evaluation
10	1	Knowing how to use PowerPoint	Insert Tab	Lecture	Oral evaluation
11	1	Knowing how to use PowerPoint	Design Tab	Lecture	Oral evaluation
12	1	Knowing how to use PowerPoint	Transition Tab, Slide View	Lecture	Oral evaluation
13	2	Knowing how to use PowerPoint	Animation Tab, Review Tab, View Tab	Lecture	Oral evaluation
14	1	Knowing how to use Word	Introduction to Microsoft Word (File and Home Tab)	Lecture	Oral evaluation
15	1	Knowing how to use Word	Introduction to Microsoft Word (File and Home Tab)	Lecture	Quiz
Final	-	Comprehensive assessment	Final Exam	-	Final Exam

11. Course Evaluation

- Quiz: 10 Marks
- Quiz: 10 Marks
- Quiz: 5 Marks
- Attendance: 5 Marks
- Final Exam: 70 Marks

12. Learning and Teaching Resources

- Microsoft Office Professional 2019 by Linda Foulkes
- Microsoft Office Professional by Joyce Cox, Joan Lambert, Curtis Frye

Republic of Iraq
Al-Farabi University College of Pharmacy

Course Description Form

1. Course Name:	Democracy & Human Rights
2. Course Code:	Not provided
3. Semester / Year:	1st Semester / 2025-2026
4. Description Preparation Date:	1/11/2025
5. Available Attendance Forms:	Students' signature on attendance sheet
6. Credit Hours / Units:	2 credits
7. Course Administrator:	Lubna Mohammed Jamal Jasim

8. Course Objectives

1. Define human rights, their characteristics, sources, and historical stages.
2. Understand how to practice political rights.
3. Understand the Universal Declaration of Human Rights and international conventions that stipulate human rights.

9. Teaching and Learning Strategies

- Lectures
- Quizzes

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Subject Name	Learning Method	Evaluation Method
1	2	Definition of democracy	Definition of democracy	Lecture	Oral evaluation
2	2	Origin of democracy and different concepts	Origin of democracy and different concepts	Lecture	Oral evaluation
3	2	Characteristics of democracy	Characteristics of democracy	Lecture	Quiz
4	2	Conditions and pillars of democracy	Conditions and pillars of democracy	Lecture	Oral evaluation
5	2	Types of democracy: democracy in Islam	Types of democracy: democracy in Islam	Lecture	Oral evaluation
6	2	Meaning of democracy	Meaning of democracy	Lecture	Quiz

7	2	Characteristics of democratic system and pros/cons	Characteristics of democratic system and pros/cons	Lecture	Oral evaluation
8	2	Common principles between democratic systems	Common principles between democratic systems	Lecture	Oral evaluation
9	2	Civil and political rights	Civil and political rights	Lecture	Oral evaluation
10	2	Types of human rights in international law	Types of human rights in international law	Lecture	Oral evaluation
11	2	Types of human rights in international law	Types of human rights in international law	Lecture	Oral evaluation
12	2	Universal Declaration of Human Rights	Universal Declaration of Human Rights	Lecture	Oral evaluation
13	2	Differences of rights in religions	Differences of rights in religions	Lecture	Oral evaluation
14	2	Women's and children's rights	Women's and children's rights	Lecture	Oral evaluation
15	2	Women's rights between Sharia and law	Women's rights between Sharia and law	Lecture	Quiz
Final	-	Comprehensive assessment	Final Exam	-	Final Exam

11. Course Evaluation

- Quiz: 10 Marks
- Quiz: 10 Marks
- Quiz: 5 Marks
- Attendance: 5 Marks
- Final Exam: 70 Marks

12. Learning and Teaching Resources

- The Political System by Hamid Hamed Khalaf
- Democracy from the Perspective of the World to the Afterlife by Dr. Mahmoud
- Human Rights and the Child in Democratic Thought by Dr. Mahmoud

Republic of Iraq
Al-Farabi University College of Pharmacy

Course Description Form

1. Course Name:	Physiology II
2. Course Code:	PHS-302
3. Semester / Year:	2nd Semester / 2nd Year
4. Description Preparation Date:	1/2/2026
5. Available Attendance Forms:	In-person Lectures & Laboratory Sessions
6. Credit Hours / Units:	5 Hours / 4 Units
7. Course Administrator:	Lec. Doctor Hussam Hadi Kadhum

8. Course Objectives

1. Provide comprehensive understanding of homeostatic mechanisms regulating advanced human organ systems (endocrine, cardiovascular, respiratory, renal, digestive, reproductive).
2. Enable students to analyze integrated responses of these systems to various physiological stresses and environmental changes.
3. Equip students with practical laboratory skills to measure, record, and interpret physiological data safely and accurately.
4. Develop critical clinical reasoning skills by correlating normal physiological functions with common pathophysiological states.

9. Teaching and Learning Strategies

- Interactive Lectures: Utilizing multimedia presentations, dynamic physiological animations, and active-learning concept checks
- Laboratory Experiments: Hands-on practical sessions emphasizing data collection via biopac systems, spirometry, electrocardiography, and urinalysis
- Problem-Based Learning (PBL): Small-group discussions focused on analyzing medical case studies
- Independent Study & Quizzes: Online formative assessments and reading assignments

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Subject Name	Learning Method	Evaluation Method
1	5	Differentiate between endocrine and nervous regulation; explain hormone receptor interactions	Endocrine System: Principles of Endocrinology & Pituitary Gland	Lecture & Case Study	Diagnostic Quiz

2	5	Describe synthesis, regulation, and physiological actions of thyroid, parathyroid, and adrenal hormones	Endocrine System: Thyroid, Parathyroid, and Adrenal Glands	Lecture & Concept Map	Homework Assignment 1
3	5	Explain pancreatic hormone functions, glucose homeostasis, and pathophysiology of Diabetes Mellitus	Endocrine System: Endocrine Pancreas & Metabolic Regulation	Lecture & Problem-Solving	In-class Participation
4	5	Detail composition of blood, mechanisms of hemostasis, coagulation cascades, and blood typing	Cardiovascular System: Blood Components & Hemostasis	Lecture & Lab Session	Practical Lab Report 1
5	5	Analyze mechanical and electrical events of cardiac cycle and correlate with ECG waves	Cardiovascular System: Cardiac Electrophysiology & Cycle	Lecture & ECG Lab	Written Quiz
6	5	Evaluate physical factors influencing blood flow, blood pressure regulation, and capillary dynamics	Cardiovascular System: Hemodynamics & Blood Pressure	Lecture & BP Measurement Lab	Practical Lab Report 2
7	5	Describe mechanics of breathing, lung volumes, compliance, and surfactant function	Respiratory System: Pulmonary Ventilation & Lung Mechanics	Lecture & Spirometry	Midterm Review Exercise
8	3	Demonstrate comprehensive theoretical mastery over topics covered in Weeks 1-7	Midterm Examination	Written Examination	Midterm Grade
9	5	Explain transport mechanisms of oxygen and carbon dioxide in blood and neural control of breathing	Respiratory System: Gas Exchange, Transport & Regulation	Lecture & Data Analysis	Homework Assignment 2
10	5	Outline nephron structure and evaluate mechanisms determining glomerular filtration rate (GFR)	Renal System: Renal Circulation & Glomerular Filtration	Lecture & Problem-Based Learning	Written Quiz 2
11	5	Analyze tubular reabsorption and secretion pathways alongside countercurrent multiplier mechanism	Renal System: Tubular Processing & Urine Concentration	Lecture & Urinalysis Lab	Practical Lab Report 3
12	5	Evaluate integrated renal and respiratory mechanisms maintaining systemic pH balance	Renal System: Fluid, Electrolyte, and Acid-Base Balance	Lecture & Clinical Case Study	Case Analysis Report
13	5	Describe motility, secretory functions, and neural/hormonal regulation of GI tract	Digestive System: GI Motility and Secretion	Lecture & Interactive Tutorial	In-class Q&A
14	5	Explain digestion and absorption of macronutrients and physiological roles of liver	Digestive System: Digestion, Absorption, & Liver Function	Lecture & Concept Mapping	Short Essay Assignment

15	2	Demonstrate mastery over practical clinical testing, instrumentation, and laboratory theory	Final Practical Examination & Review	Practical Assessment	Final Practical Grade

11. Course Evaluation

- Midterm Examination: 20%
- Practical & Laboratory Work: 20%
- Quizzes & Assignments: 20%
- Final Examination: 40%

12. Learning and Teaching Resources

- Guyton and Hall Textbook of Medical Physiology (Current Edition, John E. Hall, Elsevier)
- Vander's Human Physiology: The Mechanisms of Body Function (Eric Widmaier, Hershel Raff, Kevin Strang, McGraw-Hill)
- Journal of Physiology (The Physiological Society)
- Annual Review of Physiology
- Berne & Levy Physiology (Bruce M. Koeppen, Bruce A. Stanton)
- American Physiological Society (APS) - www.physiology.org
- PhysioWeb / Interactive Physiology Resources
- National Center for Biotechnology Information (NCBI) Bookshelf - PubMed

Republic of Iraq
Al-Farabi University College of Pharmacy

Course Description Form

1. Course Name:	Pharmaceutical Biotechnology
2. Course Code:	Not provided
3. Semester / Year:	Not specified
4. Description Preparation Date:	1/5/2026
5. Available Attendance Forms:	Attendance (Signature)
6. Credit Hours / Units:	15 hr theoretical / 15 weeks / 1 unit
7. Course Administrator:	Lect. Ahmed Mohammed Mahmood

8. Course Objectives

1. Introduce students to the principles and applications of pharmaceutical biotechnology.
2. Students will gain knowledge of recombinant DNA technology, the production of biopharmaceutical preparations, cell culture techniques, and downstream processing.
3. Develop students' skills in analyzing biotechnological methods used in drug discovery, vaccine development, and the production of therapeutic proteins.

9. Teaching and Learning Strategies

- Lectures
- Quizzes
- Educational videos

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Subject Name	Learning Method	Evaluation Method
1	2	Importance and Definition of Biotechnology, History of Biotechnology derived product	Biotechnology - Introduction	Lecture + Video	Oral assessment
2	2	Formulation of biotechnological product (biopharmaceutical considerations)	Recombinant DNA biotechnology	Lecture	Oral evaluation
3	2	Microbial considerations, Sterilization (chemical + physical Methods), Chemotherapy	Sterilization and Microbial Considerations	Lecture	Paper-based exam

4	2	Excipients of parenteral product: Types and specification of solubility enhancer, adsorption agents, preservatives, osmotic agents	Excipients Used in Biotechnological Formulation	Lecture	Oral questions
5	2	Types and specification of excipients used in biotechnological formulation	Excipients of Parenteral Product	Lecture	Oral assessment
6	2	Route of administration: Parenteral route, Oral route; Formulation requirements according to route	Route of Administration: Parenteral and Oral	Lecture	Comprehensive questions
7	2	Formulation requirements according to route of administration	Route of Administration	Lecture	Paper-based exam
8	2	Formulation requirements according to route of administration	Route of Administration	Lecture	Interactive discussion
9	2	Formulation requirements according to route of administration	Route of Administration	Lecture	Oral assessment
10	2	Formulation requirements according to route of administration	Route of Administration	Lecture	Paper-based exam
11	2	Alternative routes (nasal, pulmonary, rectal, buccal, transdermal)	Alternative Routes of Administration	Lecture	Interactive discussion
12	2	Formulation requirements according to route of administration	Formulation Requirements	Lecture	Interactive discussion
13	2	Pharmacokinetic of peptides and proteins, ADME and relationship to pharmacodynamics	Pharmacokinetics of Peptides and Proteins	Lecture	Oral assessment
14	2	Differentiate between viral and non-viral gene delivery methods, including advantages and limitations	Gene Delivery	Lecture	Oral assessment
15	2	Comprehensive assessment	Final Assessment	Lecture	Paper-based exam

1. Course Evaluation

- 25 Marks (midterm + quizzes)
- 5 Marks (activities + attendance)
- 70 Marks (final exam)
- 100 Marks total

1. Learning and Teaching Resources

- Not provided

Republic of Iraq
Al-Farabi University College of Pharmacy

Course Description Form

1. Course Name:	General Toxicology
2. Course Code:	TOX-301
3. Semester / Year:	Second Semester / 4th Year
4. Description Preparation Date:	1/2/2026
5. Available Attendance Forms:	In-person Lectures & Laboratory Sessions
6. Credit Hours / Units:	4 hours / 3 Units
7. Course Administrator:	Lec. Doctor Hussam Hadi Kadhum

8. Course Objectives

1. Provide foundational understanding of toxicology principles including dose-response relationships and mechanisms of toxicity.
2. Explain the toxicokinetics of xenobiotics, covering absorption, distribution, metabolism, and excretion (ADME) pathways.
3. Enable students to identify target organ toxicity and understand the adverse effects of chemicals on biological systems.
4. Introduce students to environmental, regulatory, and forensic toxicology frameworks, alongside basic toxicity testing methods.

9. Teaching and Learning Strategies

- Interactive Lectures: Utilizing multimedia presentations to explain core theoretical concepts and pathways
- Laboratory Experiments: Hands-on practical sessions focusing on toxicity assays, antidote mechanisms, and data evaluation
- Case Studies: Analysis of real-world clinical poisoning incidents or industrial/environmental contamination scenarios
- Group Discussions & Seminars: Collaborative problem-solving sessions and student-led presentations on recent toxicological literature

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Subject Name	Learning Method	Evaluation Method
1	3	Define key concepts, historical milestones, and disciplines of toxicology	Introduction to Toxicology: Scope and History	Lecture & Interactive Discussion	Diagnostic Quiz
2	3	Analyze dose-response curves, LD50, ED50, and therapeutic indexes	Principles of Toxicology & Dose-Response	Lecture & Problem-Solving	Homework Assignment 1

3	3	Explain mechanisms of toxicant entry across biological membranes	Absorption of Toxicants	Lecture & Case Studies	In-class Q&A Participation
4	3	Describe toxicant translocation, plasma protein binding, storage, and excretion	Distribution and Excretion of Toxicants	Lecture & Concept Mapping	Written Quiz 1
5	3	Detail Phase I biotransformation pathways (oxidation, reduction, hydrolysis)	Metabolism of Xenobiotics: Phase I Reactions	Lecture & Lab Demonstration	Practical Lab Report 1
6	3	Detail Phase II conjugation pathways (glucuronidation, sulfation, methylation)	Metabolism of Xenobiotics: Phase II Reactions	Lecture & Practical Lab Work	Practical Lab Report 2
7	3	Understand cellular targets, oxidative stress, and lipid peroxidation	Mechanisms of Toxicity & Cellular Injury	Lecture & Group Discussion	Midterm Review Exercise
8	2	Synthesize and evaluate core knowledge gained in Weeks 1-7	Midterm Examination	Written Examination	Midterm Grade
9	3	Evaluate physiological susceptibility and toxic response of liver and kidneys	Target Organ Toxicity: Hepatotoxicity & Nephrotoxicity	Lecture & Clinical Case Study	Case Analysis Report
10	3	Evaluate toxicant actions on central nervous and respiratory systems	Target Organ Toxicity: Neurotoxicity & Pulmonotoxicity	Lecture & Practical Lab Work	Practical Lab Report 3
11	3	Identify sources, mechanisms, clinical signs, and antidotes for heavy metals	Toxic Agents: Heavy Metals (Lead, Mercury, Arsenic)	Lecture & Seminar	Student Presentation
12	3	Examine exposure and toxic effects of pesticides, organic solvents, and toxic gases	Environmental and Industrial Toxicology	Lecture & Group Workshop	Written Quiz 2
13	3	Differentiate between DNA damage, mutagens, and chemical carcinogens	Genetic Toxicology and Carcinogenesis	Lecture & Literature Review	Homework Assignment 2
14	3	Apply risk assessment principles (hazard ID, exposure assessment) to toxicological data	Risk Assessment & Regulatory Toxicology	Workshop / Group Exercise	Project Submission
15	2	Demonstrate mastery over practical laboratory techniques and theory	Final Practical Examination & Review	Practical Assessment	Final Practical Grade

11. Course Evaluation

- Midterm Examination: 15%
- Practical & Laboratory Work: 20%
- Quizzes & Assignments: 5%
- Final Examination: 60%

12. Learning and Teaching Resources

- Casarett & Doull's Toxicology: The Basic Science of Poisons (Current Edition, Curtis D. Klaassen)
- Principles of Toxicology by Karen E. Stein and Thomas M. Brown (CRC Press)
- Toxicological Sciences (Official Journal of the Society of Toxicology)
- Trends in Pharmacological Sciences
- Agency for Toxic Substances and Disease Registry (ATSDR)
- Society of Toxicology (SOT) - www.toxicology.org
- WHO International Programme on Chemical Safety (IPCS)

Republic of Iraq
Al-Farabi University College of Pharmacy

Course Description Form

1. Course Name:	Physiology I
2. Course Code:	Not provided
3. Semester / Year:	2nd Semester / 2025-2026
4. Description Preparation Date:	1/3/2026
5. Available Attendance Forms:	Students' signature on attendance sheet
6. Credit Hours / Units:	3 hours theoretical lec. / 15 weeks / 3 units / Total 45 hrs
7. Course Administrator:	Lec. Basman Qasim Shareef Email: Basiman.qasim@alfarabiuc.edu.iq

8. Course Objectives

1. Learn the principles of human physiology and how the body is organized.
2. Learn the cell structure, functions, and signaling.
3. Learn how the nervous system works.

9. Teaching and Learning Strategies

- Lectures
- Quizzes
- Brainstorming questions

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Subject Name	Learning Method	Evaluation Method
1	3	How is the body organized; Hierarchy of Organization; Internal vs. External Environments; Homeostatic Principles	Introduction to Physiology I	PowerPoint presentation + lecture	Class participation
2	3	Feedback Loop Components; Negative vs. Positive Feedback; Compartmentalization and Membranes; Communication and Integration; Levels of biological	Introduction to Physiology II + Homeostasis I	PowerPoint presentation + lecture	Class participation + homework

		organization; Composition of body fluid			
3	3	Compartments; Concept of Homeostasis; Essential components of reflex arc; Intercellular Communication and Local Responses; Adaptation, Acclimatization, Circadian Rhythms	Homeostasis I	PowerPoint presentation + lecture	Class participation + homework
3	-	Assessment	Quiz	Paper-based	Quiz
4	3	Principles of Total-Body Chemical Balance; Negative and positive feedback mechanisms; Na+/K+-ATPase pump; Membrane potential; Eukaryotic vs. Prokaryotic Cell Structures; Specialized Roles of Membrane-Bound Organelles	Homeostasis II + Cellular Structure, Protein, and Metabolic Pathways I	PowerPoint presentation + lecture	Class participation
5	3	Genetic Regulatory Mechanisms of Nucleus; Protein Synthesis and Post-Translational Modification; Four Levels of Structural Hierarchy; Bioenergetics of Mitochondrial ATP Production	Cellular Structure, Protein, and Metabolic Pathways I + II	PowerPoint presentation + lecture	Class participation + homework
6	3	Metabolic Profiles of Catabolic and Anabolic Pathways; Kinetic Principles of Enzymatic Catalysis; Citric Acid Cycle and Glycolysis	Cellular Structure, Protein, and Metabolic Pathways II + III	PowerPoint presentation + lecture	Class participation + homework
7	3	Physiological Impact of Molecular Transport; Biophysics of Lipid Bilayer; Rules of Membrane Permeability	Cellular Structure, Protein, and Metabolic Pathways III + Movement of Molecules I	PowerPoint presentation + lecture	Class participation + homework
7	-	Assessment	Midterm Exam	Paper-based	Midterm
8	3	Passive Transport Mechanisms; Dynamics of Carrier Proteins; Primary Active Transport	Movement of Molecules across Cell Membranes I + II	PowerPoint presentation + lecture	Class participation
9	3	Secondary Active Transport; Vesicular Bulk Transport; Principles of Osmosis and Tonicity; Clinical Applications of IV Fluids	Movement of Molecules across Cell Membranes II + III	PowerPoint presentation + lecture	Class participation + homework
10	3	Albumin Paradox; Plasma Membrane vs. Intracellular Receptors; Receptor Specificity and Affinity; Impact of Agonists and Antagonists	Movement of Molecules III + Cell Signaling in Physiology I	PowerPoint presentation + lecture	Class participation + homework

11	3	Up-regulation and Down-regulation; Signal Transduction for Lipid-Soluble Messengers; Ligand-Gated Ion Channels; Tyrosine Kinase and Janus Kinase Pathways	Cell Signaling in Physiology I + II	PowerPoint presentation + lecture	Class participation
11	-	Assessment	Quiz	Paper-based	Quiz
12	3	Function and Subunits of G Protein-Coupled Receptors; Second Messengers (cAMP, cGMP); Termination of Signal Transduction; Functional classes of neurons; Primary structural components of neuron	Cell Signaling in Physiology II + Neuronal Signaling and Nervous System I	PowerPoint presentation + lecture	Class participation + homework
13	3	Anterograde and retrograde axonal transport; Glial cells; Signal integration; Resting membrane potential; Na+-K+ pump	Neuronal Signaling and Nervous System I + II	PowerPoint presentation + lecture	Class participation + homework
14	3	Action potential; Excitable tissues; Sensory receptors; Sensory transduction; Receptor adaptation	Neuronal Signaling and Nervous System II + Sensory Physiology	PowerPoint presentation + lecture	Class participation + homework
15	3	Receptive fields and lateral inhibition; Ascending neural pathways; Somato sensation; Photoreception; Auditory transduction; Chemical senses; Integration of sensory inputs	Sensory Physiology	PowerPoint presentation + lecture	Class participation + homework
Final	-	Comprehensive assessment	Final Exam	Paper-based	Final Exam

11. Course Evaluation

- 20 marks (theoretical midterm exam)
- 20 marks (practical assessment)
- 60 marks (final exam)

12. Learning and Teaching Resources

- Vander's Human Physiology: The Mechanisms of Body Function (Eric P. Widmaier, Hershel Raff, Kevin T. Strang, last edition)

Republic of Iraq
Al-Farabi University College of Pharmacy

Course Description Form

1. Course Name:	Medical Terminology
2. Course Code:	Not provided
3. Semester / Year:	1st Semester / 2025-2026
4. Description Preparation Date:	22/10/2025
5. Available Attendance Forms:	Students' signature on attendance sheet
6. Credit Hours / Units:	15 hours theoretical lec. / 15 weeks / 1 unit
7. Course Administrator:	Lec. Basman Qasim Shareef Email: Basiman.qasim@alfarabiuc.edu.iq

8. Course Objectives

1. Learn how to pronounce, spell, and define pharmaceutical and medical terminology used in healthcare settings.
2. Employ word-building techniques to assist in identifying relationships and connections between word roots, prefixes, and suffixes.
3. Complete medical and pharmaceutical terminology used in healthcare settings.

9. Teaching and Learning Strategies

- Lectures
- Quizzes
- Brainstorming questions

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Subject Name	Learning Method	Evaluation Method
1-15	1	Comprehensive study of medical terminology components	Medical Terminology (Word Roots, Prefixes, Suffixes)	Lecture	Quizzes and Final Exam

11. Course Evaluation

- Not fully detailed in source document

12. Learning and Teaching Resources

- Not fully detailed in source document

Republic of Iraq
Al-Farabi University College of Pharmacy

Course Description Form

1. Course Name:	Organic Pharmaceutical Chemistry I Lab
2. Course Code:	Not provided
3. Semester / Year:	2nd Semester / Stage 3 / 2025-2026
4. Description Preparation Date:	1-2-2026
5. Available Attendance Forms:	Students' signature on laboratory attendance sheet
6. Credit Hours / Units:	2 Credits / 45 hours practical / 15 weeks / 3 units
7. Course Administrator:	Ameer Hassan Hamza Alamire

8. Course Objectives

1. Provide students with practical skills in pharmaceutical analysis, focusing on the quantitative determination (assay) of drug substances.
2. Students will learn to apply physicochemical principles such as partition coefficients and various titration techniques (acid-base, redox, iodometric, and non-aqueous) to ensure the quality and purity of pharmaceutical preparations.

9. Teaching and Learning Strategies

- Practical Laboratory Sessions
- Calculations and Data Analysis Workshops
- Pre-lab Briefings and Clinical Correlation

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Subject Name	Learning Method	Evaluation Method
1	3	Understand drug distribution between octanol/water phases using succinic acid	Partition Coefficient	Practical Lab	Oral evaluation
2	3	Quantitative analysis of NSAIDs via acid-base titration	Assay of Indomethacin	Practical Lab	Experiment/Report
3	3	Mastering monoprotic weak acid titration in alcoholic solvent	Assay of Aspirin (Direct)	Practical Lab	Quiz

4	3	Understand back-titration and saponification reactions	Assay of Aspirin (Indirect)	Practical Lab	Oral evaluation
5	3	Analysis of sulfonamide diuretics using phenol red indicator	Assay of Furosemide	Practical Lab	Experiment/Report
6	3	Learn acid-catalyzed hydrolysis of amides and ceric ammonium sulfate redox titration	Assay of Paracetamol	Practical Lab	Quiz
7	3	Redox titration using Potassium Iodate and Starch indicator	Assay of Vitamin C (A)	Practical Lab	Experiment/Report
8	3	Understanding the Andrew's Reaction (Iodate in HCl)	Assay of Vitamin C (B)	Practical Lab	Oral evaluation
9	3	Introduction to direct and residual iodometric assays	Iodimetry Principles	Practical Lab	Experiment/Report
10	3	Mastery of residual titration for penicillin derivatives	Assay of Benzylpenicillin	Practical Lab	Quiz
11	3	Learn the principles and solvent systems for Non-Aqueous titration	Assay of Methyldopa	Practical Lab	Practical Exam
12	3	Identification and assay of an unknown acidic drug	Unknown Sample I	Practical Lab	Practical Exam
13	3	Identification and assay of an unknown redox-active drug	Unknown Sample II	Practical Lab	Report Review
14	3	Calculation review and laboratory safety assessment	Review Session	Assessment	Final Grade
15	3	Comprehensive Practical & Theoretical Exam	Final Exam	Practical & Theoretical Exam	Final Grade

11. Course Evaluation

- Quizzes: 5 Marks
- Experimental Accuracy: 5 Marks
- Seminar/Additional Activity: 5 Marks (e.g., pH ionization profiles for Indomethacin)
- Attendance & Professionalism: 5 Marks

12. Learning and Teaching Resources

- British Pharmacopoeia (BP) and United States Pharmacopeia (USP) for official assay methods
- Departmental Practical Manual for Pharmaceutical Chemistry (Stage 3)

Republic of Iraq
Al-Farabi University College of Pharmacy

Course Description Form

1. Course Name:	Applied Therapeutics I
2. Course Code:	Not provided
3. Semester / Year:	5th Class, 1st Semester / 2025-2026
4. Description Preparation Date:	1/3/2026
5. Available Attendance Forms:	Electronic attendance sheet and Students' signature on attendance sheet
6. Credit Hours / Units:	45 hours theoretical lectures / 15 weeks / 3 units
7. Course Administrator:	Lecturer Assist. Prof. Dr. Shaymaa Abdalwahed Abdulameer Email: shaimaa.abd@alfarabiuc.edu.iq

8. Course Objectives

1. Improve the knowledge and practice of students in the clinical application of drugs in the treatment of diseases and disorders in different organ systems.
2. Enable students to integrate clinical pharmacy practice with other health care providers in the clinical setting to ensure safe and effective use of medications.
3. Students will be able to design and modify drug treatment plans based on individual patient needs.
4. Provide comprehensive understanding of the fundamental principles of Applied Therapeutics and its role in healthcare system.
5. Appreciate pharmacist intervention in patient counselling on health-related issues and the use of efficient and safe pharmacological intervention.

9. Teaching and Learning Strategies

- Lectures with PowerPoint and Smart Board with Interactive Annotation
- Oral and written quizzes
- Educational videos

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Subject Name	Learning Method	Evaluation Method
1	3	Define Dyslipidemia; Assess pathophysiology of ASCVD; Identify clinical presentation and diagnosis; Discuss management including lifestyle modifications and pharmacological interventions	Pharmacotherapy in Dyslipidemia and Venous Thromboembolism	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams

2	3	Review characteristics of CKD and ESRD management; Define CKD; Assess etiology and pathophysiology; Identify clinical presentation and diagnosis; Discuss evidence-based guidelines	Chronic Kidney Disease (CKD) and End-Stage Renal Disease (ESRD)	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
3	3	Identify common symptoms in AKI; Identify appropriate drug therapy; Identify risk factors and high-risk populations with diagnosis, assessment, management and treatment	Acute Kidney Injury (AKI)	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
4	3	Define liver cirrhosis; Identify major etiology, signs, symptoms, complications; Recognize pathophysiologic abnormalities; Identify treatment approach; Review common symptoms	Liver Cirrhosis	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
5	3	Identify common symptoms in Arrhythmias; Focus on management enabling accurate diagnosis, classification, and treatment; Emphasize pharmacological and non-pharmacological interventions	Arrhythmias	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
6	3	Characterize presentation of common symptoms in stroke; Provide overview of pathophysiology, symptoms, complications, risk factors, diagnosis, and treatment; Develop patient safety and monitoring skills	Cerebrovascular Disease: Stroke	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
7	3	Identify common symptoms in VTE; Provide overview of etiology, symptoms, complications, risk factors, diagnosis, and treatment; Master pathophysiology, clinical evaluation, and management	Venous Thromboembolism (VTE)	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
8	3	Review primary care in Parkinson Disease; Identify common symptoms; Provide overview of etiology, symptoms, complications, risk factors, diagnosis, and treatment; Recognize pathophysiology and epidemiology	Parkinson Disease (PD)	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams

9	3	Provide overview of symptoms, complications, risk factors, diagnosis, and treatment for Viral hepatitis; Understand rationale for drug therapy; Focus on disease mechanism, diagnosis, and patient education	Viral Hepatitis	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
10	3	Review presentation and management of Epilepsy; Focus on disease mechanism, accurate diagnosis, pharmacological treatments, and patient education	Epilepsy	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
11	3	Illustrate demonstration of BPH and its management; Understand rationale for drug therapy; Focus on disease mechanism, accurate diagnosis, and patient education for long-term complications	Benign Prostatic Hyperplasia (BPH)	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
12	3	Review presentation and management of IBD; Focus on pathophysiology; Identify risk individuals, diagnose, and manage; Highlight pharmacological and non-pharmacological prevention and care	Inflammatory Bowel Disease	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
13	3	Focus on understanding MS pathophysiology; Identify risk individuals, diagnose, and manage; Highlight pharmacological and non-pharmacological management, prevention and care	Multiple Sclerosis	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
14	3	Focus on detecting, assessing, understanding, and preventing ADRs; Understand regulatory frameworks, case processing, risk management, and patient safety throughout product lifecycle	Pharmacovigilance	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
15	3	Focus on understanding pathophysiology of renal failure; Identify risk individuals, diagnose, and manage; Understand renal pathology and dialysis principles; Emphasize clinical management and patient monitoring	Renal Dialysis	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams

11. Course Evaluation

- 30 Marks (midterm + quizzes + attendance)
- 70 Marks (final exam)
- 100 Marks total

12. Learning and Teaching Resources

- Roger Walker, Clive Edwards (eds), Clinical Pharmacy and Therapeutics, Churchill Livingstone London, Latest edition
- Mary Anne Koda-Kimble (ed.), Applied Therapeutics: The Clinical Use of Drugs, Walter Kluwer, Latest edition

Republic of Iraq
Al-Farabi University College of Pharmacy

Course Description Form

1. Course Name:	Clinical Pharmacy I
2. Course Code:	Not provided
3. Semester / Year:	4th Class, 1st Semester / 2025-2026
4. Description Preparation Date:	1/3/2026
5. Available Attendance Forms:	Electronic attendance sheet and Students' signature on attendance sheet
6. Credit Hours / Units:	30 hours theoretical lectures / 15 weeks / 2 units
7. Course Administrator:	Lecturer Assist. Prof. Dr. Shaymaa Abdalwahed Abdulameer Email: shaimaa.abd@alfarabiuc.edu.iq

8. Course Objectives

1. Develop an understanding and acceptance of clinical pharmacy and pharmaceutical care as concepts and applications.
2. Enable the student to ensure safe and effective use of medications in disease state as a part of medical team.
3. Apply pharmaceutical and pharmacological knowledge in medication management and patient treatment.
4. Design and modify drug treatment plans based on individual patient needs.
5. Provide comprehensive understanding of the fundamental principles of clinical pharmacy and its role in healthcare.
6. Appreciate pharmacist intervention in patient counselling on health-related issues and the use of medicines.

9. Teaching and Learning Strategies

- Lectures with PowerPoint and Smart Board with Interactive Annotation
- Oral and written quizzes
- Educational videos

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Subject Name	Learning Method	Evaluation Method
1	2	Define clinical and community pharmacy; Identify major role of pharmacist to improve patient quality of life; Discuss Key Steps in Clinical Decision Making	Introduction to Clinical and Community Pharmacy: Drug Distribution Systems, Principles of Patient Education	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams

2	2	Review characteristics of management of pediatric and geriatric requiring specialized approaches; Focus on safety, dosage form adaptation, and multidisciplinary care	Clinical Pharmacy Practice in Neonates, Pediatrics and Geriatrics	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
3	2	Identify common symptoms in respiratory system; Identify appropriate drug therapy in Cough, Common Cold and Allergic Rhinitis; Explain etiology and pathogenesis; Identify risk factors and high-risk populations	Clinical Pharmacy in Respiratory System Care: Cough, Common Cold and Allergic Rhinitis	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
4	2	Review characteristics of common symptoms in GI system; Identify appropriate drug therapy in Diarrhea, Constipation, GERD, and Hemorrhoids; Highlight benefits outweigh risks	Clinical Pharmacy in G.I.T System Care: Diarrhea, Constipation, GERD, and Hemorrhoids	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
5	2	Identify common symptoms in Pediatric care; Provide overview of pathophysiology, symptoms, complications, risk factors, diagnosis, and treatment for Oral Thrush and Head Lice; Focus on rapid recognition and management	Pediatric Care Practice: Oral Thrush and Head Lice	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
6	2	Characterize presentation of common symptoms in skin conditions; Provide overview of pathophysiology, symptoms, complications, risk factors, diagnosis, and treatment for Acne, Scabies, Hair Loss, Psoriasis and Athlete's Foot; Develop patient safety and monitoring skills	Pharmacy Care in Skin Conditions: Acne, Scabies, Psoriasis, Hair Loss and Athlete's Foot	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
7	2	Identify common symptoms in Women Health Care; Provide overview of etiology, symptoms, complications, risk factors, diagnosis, and treatment; Master pathophysiology, clinical evaluation, and patient self-management education	Women Health Care: Cystitis and Vaginal Thrush, Primary Dysmenorrhea and Emergency Contraceptive Techniques	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams

8	2	Review primary care in CNS related problems; Identify common symptoms; Provide overview of etiology, symptoms, complications, risk factors, diagnosis, and treatment for Headache, Insomnia and Motion Sickness; Recognize pathophysiology and epidemiology	Pharmacy Care in CNS Related Problems: Headache, Insomnia and Motion Sickness	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
9	2	Provide overview of symptoms, complications, risk factors, diagnosis, and treatment for Eye and Ear disorders; Understand rationale for drug therapy; Focus on disease mechanism, accurate diagnosis, and patient education	Pharmacy Care in ENT Conditions	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
10	2	Review presentation and management of obesity and body weight control; Review management and patient care	Pharmacy Care in Obesity and Body Weight Control	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
11	2	Illustrate presentation of acute attack and management; Focus on critical role in management of pain and musculoskeletal disorders; Recommend OTC analgesics, topical treatments, and non-pharmacological advice; Provide essential support in tobacco cessation using NRT	Pharmacy Care in Management of Pain and Musculoskeletal Disorders; Nicotine Replacement Therapy (NRT)	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
12	2	Review presentation and management of poisoning; Focus on understanding pathophysiology; Identify risk individuals, diagnose, and manage; Highlight pharmacological and non-pharmacological prevention and care	Clinical Pharmacy Practice in Poisoning	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
13	2	Focus on understanding eczema and dermatitis; dandruff pathophysiology; Identify risk individuals, diagnose, and manage; Highlight pharmacological and non-pharmacological management, prevention and care	Clinical Pharmacy Practice in Eczema and Dermatitis; Dandruff	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams
14	2	Describe clinical manifestations and diagnosis of fungal skin infections, cold sore, corns and callus; Describe	Clinical Pharmacy in Fungal Skin Infections;	PowerPoint + Smart Board +	Oral and written quizzes, Mid-

		risk, pathophysiology and complications; Review drug therapy options and provide patient education and monitoring	Cold Sore; Corns and Callus	Educational Video	Term and Final Exams
15	2	Focus on understanding pathophysiology of oral hygiene, mouth ulcer and mouth thrush; Identify risk individuals, diagnose, and manage; Recognize pathophysiology and epidemiology risk assessment	Pharmacy Care in Oral Hygiene; Mouth Ulcer and Mouth Thrush	PowerPoint + Smart Board + Educational Video	Oral and written quizzes, Mid-Term and Final Exams

11. Course Evaluation

- 20 Marks (midterm + quizzes + attendance)
- 20 Marks (written exams of practical part + attendance)
- 60 Marks (final exam)
- 100 Marks total

12. Learning and Teaching Resources

- Paul Rutter, Community Pharmacy: Symptoms, Diagnosis and Treatment
- Roger Walker, Clive Edwards (eds), Clinical Pharmacy and Therapeutics, Churchill Livingstone, London, Latest edition

Republic of Iraq
Al-Farabi University College of Pharmacy
Course Description Form

. Course Name:	Medicinal Chemistry I
. Course Code:	N/A
. Semester / Year:	Semester 1 / Year 4
. Description Preparation Date:	June 2026
. Available Attendance Forms:	In-person (Theory & Practical)
. Credit Hours / Units:	4 Credits (3 Theory credits, 1 Practical Credit) / Total Hours: 45 Hours
. Course Administrator:	Humam Luay Qusay

8. Course Objectives

1. This course offers an in-depth exploration of the pharmaceutical chemistry and pharmacology of major drug classes that target key physiological systems. The curriculum focuses on the relationship between chemical structure and biological activity (SAR), the mechanism of action at specific receptors, and the therapeutic applications of these agents in treating various diseases.

9. Teaching and Learning Strategies

• Lectures, interactive discussions, laboratory practical sessions, and problem-solving assignments.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
	2	Understand cholinergic agents, receptors, and their biological subtypes	Cholinergic agents: Cholinergic agents, cholinergic receptors and their subtype	Theory Lecture / Practical	Quizzes & Written Exams
	5	Master stereochemistry, SAR, and mechanisms of cholinergic agonists and inhibitors	Cholinergic agents: Cholinergic agonists; stereochemistry and SAR; products; cholinesterase inhibitors	Theory Lecture / Practical	Quizzes & Written Exams
	5	Comprehend cholinergic blocking agents, alkaloids, analogues, and neuromuscular blockers	Cholinergic agents: Cholinergic blocking agents; SAR; solanaceous alkaloid and analogues;	Theory Lecture / Practical	Quizzes & Written Exams

			synthetic cholinergic blocking agents and products; ganglionic blocking agents; neuromuscular blocking agents		
	9	Understand neurotransmission, receptor mechanisms, and SAR of adrenergic agents and antagonists	Adrenergic agents: Adrenergic agents (adrenergic neurotransmitters), adrenergic receptor; drugs affecting adrenergic neurotransmission; sympathomimetic agents, adrenergic receptor antagonists	Theory Lecture / Practical	Quizzes & Written Exams
	5	Comprehend mechanisms and SAR of central nervous system depressants, relaxants, and antipsychotics	CNS drugs: CNS depressant; benzodiazepines and related compounds; barbiturate; CNS depressant with skeletal muscle relaxant properties; antipsychotics; anticonvulsants	Theory Lecture / Practical	Quizzes & Written Exams
	2	Understand classification and pharmacological roles of central nervous system stimulants	CNS drugs: CNS stimulants	Theory Lecture / Practical	Quizzes & Written Exams
	5	Master drug mechanisms targeting the renin-angiotensin pathway, calcium channels, and vasodilators	Drugs affecting cardiovascular system: Drugs affecting the Renin Angiotensin pathway and calcium blockers, vasodilators.	Theory Lecture / Practical	Quizzes & Written Exams

	7	Understand SAR and therapeutic derivations of H1 and H2 histamine receptor antagonists	Histamine and anti-histaminic agents: Structure-activity relationships at H1-receptors; first-generation antihistamine classes; second-generation antihistamines; recent antihistamine developments: the "dual-acting" antihistamines; histamine H2-antagonists: structural derivation of the "H2-antagonists"	Theory Lecture / Practical	Quizzes & Written Exams

11. Course Evaluation

12. Learning and Teaching Resources

• Foye's Principles of Medicinal Chemistry Roche PhD (Author), S. William PhD Zito 7th Edition PhD by Victoria PhD F., College of Pharmacy, Houston Uni, Texas, USA
• Wilson and Gisvolds textbook of organic medicinal and pharmaceutical chemistry, John M. B.; John H.B. (twelfth edition).
• An Introduction to Medicinal Chemistry 7th Edition by Graham L. Patrick, University of the West of Scotland, UK
• Peer-reviewed articles on structure-activity relationships (SAR) of cholinergic, adrenergic, and histaminic modulators.
• Online chemical mapping tools, PubChem, and structural biochemistry reference repositories.

Republic of Iraq
Al-Farabi University College of Pharmacy
Course Description Form

. Course Name:	Inorganic Pharmaceutical Chemistry
. Course Code:	N/A
. Semester / Year:	Semester 1 / Year 3
. Description Preparation Date:	June 2026
. Available Attendance Forms:	In-person (Theory & Practical)
. Credit Hours / Units:	3 Credits (2 Theory credits, 1 Practical Credit) / Total Hours: 30 Hours
. Course Administrator:	Humam Luay Qusay

8. Course Objectives

1) This course examines the clinical application of inorganic compounds, focusing on the relationship between chemical structure and therapeutic or diagnostic function.
2) Students will study the roles of key metals in medicine, including platinum anticancer agents and chelation therapy.
3) A significant component is dedicated to radiopharmacy, covering the principles, safe handling, and application of radiopharmaceuticals in advanced medical imaging and treatment.

9. Teaching and Learning Strategies

• Lectures, interactive discussions, laboratory practical sessions, and problem-solving assignments.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
	2	Understand properties and clinical applications of alkali metals	Alkali Metals: Lithium, Sodium, Potassium: Electron configuration, chemial properties of metals, Advantages and disadvantages using lithium-based drugs, Sodium as an essential ion in the human body, Active transport of sodium ions, Drugs, diet and toxicity of sodium ions, Potassium and its clinical application.	Theory Lecture / Practical	Quizzes & Written Exams
	2	Comprehend chemical properties and uses of alkaline earth metals	Alkaline Earth Metals: Magnesium, Calcium: Electron configuration of metals, Major uses and Chemical properties, Magnesium Biological importance and clinical applications and preparations. Calcium: the key to many human functions.	Theory Lecture / Practical	Quizzes & Written Exams

	4	Master the pharmaceutical applications of group 13 elements	Group 13: Aluminium, Boron and Gallium: General chemistry of group 13 elements, Pharmaceutical applications of boric acid, Bortezomib, Biological importance of Aluminiumant its adjuvants, Antacids, Aluminium-based therapeutics, Phosphate binders, Antiperspirant. Gallium Introduction, Chemistry, Pharmacology of gallium-based drugs and their uses	Theory Lecture / Practical	Quizzes & Written Exams
	2	Understand silicon-based drugs and isosteres compared to carbon analogues	The Carbon Group: General chemistry of group 14 elements, Silicon-based drugs versus carbon-based analogues, Introduction of silicon groups, Silicon isosters, Organosilicon drugs.	Theory Lecture / Practical	Quizzes & Written Exams
	4	Comprehend transition metal chemistry and roles of metal ions in biological systems	Transition Metals and d-Block Metal Chemistry: Electronic configurations, platinum anticancer agents, Iron and its role in biological systems, clinical applications. Copper-containing drugs, Silver: the future of antimicrobial agents?, Gold: the fight against	Theory Lecture / Practical	Quizzes & Written Exams

			rheumatoid arthritis and zinc and its role in biological systems, clinical applications and toxicity.		
	2	Understand mechanisms and agents used in heavy-metal chelation therapy	Chelation Therapy: What is heavy-metal poisoning? What is chelation? Chelation therapy, Calcium disodium edetate, Dimercaprol (BAL), Dimercaptosuccinic acid (DMSA), 2,3-Dimercapto-1-propanesulfonic acid (DMPS), and Lipoic acid (ALA).	Theory Lecture / Practical	Quizzes & Written Exams
	2	Understand properties and actions of protective adsorbents	Protective adsorbents	Theory Lecture / Practical	Quizzes & Written Exams
	2	Understand properties and functions of topical medicinal agents	Topical agents	Theory Lecture / Practical	Quizzes & Written Exams
	2	Understand application and chemistry of dental agents	Dental agents	Theory Lecture / Practical	Quizzes & Written Exams
0	2	Comprehend organometallic chemistry, metallocenes, and their anticancer/antimalarial applications	Organometallic Chemistry: What is organometallic chemistry and metallocenes? Ferrocene derivatives as potential antimalarial agent and antibreast cancer, Titanocenes in titanium-based anticancer agents and Vanadocene dichloride as anticancer	Theory Lecture / Practical	Quizzes & Written Exams

			agents, Further vanadium-based drugs: insulin mimetics.		
1	4	Master radiopharmacy dispensing, safety protection, and therapeutic clinical applications	Radioactive Compounds and Their Clinical Application, Radiopharmacy: dispensing and protection, Therapeutic use of radiopharmaceuticals.	Theory Lecture / Practical	Quizzes & Written Exams
2	2	Understand properties and handling of radiopharmaceuticals for medical imaging	Radiopharmaceuticals for imaging	Theory Lecture / Practical	Quizzes & Written Exams

11. Course Evaluation

12. Learning and Teaching Resources

• Essentials of Inorganic Chemistry For Students of Pharmacy, Pharmaceutical Sciences and Medicinal Chemistry by KATJA A. STROHFELDT, School of Pharmacy, University of Reading, UK
• Inorganic Medicinal and Pharmaceutical Chemistry by Block, Roche Soine and Wilson, latest edition
• Supplementary academic journals on organometallic complexes, radiopharmacy safety, and metal-based therapeutic ligands.
• Online pharmaceutical chemistry databases and inorganic molecular modeling resources.

Republic of Iraq
Al-Farabi University College of Pharmacy
Course Description Form

. Course Name:	Analytical Chemistry
. Course Code:	N/A
. Semester / Year:	Semester 1 / Year 1
. Description Preparation Date:	June 2026
. Available Attendance Forms:	In-person (Theory & Practical)
. Credit Hours / Units:	4 Credits (3 Theory credits, 1 Practical Credit) / Total Hours: 45 Hours
. Course Administrator:	Humam Luay Qusay

8. Course Objectives

1. By the end of this course, students will be able to:
1) Understand the fundamentals of classical and instrumental analytical techniques.
2) Apply statistical tools in interpreting analytical data.
3) Recognize the role of pharmacopoeias in pharmaceutical quality control.
4) Perform basic titrimetric and gravimetric analyses relevant to pharmaceutical compounds.

9. Teaching and Learning Strategies

• Lectures, interactive discussions, laboratory practical sessions, and numerical problem-solving tutorials.

1 . Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
	3	Understand types and essential roles of analytical chemistry in drug development and quality control	Introduction to Analytical Chemistry: Types and roles in drug development and QC	Theory Lecture / Practical	Quizzes & Written Exams
	4	Review fundamental concentration units, standardization methods, and exact solution preparation protocols	Review of Basic Concepts: Concentration units, standards, solution preparation	Theory Lecture / Practical	Quizzes & Written Exams
	4	Comprehend compendial specifications, USP, BP guidelines, monographs, and quality parameters	Introduction to Pharmacopoeias: USP, BP, monographs, specifications	Theory Lecture / Practical	Quizzes & Written Exams
	2	Apply interpretative skills to actual pharmacopoeial monographs and review foundational ICH Q2(R1) guidelines	Case Study: Interpreting pharmacopoeial monographs and ICH Q2(R1) overview	Theory Lecture / Practical	Quizzes & Written Exams
-6	5	Master quantitative gravimetric processing steps including	Gravimetric Analysis: Precipitation, weighing, error sources	Theory Lecture / Practical	Quizzes & Written Exams

		precipitation, accurate weighing, and handling error sources			
-8	5	Perform acid-base neutralization titrations, understand indicator dynamics, pH ranges, and mathematical calculations	Volumetric Analysis I: Acid-base titrations, indicators, pH, calculations	Theory Lecture / Practical	Quizzes & Written Exams
	3	Differentiate and execute precipitation and complexometric titration mechanisms like Mohr and EDTA methods	Volumetric Analysis II: Precipitation and Complexometric titrations (Mohr, EDTA)	Theory Lecture / Practical	Quizzes & Written Exams
0	3	Understand chemical oxidation-reduction principles, iodometry, and application of permanganometry	Redox Titrations: Principles, iodometry, permanganometry	Theory Lecture / Practical	Quizzes & Written Exams
1-12	7	Evaluate experimental datasets statistically using mean, SD, confidence limits, Q-test, and Grubbs test metrics	Statistical Evaluation of Data: Mean, SD, confidence limits, Q-test, Grubbs test	Theory Lecture / Practical	Quizzes & Written Exams
3	3	Understand instrumental principles of UV-Visible spectrophotometry, Beer's Law constraints, and clinical applications	UV-Visible Spectrophotometry: Principles, Beer's Law, applications	Theory Lecture / Practical	Quizzes & Written Exams
4	3	Comprehend modern electrochemical methods centering on potentiometry and conductometry instrumentation	Electrochemical Methods: Potentiometry, Conductometry	Theory Lecture / Practical	Quizzes & Written Exams
5	3	Introduction to separation techniques using thin-layer chromatography	Introduction to Chromatography: TLC, paper chromatography	Theory Lecture / Practical	Quizzes & Written Exams

		(TLC) and paper chromatography			

11. Course Evaluation

12. Learning and Teaching Resources

• Fundamentals of Analytical Chemistry – Skoog, West, Holler & Crouch
• Pharmaceutical Analysis – A.H. Beckett & J.B. Stenlake
• Quantitative Chemical Analysis – Daniel C. Harris
• Supplementary Compendial Guidelines: British Pharmacopoeia (BP), United States Pharmacopeia (USP), ICH Q2(R1)
• Official USP-NF/BP online portals and International Council for Harmonisation (ICH) guidelines index.