

Academic Program Description

University Name: **Al-Turath University**

College: **College of Pharmacy**

Academic and Professional Program Name: **Bachelor of Pharmacy**

Final Degree Awarded: **Bachelor of Pharmacy (B.Pharm.)**

Study System: **Course System**

Date of Preparing the Program Description: **14/01/2026**

Date of Completing the Form: **20/01/2026**



Signature: _____

Dean's Name:

Affairs: **Prof. Dr. Sajida Hussein Ismail**

Date: **20/01/2026**



Signature: _____

Assistant Dean for Scientific

Lec. **Dr. Ihsan Khudhair Jasim**

Date: **20/01/2026**

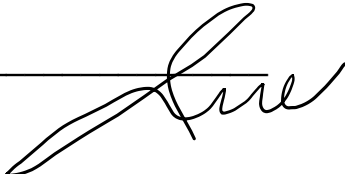
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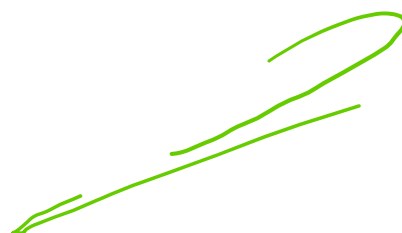
Quality Assurance and University Performance Division

Name of the Head of the Quality Assurance and University Performance Division:

Assist. Prof. Dr. Sanarya Thamer Naser

Date: **20/01/2026**

Signature: _____




Approved by the Dean

1. Program Vision

To achieve excellence and leadership in pharmacy education through quality education and academic accreditation, while fostering scientific research and innovation, and preparing highly competent pharmacy graduates equipped with the knowledge, professional skills, and competencies required to embrace digital transformation, keep pace with scientific and technological advances, meet labor market demands, contribute to community service, promote sustainable development, and compete at the global level.

2. Program Mission

The program is committed to delivering high-quality pharmacy education in accordance with quality assurance and academic accreditation standards through an innovative learning environment that promotes learning, scientific research, and innovation. The program prepares pharmacists with strong scientific knowledge, professional competencies, and ethical values who are capable of adapting to scientific and technological advancements, meeting labor market needs, advancing pharmaceutical care, contributing to community service, and supporting sustainable development.

3. Program Objectives

1-To achieve excellence in pharmacy education through the implementation of quality assurance and academic accreditation standards and the continuous improvement of the program in line with national and international benchmarks.

2-To prepare pharmacists with the scientific knowledge, professional competencies, research skills, and ethical values necessary for competent professional practice, lifelong learning, and successful integration into the labor market.

3-To promote scientific research, innovation, and knowledge generation while encouraging creativity in pharmaceutical sciences to advance healthcare services and contribute to community development.

4-To provide a modern learning environment supported by contemporary curricula and digital technologies that foster critical thinking, creativity, and responsiveness to scientific and technological advancements.

5- To strengthen partnerships with academic institutions, healthcare organizations, pharmaceutical industries, and community stakeholders in support of community engagement and sustainable development.

6-To develop the scientific, professional, and leadership capabilities of students and academic staff while fostering a culture of professional responsibility, excellence, and competitiveness.

4. Program Accreditation

The program does not have program Accreditation. But there is a plan for future

5. Other external influences

Presently, the program does not have an external sponsor. Nevertheless, it is fully supported by the internal resources of the college and university, ensuring its sustainability and alignment with academic standards. The program is designed and delivered in accordance with national accreditation requirements, and efforts are ongoing to establish future collaborations with professional bodies, pharmaceutical industries, and regulatory agencies to enhance external engagement and support.

6. Program Structure				
Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	8	18	9.8	
College Requirements	36	165	90.2	
Department Requirements	---	---	---	One department
Summer Training	2	pass	0	
Other	---	---	---	

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	Practical
First year-1st Semester		Human Anatomy and Histology	3	2
First year-1st Semester	ClMp 110	Medical Physics	1	2
First year-1st Semester	PcAc103	Analytical Chemistry	3	2
First year-1st Semester	PtMt104	Medical Terminology	1	----
First year-1st Semester	ClMb 105	Mathematics and Biostatistics	2	----
First year-1st Semester	TU 101	Human rights and democracy	2	----

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
First year-2nd Semester		Physiology I	3	2
First year-2nd Semester	PPhc109	Pharmaceutical Calculations	2	2
First year-2nd Semester	PcOc1111	Organic Chemistry I	3	2
First year-2nd Semester	TU 237	Arabic Language	2	-----
First year-2nd Semester	TU 141	Computer Sciences	----	2

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	Practical
Second year-1st Semester	PcOc2216	Organic Chemistry II	3	2
Second year-1st Semester	ClMm 217	Medical Microbiology I	3	2
Second year-1st Semester	PPp1 218	Physical Pharmacy I	3	2
Second year-1st Semester	Ptph13 219	Physiology I	3	2
Second year-1st Semester	TU 237	Arabic Language	2	---
Second year-1st Semester	TU 241	Computer Sciences	1	2
Second year-1st Semester		Baath Party crimes	2	---

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	Practical
Second year-2nd Semester	PcOc3 223	Organic Chemistry III	2	2
Second year-2nd Semester	ClMv 224	Medical Microbiology II	3	2
Second year-2nd Semester	PPp2 225	Physical Pharmacy II	3	2
Second year-2nd Semester	PtPh2 226	Physiology II	3	2
Second year-2nd Semester	phpa1 227	Pharmacognosy I	3	2
Second year-2nd Semester	TU 237	Arabic Language	2	-----

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	Practical
Third year-1st Semester	PcIc 330	Inorganic Pharmaceutical Chemistry	2	2
Third year-1st Semester	phpa2 331	Pharmacognosy II	2	2
Third year-1st Semester	PPt1 332	Pharmaceutical Technology	3	2
Third year-1st Semester	ClBi1 333	Biochemistry I	3	2
Third year-1st Semester	ClPy 334	Pathophysiology	3	2

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	Practical
Third year-2nd Semester	PcOp1 336	Organic Pharm. Chemistry I	3	2
Third year-2nd Semester	PtPc1 337	Pharmacology I	3	----
Third year-2nd Semester		Pharmaceutical and Cosmetics Preparations	3	2
Third year-2nd Semester	ClBi2 339	Biochemistry II	3	2
Third year-2nd Semester	PhPa3 340	Pharmacognosy III	2	2
Third year-2nd Semester	TU 344	Medical Ethics	1	----

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	Practical
Fourth year-1st Semester	PtPc3 444	Pharmacology II	3	2
Fourth year-1st Semester	PcOp2 445	Organic Pharm. Chemistry II	3	2
Fourth year-1st Semester	CpCp1 446	Clinical Pharmacy I	2	2
Fourth year-1st Semester	PBp 447	Biopharmaceutics	2	2
Fourth year-1st Semester	ClPu 448	Public Health	2	----

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
Fourth year-2nd Semester	PtPc3 450	Pharmacology III	2	----
Fourth year-2nd Semester	PcOp3 451	Organic Pharm. Chemistry III	3	2
Fourth year-2nd Semester	CpCp2 452	Clinical Pharmacy II	2	2
Fourth year-2nd Semester	PtGt 453	General Toxicology	2	2
Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	Practical
Fifth year-1st Semester	PcOp4 557	Organic Pharm. Chemistry IV	2	----
Fifth year-1st Semester	PIp2 558	Industrial Pharmacy II	3	2
Fifth year-1st Semester	CpAt1 559	Applied Therapeutics- I	3	-----
Fifth year-1st Semester	ClCc 560	Clinical Chemistry	3	2
Fifth year-1st Semester	ClCi 561	Hospital Training	----	4
Fifth year-1st Semester	PtCt 562	Clinical Toxicology	2	2

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	Practical
Fifth year-2nd Semester	CpPm 564	Pharmacoeconomic	2	----
Fifth year-2nd Semester	CpAt2 565	Applied Therapeutics- II	2	----
Fifth year-2nd Semester	CpTd 566	Therapeutic Drug Monitoring(TDM)	2	2
Fifth year-2nd Semester	PcAp 567	Advanced Pharmaceutical Analysis	3	2
Fifth year-2nd Semester	CpHt 568	Clinical Laboratory Training	----	4
Fifth year-2nd Semester		Drug delivery system	2	----
Fifth year-2nd Semester	PPb 570	Pharmaceutical Biotechnology	1	----
Fifth year-2nd Semester	Pr 563	Graduation project	1	----

8. Expected learning outcomes of the program	
Knowledge	
Fundamental Knowledge in Pharmaceutical Sciences	Students acquire a solid foundation in the fundamental principles of pharmaceutical sciences, enabling them to understand core concepts and their diverse applications.
Advanced Knowledge in Pharmaceutical Sciences	Students interpret recent advances in pharmaceutical, medical, biological, and chemical sciences relevant to contemporary pharmacy practice.
Integration of Theoretical Knowledge and Practical Application	Students apply theoretical knowledge to interpret practical applications, particularly those related to pharmaceutical formulations, dosage forms, drug dosage calculations, and measurement technique
Skills	
Critical Thinking and Analytical Skills	Students analyze pharmaceutical problems and propose appropriate solutions based on scientific evidence and professional standards.
Professional and Practical Skills	Students apply pharmaceutical knowledge and practical skills to deliver safe and effective pharmaceutical services within healthcare settings.
Research Skills	Students employ scientific research methodologies to design studies, conduct experiments, analyze findings, and prepare scientific reports.
Assessment and Decision-Making Skills	Students evaluate health conditions related to pharmacy practice and make appropriate evidence-based professional decisions.
Ethics	
Professional Ethics and Safety	Students demonstrate commitment to the ethical principles of the pharmacy profession while adhering to safety and quality standards in laboratories and professional practice environments.
Teamwork and Professional Responsibility	Students work effectively within multidisciplinary teams, particularly during practical training, while demonstrating professionalism, collaboration, and accountability.
Professional Communication	Students communicate effectively with patients and healthcare professionals using appropriate verbal, written, and presentation skills.
Lifelong Learning and Self-Development	Students engage in lifelong learning and continuous professional development to enhance their competencies and improve their career prospects in the evolving healthcare sector.

9. Teaching and Learning Strategies

The program adopts contemporary student-centered teaching and learning strategies that promote active engagement and the achievement of program learning outcomes. These strategies include interactive lectures, laboratory-based learning, practical and clinical training, problem-based learning, e-learning, research activities, and guided discussions. Collectively, these approaches foster professional competence, critical thinking, lifelong learning, and continuous improvement in accordance with quality assurance and academic accreditation standards.

10. Evaluation methods

Quizzes

Oral exams

Midterm written exams

Final course exams

Practical exams

11. Faculty						
Faculty Members						
Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Prof.Dr Sajida Hussein Ismael	Pharmacy	Pharmacology			√	
Prof.Dr. Yousif Kadhim Alhaidarei	Chemistry	Physical chemistry			√	
Assistant Prof. Dr. Entidhar Jasim Mohammed Al-Akkam	Pharmacy	pharmaceutics			√	
Lecturer Dr Ihsan Khudhair Jasim	Pharmacy	pharmaceutics			√	
Lecturer Dr. Ali Hayder Hamza	Pharmacy	Pharmaceutical Chemistry			√	
Lecturer Dr.Zainab.Taha.	Pharmacy	Clinical pharmacy			√	
Lecturer Dr. Hasanain Amer Naji	Pharmacy	Pharmaceutical Chemistry			√	
Lecturer Dr Sanarya Thamer Naser	Pharmacy	pharmaceutics			√	
Lecturer Dr. Sura Akram Mohammed	Pharmacy	pharmacology			√	
Lecturer Dr. Rasha Abdul Kareem Abdul Kadeer	Pharmacy	pharmacognosy			√	
Lecturer Dr. Zaid Khalid Ahmed	Veterinary surgeon	Parasitology				
Lecturer Dr. Mustafa Eglah Kadhim	Pharmacy	pharmaceutics				
Lecturer Dr. Abbas Mused Ajed	Pharmacy	Clinical biochemistry				
Lecturer Dr. Maryam Hadi Sadiq	Pharmacy	Pharmacology				
Lecturer Dr. Mohamed Muzahim Aziz	Pharmacy	Clinical pharmacy				
Assist Lecturer Luma Eassa Hammodi	Pharmacy	Pharmacology			√	
Assist Lecturer Bker Emad Najem	Pharmacy	pharmaceutics			√	
Assist Lecturer Ameer Amir Abdulhussin	Pharmacy	Clinical biochemistry			√	
Assist Lecturer Maryam Saleem Mohammed Ali	Pharmacy	pharmaceutics			√	
Assist Lecturer Asmaa mahdi hussen	Pharmacy	pharmacognosy			√	
Assist Lecturer. Halah Hussein Ali	Pharmacy	pharmaceutics			√	
Assist Lecturer Othman Farooq Bakir	Pharmacy	pharmaceutics			√	
Assist Lecturer Afaq Mahdi Ali	Pharmacy	pharmaceutics			√	
Assist Lecturer Hayjaa mehasen musa	Pharmacy	Pharmaceutical chemistry			√	
Assist Lecturer Aya Nabeel Yasser	Pharmacy	Clinical pharmacy			√	
Assist Lecturer hussamaldin Haytham	Pharmacy	Clinical pharmacy				
Assist Lecturer Meqat Tlib Hamada	Pharmacy	Pharmacology				
Assist Lecturer Safa Adnan Mahmood	Pharmacy	Pharmaceutical Chemistry			√	
Assist Lecturer Asmaa Edrees Fadhil	Chemistry	Organic Chemistry			√	

Assist Lecturer Sally Mazen Saad	Material sciences	bioceramic			√	
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Mentoring new faculty members

The College is committed to supporting newly appointed faculty members through structured mentoring and orientation programs designed to enhance their academic and professional competencies. Faculty members are encouraged to participate in professional development courses offered by the University, the Ministry of Higher Education and Scientific Research, and affiliated training centers, including programs on teaching methods and their effective application in higher education.

12. Professional development of faculty members

The program promotes the continuous professional development of its academic staff by encouraging participation in training courses, workshops, seminars, and scientific conferences at both national and international levels. These activities aim to strengthen academic, research, and teaching competencies, foster the adoption of innovative teaching strategies and digital learning technologies, and enhance the overall quality of teaching and learning, thereby supporting the achievement of the Program Learning Outcomes.

13. Acceptance Criterion

The program follows the admission regulations and policies established by the Ministry of Higher Education and Scientific Research. Admission is based on the applicable national requirements and regulations to ensure the selection of academically qualified students in a fair and transparent manner, consistent with the program's objectives and quality assurance standards.

14. The most important sources of information about the program

Program information is available through the official University and College websites, the Academic Program Description, the study plan, the Student Handbook, University regulations and policies, as well as the University's official electronic platforms and communication channels. These resources ensure easy access to academic and administrative information while promoting effective communication with students and other stakeholders.

15. Program Development Plan

The program adopts a continuous development plan aimed at enhancing the quality of pharmacy education through the periodic review and revision of the curriculum, continuous updating of the Program Learning Outcomes in response to scientific and technological advances and labor market needs, promotion of scientific research and innovation, enhancement of laboratory facilities and the learning environment, expansion of partnerships with healthcare and professional organizations, and fulfillment of quality assurance and academic accreditation requirements to achieve continuous improvement and institutional excellence.

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B 1	B2	B3	B4	C1	C2	C3	C4
First/ 1st semester		Human Anatomy and Histology	Basic				√		√					√	
	CIMp110	Medical Physics	Basic				√		√				√		
	PcAc103	Analytical Chemistry	Basic				√			√			√		
	PtMt104	Medical Terminology	Basic			√					√			√	
	CIMb105	Mathematics and Biostatistics	Basic				√				√				√
	TU 135	Human rights and democracy	Basic							√	√				√
First /2nd semester	Ptph13 219	Physiology I	Basic	√	√	√									
	PPhc109	Pharmaceutical Calculations	Basic			√						√			√
	TU 141	Computer Sciences	Basic										√	√	√

	PcOc1111	Organic Chemistry I	Basic		√						√				√
	TU 237	Arabic Language	Basic							√	√				√
Second/ 1st semester	PcOc2 216	Organic Chemistry II	Basic					√		√				√	
	CIMm 217	Medical Microbiology I	Basic				√				√				√
	PPp1 218	Physical Pharmacy I	Basic			√			√				√		
	Ptph13 219	Physiology I	Basic	√	√	√									
	TU 201	Baath crimes	Basic						√				√	√	
	TU 241	Computer Sciences	Basic										√	√	√
Second / 2nd semester	PcOc3 223	Organic Chemistry III	Basic							√			√		√
	CIMv 224	Medical Microbiology II	Basic		√			√				√			
	PPp2 225	Physical Pharmacy II	Basic	√							√			√	
	PtPh2 226	Physiology II	Basic		√	√		√							

	phpa1 227	Pharmacognosy I	Basic	√	√	√									
	TU 237	Arabic Language	Basic							√	√				√
Third / 1st semester	PcIc 330	Inorganic Pharmaceutical Chemistry	Basic							√	√	√			
	phpa2 331	Pharmacognosy II	Basic		√			√	√						
	PPt1 332	Pharmaceutical Technology I	Basic		√		√	√							
	ClBi1 333	Biochemistry I	Basic								√		√		√
	ClPy 334	Pathophysiology	Basic			√								√	√
Third /2nd semester	PcOp1 336	Organic Pharm. Chemistry I	Basic			√	√	√							
	PtPc1 337	Pharmacology I	Basic						√			√	√		
		Pharmaceutical and cosmetics preparations	Basic						√	√	√				
	ClBi2 339	Biochemistry II	Basic	√								√		√	

	PhPa3 340	Pharmacognosy III	Basic			√				√			√	
	TU 344	Medical Ethics	Basic					√			√			√
Fouth / 1st semester	CpCp1 446	Pharmacology II	Basic	√		√			√					
	PBp 447	Organic Pharm. Chemistry II	Basic					√		√			√	
	ClPu 448	Clinical Pharmacy I	Basic							√	√	√		
	PtPc3 444	Biopharmaceutics	Basic		√				√				√	
	PcOp2 445	Public Health	Basic			√						√	√	
	PtPc3 450	Pharmacology III	Basic				√				√			√
	PcOp3 451	Organic Pharm. Chemistry III	Basic						√				√	√

Fourth / 2nd semester	CpCp2 452	Clinical Pharmacy II	Basic	√	√	√									
	PtGt 453	General Toxicology	Basic					√	√	√					
	PIp1 454	Industrial Pharmacy I	Basic							√		√	√		
	CpCs 455	Communication Skills	Basic				√				√				√
Fifth/ 1st semester	PcOp4 557	Organic Pharm. Chemistry IV	Basic		√							√	√		
	PIp2 558	Industrial Pharmacy II	Basic			√						√		√	
	CpAt1 559	Applied Therapeutics-I	Basic		√		√	√							
	ClCc 560	Clinical Chemistry	Basic			√				√				√	
	ClCi 561	Hospital Training	Basic					√				√			√
	PtCt 562	Clinical Toxicology	Basic				√				√			√	

Fifth / 2nd semester	CpPm 564	Pharmacoeconomic	Basic			√						√		√	
	CpAt2 565	Applied Therapeutics-II	Basic					√		√				√	
	CpTd 566	Therapeutic Drug Monitoring (TDM)	Basic	√	√	√									
	PcAp 567	Advanced Pharmaceutical Analysis	Basic							√	√	√			
	CpHt 568	Clinical Laboratory Training	Basic					√	√					√	
		Drug delivery system	Basic			√				√				√	
	PPb 570	Pharmaceutical Biotechnology	Basic		√			√							√
	Pr 563	Graduation project	Basic				√				√				√

1st stage Course Description

1. Course Name:					
Human anatomy and Histology					
2. Course Code:					
3. Semester / Year:					
First / First					
4. Description Preparation Date:					
2025					
5. Available Attendance Forms:					
In -person attendance					
6. Number of Credit Hours (Total) / Number of Units (Total)					
45/4					
7. Course administrator's name (mention all, if more than one name)					
Name: Assist. Prof. Zaid Khalid Ahmed Zaid.khaled@uoturath.edu.iq Assist. Lecturer. Halah Hussein Ali halah.hussien@uoturath.edu.iq Assist. Lecturer. Asmaa Mahdi					
8. Course Objectives					
Course Objectives		- To gain a basic understanding of histology and anatomy comprehend the characteristics of cells and their interactions with one another as components of tissues and organs; - To be able to describe the normal structure and function of various cell types, tissues, and organs and to distinguish their histological structures from one another through microscopic examination and describe the system's anatomy. - To describe the fundamental concepts of general human histology and anatomy at the normal cellular.			
9. Teaching and Learning Strategies					
Strategy	1. Research and induction 2. Interactive conversations 3. Brainstorming 4. Presentation and recitation				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	The study of general anatomy and histology, including anatomical positions, body regions, and body cavities, is essential for understanding the structural organization of the human body Practical: Anatomical models & terms. Microscopic usage & cell identification	General anatomy: Anatomical Positions, Body regions ,Body cavities. Introduction to Histology: Definition , basic concepts of cell, tissue , organ , system .	16 Lectures, Discussions, and Reports	Exam and classroom activities

2	3	The study of the four primary tissue types—epithelial, connective, muscular, and nervous tissues—is essential for understanding the structural and functional organization of the human body, appropriate treatment Practical: Identification of various epithelial tissue slides. - Identification of various connective tissue slides (including cartilage and bone). - Identification of muscular tissue slides (skeletal, cardiac, smooth)	Overview of the Four Primary tissue types -Epithelial Tissues , - Connective Tissues, - Muscular Tissues, - Nervous Tissue	=	=
3	3	The study of the musculoskeletal system, including bones and joints, is essential for understanding body support, movement, protection of organs Practical: Identification of major bones on skeletal models.	Musculoskeletal System (- Bones & Joints):	=	=
4	3	The study of the circulatory (cardiovascular) system, including its anatomy and histology, is essential for understanding blood circulation, tissue perfusion, Practical: Microscopic identification of compact and spongy bone, and different types of cartilage	Circulatory System (Cardiovascular System):Anatomy & Histology	=	=
5	3	The study of the lymphatic system and blood is essential for understanding immune defense, fluid balance, and transport functions, Practical: Identification of heart chambers, major vessels on models/pro-sections Microscopic identification of heart wall, arteries, veins, and capillaries	Circulatory System (Lymphatic System) & Blood.	17 =	=
6	3	The study of the upper gastrointestinal tract, including the oral cavity, pharynx, esophagus, and stomach, is essential for understanding digestion, absorption initiation, Practical: -Identification of lymphoid organs on models/	Digestive System (Part 1 - Upper GIT): Oral cavity, pharynx, esophagus, stomach	=	=

		prosections - Microscopic identification of blood cells (various types of WBCs), and general structure of lymph nodes			
7Mid-term examination					
8	4	The study of the lower gastrointestinal tract and accessory digestive organs, including the small and large intestines, rectum, anus, salivary glands, pancreas, liver, and gallbladder, is essential for understanding digestion, absorption, metabolism Practical: Identification of upper digestive tract parts on models/pro-sections, Microscopic identification of oral cavity, esophagus, and stomach	Digestive System (Part 2 - Lower GIT & Accessory Organs): Small intestine, large intestine, rectum, anus. Salivary glands, pancreas, liver, gallbladder.	=	=
9	4	The study of the nervous system, including the anatomy and histology of the central and peripheral nervous systems, is essential for understanding neural organization, signal transmission Practical: Identification of major brain regions and spinal cord on models. Microscopic identification of nerve tissue (neurons, nerve fibers) and ganglia	Nervous System: Anatomy & Histology: Central Nervous System (brain, spinal cord) and Peripheral Nervous System (nerves, ganglia), basic organization	=	=
10	4	The study of the respiratory system, including its anatomy and histology, is essential for understanding gas exchange, respiratory regulation Practical: Identification of respiratory system components on models/prosections Microscopic identification of trachea, bronchus, bronchioles, and lung tissue (alveoli).	Respiratory System: Anatomy & Histology	18 =	=
11	3	The study of the urinary system, including its anatomy and histology, is essential for understanding urine formation, fluid and electrolyte balance, Practical: Identification of urinary system organs on models/pro-sections.	Urinary System: Anatomy & Histology	=	=

		<i>Microscopic identification of kidney (nephron components), ureter, and bladder</i>			
12	3	The study of the integumentary system, including the anatomy and histology of the skin and its accessory structures, is essential for understanding protection, thermoregulation, sensory functions Practical: Microscopic identification of thick and thin skin, and accessory structures	Integumentary System (The Skin): - Anatomy: Layers of the skin (epidermis, dermis, hypodermis). Histology: Detailed histology of thick and thin skin, epidermal layers, , accessory structures (hair follicles, sebaceous glands, sweat glands).	=	=
13	3	The study of the endocrine system anatomy is essential for understanding the location, structure, and relationships of endocrine glands, which regulate hormones, metabolism, and growth. Practical: Identification of endocrine glands on anatomical models	Endocrine System: Anatomy: pituitary, thyroid, parathyroid, adrenal, pancreas-islets of Langerhans, pineal, gonads	=	=
14	3	The study of endocrine system histology, including the pituitary, thyroid, parathyroid, adrenal glands, islets of Langerhans, and pineal gland, is essential for understanding hormone-producing cells. Practical: Microscopic identification of selected endocrine glands.	Endocrine System: Histology pituitary, thyroid, parathyroid, adrenal glands, islets of Langerhans, and pineal gland	=	=
15	3	The study of the male and female reproductive systems is essential for understanding the anatomy and function of reproductive organs, gametogenesis, hormonal regulation Practical: Identification of male reproductive organs on models/pro-sections. - Microscopic identification of testes and accessory glands -Identification of female reproductive organs on models/pro-sections. - Microscopic identification of	Male and Female Reproductive System:	19 =	=

		ovary (including different follicle stages) and uterus.			
11. Course Evaluation					
Mid-term examination (15 marks) Quiz and homework (5 marks) Practical work (20 marks) Final examination (60 marks)					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			1) Anatomy and Physiology for Healthcare by Paul Marshall; Beverly Gallacher; Jim Jolly; Shupikai Rinomhota 2) Atlas of Human Anatomy by Frank H. Netter 3) Basic Histology: text and Atlas, 11th ed. BY Luiz Carlos, Uchoa Junqueira 4) Wheaters functional histology: a text and colour atlas 6th ed. BY Yung , Barbara		
Main references (sources)					
Recommended books and references (scientific journals, reports...)					
Electronic References, Websites					

1. Course Name:	
Analytical Chemistry	
2. Course Code:	
PcAc103	
3. Semester / Year:	
First Semester / 2024-2025	
4. Description Preparation Date:	
2025	
5. Available Attendance Forms:	
In-person (Physical Attendance)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
total: 52 Hours (3 Hours Theory + 1 Hour Practical per week)	
7. Course administrator's name (mention all, if more than one name)	
Name: ☐ Prof. Dr. Yousif Kadim Abd Al-Amir • Email: yousif.kadim@uoturath.edu.iq • ☐ Asst. Lect. Asmaa Edrees Fadhil • Email: asmaa.edrees@uoturath.edu.iq •	
8. Course Objectives	
Course Objectives	☐ Acquiring Practical Experience: Providing students with applied skills and scientific expertise, with an intensive focus on neutralization techniques and reactions. ☐ Acid-Base Analysis: Conducting an in-depth study of the effect of acidity on the chemical reactions of both simple and complex compounds. ☐ Qualitative Analysis Significance: Understanding the mechanisms of qualitative analysis and its vital applications in life sciences, medical, and scientific fields. ☐ Mastering Titration Methods: Detecting and estimating chemical compounds using advanced analytical tools, including: • Precipitation Titration. • Complexometric Titration. • Redox Titration.
9. Teaching and Learning Strategies	

Strategy	1. Comprehensive Theoretical Lectures: Delivering academic content covering the scientific foundations of each analytical method. 2. Research and Applied Reports: Assigning periodic reports on analytical applications in testing chemical compounds and pharmaceutical preparations to link the curriculum with the labor market. 3. Visual and Interactive Learning: Utilizing educational videos and simulations to simplify complex concepts. 4. Academic References: Relying on standard textbooks and modern supporting references to enhance self-research. 5. Interactive Scientific Dialogues: Organizing discussion sessions and seminars to foster critical thinking and scientific problem-solving.
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10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Statistical data analysis & Gravimetric methods	Review of core concepts in Analytical Chemistry	Lecture	Oral exam & Discussion
5-2	10	Statistical data analysis & Gravimetric	Evaluation of Gravimetric analysis methods	Lecture	Oral exam & Discussion
6	4	Organic and Inorganic precipitates	scope of Gravimetric analysis applications	Lecture	Oral exam & Discussion
7-8	5	Volumetric methods: Calculations, Acid-Base neutralization & pH	introduction to Volumetric analysis method	Lecture	Oral exam & Discussion
9	3	Chemical neutralization reactions	Buffer solutions	Lecture	Oral exam & Discussion
10-11	5	Details of Precipitation methods of	Theory of complex system neutralization	Lecture	Oral exam & Discussion
12	4	Volumetric methods for complex systems	pH calculation in complex systems	Lecture	Oral exam & Discussion
13-14	6	Redox reactions in	Equilibrium in Redox systems	Lecture	Oral exam & Discussion
15	4	Various Spectroscopic methods)	Spectroscopy (Types and Equipment)	Lecture	Oral exam & Discussion

11. Course Evaluation	
The total grade is 100, distributed based on daily preparation, quizzes, oral and monthly exams, reports, and the final exam: • Midterm Exam: 20 Marks • Practical Exam (including details): 20 Marks • Final Exam: 60 Marks	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	<i>Fundamentals of Analytical Chemistry</i> by Skoog and West.
Main references (sources)	<i>Fundamentals of Analytical Chemistry</i> by Skoog and West.
Recommended books and references (scientific journals, reports...)	ResearchGate and Google Scholar.
Electronic References, Websites	YouTube.

1. Course Name:					
Medical Terminology					
2. Course Code:					
PtMt104					
3. Semester / Year:					
1 st semester / 2025 – 2026					
4. Description Preparation Date:					
2025					
5. Available Attendance Forms:					
on campus					
6. Number of Credit Hours (Total) / Number of Units (Total):					
One hours per week (theory) / units = 1					
7. Course administrator's name (mention all, if more than one name)					
Name: Assist. Prof. Dr. Entidhar Jasim Mohammed Email: entidhar.Jasim@uoturath.edu.iq					
8. Course Objectives					
Course Objectives		Knowledge - Understanding basic language foundations: learning the origins of medical terminology, primarily from Latin and Greek. - Building a strong foundation in analyzing and constructing medical terms using roots, prefixes, and suffixes. - Connecting medical terminology with basic anatomy and physiology. - Becoming familiar with common diseases and clinical procedures, with the aim of enabling students to effectively understand, read, write, and correctly pronounce medical terms.			
9. Teaching and Learning Strategies					
Strategy		Recognizing commonly used medical abbreviations			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	Students will understand the basic knowledge of medical terminology from word roots and common suffixes	Basic word roots and common suffixes	Presentation and Lecturing Group Discussions	- Oral Examination -Comprehensive Written Examination - Home Assignments
1	1	Students will understand the basic knowledge of medical terminology from roots, suffixes and prefixes which	More word roots, suffixes and prefixes related to pharmaceutical sciences (pharmacognosy,	Presentation and Lecturing Group Discussions	-Oral Examination -Comprehensive Written Examination - Home

		related to pharmaceutical sciences (pharmacognosy, clinical pharmacy, pharmaceuticals ,... etc.)	clinical pharmacy, pharmaceuticals, ... etc.)		Assignments
3 - 4	2	Students will understand the basic anatomical terms and abnormal conditions	Basic anatomical terms and abnormal conditions	Presentation and Lecturing Group Discussions	-Oral Examination -Comprehensive Written Examination - Home Assignments
5	1	Students will be able to identify the most important terminologies for the Genitals and urinary system	The genitals and urinary tract	Presentation and Lecturing Group Discussions	-Oral Examination -Comprehensive Written Examination - Home Assignments
6	1	Students will be able to identify the most important terminologies for the gastrointestinal system	The gastro-intestinal tract	Presentation and Lecturing Group Discussions	- Oral Examination -Comprehensive Written Examination -Home Assignments
7	1	Students will be able to identify the most important terminologies for the cardiovascular system	The heart and cardiovascular system	Presentation and Lecturing Group Discussions 25	Oral Examination Comprehensive Written Examination Home Assignments
8 - 9	2	Students will be able to identify the most important terminologies for the Symptoms, diagnoses, treatments, communication qualifiers, and statistics	Symptoms, diagnoses, treatments, communication qualifiers, and statistics		
10	1	Students will be able to identify the most important terminologies for Growth and development, and body orientation	Growth and development, and body orientation		

11	1	Students will be able to identify the most important terminologies for women's reproductive system	Gynecology, pregnancy, and childbirth		
12	1	Students will be able to identify the most important terminologies for the vision system and respiratory tract	The eye and the respiratory tract		
13 - 14	2	Students will be able to identify the most important terminologies for the nervous system	The nervous system and behavioral disorders		
15	1	Students will be able to identify the most important terminologies for the blood, lymphatic and immune system	Blood and immunity		

11. Course Evaluation

25% mid-term exam: 5% Assignments and daily quizzes, 70% final exam

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	- Collins CE, DePetris A. A short course in medical terminology. 2nd.ed., Lippincott Williams and Wilkins; 2011. - Medical Terminology: A Text/Workbook (4th ed.)
Main references (sources)	Medical Terminology: A Text/Workbook (4th ed.) - Introduction to Medical Terminology, 1st ed.
Recommended books and references (scientific journals, reports...)	• Basic Medical Language. • Medical Language for Modern Health Care. • Mastering Healthcare Terminology. • Medical Terminology for Health Care Professionals.
Electronic References, Websites	Google research

1. Course Name:					
Biostatistics					
2. Course Code:					
CIMb 105					
3. Semester / Year:					
First / First					
4. Description Preparation Date:					
2025					
5. Available Attendance Forms:					
In person attendance					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2 /2					
7. Course administrator's name (mention all, if more than one name)					
Name: Sally Mazen Saad Alshummari Email: sally.mzen@uoturath.edu.iq					
8. Course Objectives					
Course Objectives		To enable the student to use statistical methods in collecting and analyzing vital and medical data in pharmaceutical sciences, and to understand the basics of probability necessary for scientific research.			
9. Teaching and Learning Strategies					
Strategy		1. Theoretical lectures 2. Problem-based learning 3. Practical applications using statistical software such as SPSS or Excel			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understanding the fundamental principles of biostatistics	Fundamentals of of Biostatistics	Theoretical lecture	Oral questions
2	2	Ability to describe data statistically	Descriptive Statistics	Practical application on the board	Homework
3	2	Mastering basic integration rules	Integration	Problem solving	Quiz
4	2	Mastering differentiation rules and their applications	Differentiation	Theoretical explanation	Classroom assessment
5	2	Calculating areas under statistical curves	Applications of Area Under the Curve	Theory	Homework
6	2	Understanding sampling distributions	Samples	Interactive lecture	Exam
7	2	Estimating confidence intervals for	Confidence intervals	Solving exercises	Classroom assessment

		data			
8	2	Distinguishing between types of variables	Dependent and independent Variables	Theoretical explanation	Quiz
9	2	Measuring the strength of relationships between variables	Correlation	Explanation	Report
10	2	Constructing statistical prediction models	Regression	Explanation and practice	Homework
11	2	Hypothesis testing for a single sample	One-Sample Tests	Evening session	Exam
12	2	Comparing results between two samples	Tests of Two Samples	Application	Report
13	2	Analysis of variance for multiple groups	Analysis of variance Test	Theoretical explanation	Oral questions
14	2	Dealing with abnormal data	Choices in the Domain of Nonnormal Distributions	Discussion	Homework
15	2	Correlation analysis for categorical data	Correlation test for categorical variable	General review	Comprehensive final exam
11. Course Evaluation					
Midterm exam: 20 marks + Reports, quizzes, and daily attendance: 10 marks					
Final exam: 70 marks					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Calculus , Third Edition, Second Edition		
Main references (sources)					
Recommended books and references (scientific journals, reports...)			Introductory Biostatistics for the Health Science		
Electronic References, Websites					

1. Course Name:					
Physiology1					
2. Course Code:					
Ptp13219					
3. Semester / Year:					
First semester 2025-2026					
4. Description Preparation Date:					
2025					
5. Available Attendance Forms:					
Attendance					
6. Number of Credit Hours (Total) / Number of Units (Total)					
3hr theoretical + 1 hr practical					
7. Course administrator's name (mention all, if more than one name)					
Name: Lecturer Dr. Mariam H. Sadiq Assist lecturer Maryam Saleem Mohammed Ali Email: mariam.hadi@uoturath.edu.iq maryam.saleem@uoturath.edu.iq					
8. Course Objectives					
Course Objectives		- Study of human physiology and how body organized - Study of human cellular structure ,protein and metabolic pathways - Study the movement of molecules across cell membrane - Study of the nervous system and the processes of neural signal transmission. - Study of sensory physiology			
9. Teaching and Learning Strategies					
Strategy		- Utilizing additional diagrams and illustrations beyond the curriculum. - Referring to educational YouTube resources. - Conducting periodic examinations as previously agreed.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
21-	6 2	The theoretical part covers cell the introduction to physiology , while the practical part focuses on blood physiology and blood grouping techniques	Introduction to physiology and how body organized and homeostasis practical part: physiology of blood & blood grouping	- PowerPoint presentations - Laboratory experiments	preparing reports, completing assignments, and participating in both oral and written examination
3-6	12 3	Study the cellular structure ,protein and metabolic pathway Practical part : : measurement of the	the cellular structure ,protein and metabolic pathway	- PowerPoint presentations - Laboratory experiments	preparing reports, completing assignments, and participating in both

		bleeding time and clotting time	• Study of blood coagulation factors		oral and written examination
7-9	6 2	Study the movement of molecules across cell membrane Practical part: determination of blood pressure & measurement of body temperature	Study the movement of molecules across cell membrane practical methods for measuring blood pressure and body temperature. •	• PowerPoint presentations • Laboratory experiments •	preparing reports, completing assignments, and participating in both oral and written examination
10-13	12 3	Nervous system physiology Practical part: estimation of hemoglobin & determination of blood glucose level	• Study of the nervous system and the mechanisms of neural signal transmission Study of anemia Study of diabetes and its types	• PowerPoint presentations • Laboratory experiments	preparing reports, completing assignments, and participating in both oral and written examination
14-15	3 1	Sensory physiology Practical part: Determination of Respiratory rate and lung volumes	Study of the Sensory physiology and the mechanisms for maintaining optimal oxygen levels	• PowerPoint presentations • Laboratory experiments • 30	preparing reports, completing assignments, and participating in both oral and written examination

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

- **Midterm exam: 20 marks**
- **Practical exam with detailed components: 20 marks**
- **Final exam: 60 marks**

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Review of Medical Physiology by Ganong ,23 rd edition
Main references (sources)	Text book of Medical Physiology by Guyton AC.
Recommended books and references (scientific journals, reports...)	research gate و Google scholar
Electronic References, Websites	YouTube

1. Course Name:					
Organic chemistry					
2. Course Code:					
PcOc1111					
3. Semester / Year:					
First semester 2024-2025					
4. Description Preparation Date:					
2025					
5. Available Attendance Forms:					
In person					
6. Number of Credit Hours (Total) / Number of Units (Total)					
3 hours of theory + 1 hour of practical work (52 hours)					
7. Course administrator's name (mention all, if more than one name)					
Asst. Lecturer Asmaa Idris Fadhil Email: asmaa.edrees@uoturath.edu.iq					
8. Course Objectives					
Course Objectives		Organic Chemistry I: Study and classification of the physical and chemical properties and methods of preparation of alkanes, alkenes, alkynes, alcohols, ethers, and alkyl halides. The course also includes the study of stereochemistry, as well as the identification and understanding of the different types of chemical reactions associated with these compounds..			
9. Teaching and Learning Strategies					
Strategy		Theoretical lectures in the classroom Educational laboratory sessions Conducting scientific studies Various literature-based research activities Weekly seminars, meetings, and homework assignments Scientific research for community service Informative and illustrative videos			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Providing an overview of organic compounds, including their chemical structure, physical	Introduction	Scientific Lectures	Scientific Examinations

		properties, and the types of bonds formed between their molecules or with other different compounds. The course also covers their chemical reactions and applications in various fields , particularly in medical and pharmaceutical fields .			
3-2	6	Understanding the importance of alkanes in organic synthesis and other applications that involve the dissolution of organic compounds.	Alkanes and Methane	Scientific Lectures	Oral Examinations
5-4	5	Familiarity with the chemical properties of alkenes, their applications, and the differences between them and saturated compounds.	Alkenes 1 & 2	Scientific Lectures 33	Oral Discussion
7-6	5	Understanding the properties of alkynes and dienes and their importance in the synthesis of organic compounds and pharmaceuticals.	Alkynes and Dienes	Scientific Lectures	Scientific Examinations
9-8	8	Most drugs are inherently organic	Stereochemistry 1 & 2	Lectures Scientific –	Scientific Examinations

		compounds; therefore, stereochemistry (three-dimensional structure) plays a crucial role in drug action due to the molecular shape. The molecular structure of a drug is an important factor in determining how it interacts with various biological molecules, such as enzymes, receptors, and other biomolecular targets encountered in the body.			
11-10	8	Alcohols are among the most common organic compounds. They serve as key intermediates in the synthesis of other compounds, are widely produced, and are used as solvents for chemical substances in the preparation of pharmaceutical solutions and formulations. Ethers have a broad range of applications, including medical and laboratory uses.	Alcohols and Ethers	Lectures Scientific 34	Scientific Examinations

Grade Distribution (out of 100) Based on Student Assignments and Assessments:

- **Midterm Exam:** 20 marks
- **Practical Exam (with detailed components):** 20 marks
- **Final Exam:** 60 marks

This distribution includes daily preparation, quizzes, oral and written assessments, laboratory reports, and other assigned tasks.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	*Organic Chemistry by Robert T. Morrison and Robert N. Boyd. *Organic Chemistry by McCurry; 5th ed. Thomason learning; CA,USA; 2000
Main references (sources)	*Organic Chemistry by Robert T. Morrison and Robert N. Boyd (المصادر الرئيسية المراجع) *Organic Chemistry by McCurry; 5th ed. Thomason learning; CA,USA; 2000
Recommended books and references (scientific journals, reports...)	Organic Chemistry by Janice Gorzynski Smith, 1st edition
Electronic References, Websites	society chemical American

1. Course Name:	Pharmaceutical Calculation
2. Course Code:	PPhc109
3. Semester / Year:	Second Semester / 2025-2026
4. Description Preparation Date:	2026
5. Available Attendance Forms:	Available (yes)
6. Number of Credit Hours (Total) / Number of Units (Total)	4 Units
7. Course administrator's name (mention all, if more than one name)	Names of theoretical administrator: Assistant prof. Dr. Entidhar Jasim Mohammed Al-Akkam Email: entidhar.jasim@uoturath.edu.iq Lect. Dr . Mustafa Egla Kadim mustafa.egla@uoturath.edu.iq Names of Practical administrator: Msc. Halah Hussein Ali halah.hussien@uoturath.edu.iq

8. Course Objectives	
Course Objectives	By the end of this course, students should be able to: 1. Distinguish between different types of pharmaceutical doses. 2. Describe the main routes of drug administration and the corresponding dosage forms. 3. Perform dose calculations using household measurement systems. 4. Calculate dose quantities, dosing regimens, and the total medication required for a specified treatment duration. 5. Explain the factors influencing dose determination in pediatric and geriatric patients. 6. Calculate doses based on age, body weight, and body surface area (BSA). 7. Use dosing tables and nomograms effectively in calculations. 8. Differentiate between isosmotic, isotonic, hypertonic, and hypotonic solutions. 9. Apply physicochemical principles in the preparation of isotonic solutions. 10. Perform calculations required for compounding isotonic preparations. 11. Determine milliequivalent (mEq) values from atomic or molecular weights. 12. Convert between milligrams and milliequivalents. 13. Solve problems involving milliequivalents, millimoles, and milliosmoles. 14. Perform calculations for modifying product strength through dilution, concentration, or fortification. 15. Prepare and utilize stock solutions in pharmaceutical calculations. 16. Apply alligation methods (medial and alternate) in problem-solving.

9. Teaching and Learning Strategies					
Strategy		• Lectures and presentations • Classroom discussions • Laboratory experiments Active Learning Strategies: • Tuning in (assessing prior knowledge) • Finding out (encouraging inquiry and independent learning) • Sorting out (developing analytical skills) • Developing values • Speaking out (enhancing communication skills) • Reflecting (self-evaluation and conceptual understanding)			
10. Course Structure					
Week	hr.	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	6	• Understanding prescription formats and components • Systems of measurement • Interpreting standard abbreviations and symbols	Interpretation of prescription medication Order	Lectures -Smart Screen -Data show -Power point & pdf Explanatory diagrams	-Written exams -Oral exams -Laboratory Reports
3-4	6	• Concepts of density, specific gravity, and specific volume	Density, specific gravity specific volume	=	=
39					

5- 6	6	- Percentage expressions (w/v, v/v, w/w) - Ratio strength	Percentage ratio strength and concentration expression	Same as above	Same as above
7-8	6	- Dose definitions - Routes of drug administration and dosage forms - Dose calculations based on age, weight, and BSA - Perform calculations to reduce or enlarge formulas pharmaceutical preparations stated in metric quantities.	- Calculation of doses - Doses based on patient parameters - Reducing and enlarging	Same as above	Same as above
9	3	- Adjusting product strength in compounding - Dilution and concentration of liquids - Stock solutions - Application of alligation method	- Altering Prod Strength, - Us Stock Solution and Problem- Solving by Alligation		
10-11	6	- Clinical and physicochemical aspects of isotonic solutions - Buffer solutions	-Isotonic solution -Buffer solutions -		
12-13	6	- Electrolyte solutions (mEq, mmol, mOsm) - Water and electrolyte balances.	- Electrolytes solutions		

14-15	6	• Intravenous infusion calculations (adult and pediatric) • Intravenous additives • Flow rate calculations and use of nomograms	- Intravenous Infusions, - Parenteral Admixtures -Rate-of-Flow Calculations		
	45 h	Total hours			

11. Course Evaluation	
The final grade (out of 100) is distributed based on: • Daily preparation • Oral examinations • Mid-term exam. • Final exam • Laboratory reports and assessments	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Pharmaceutical Calculations; 15 th edition (2017) by Howard C. Ansel
Main references (sources)	Pharmaceutical calculation 3 rd edition by Ansel
Recommended books and references (scientific journals, reports...)	Pharmaceutical Calculations: A Conceptual Approach. 2019.
Electronic References, Websites	https://www.nps.org.au/assets/e1522a550c298d28-18d3eafe5ce1-Extemporaneously-compounded-medicines_40-119.pdf http://repo.upertis.ac.id/1819/1/FASTtrack%20Pharmaceutical%20Compounding%20and%20Dispensing.pdf

1. Course Name:					
Computer Sciences					
2. Course Code:					
106 ClCs					
3. Semester / Year:					
First/First					
4. Description Preparation Date:					
2026/3/22					
5. Available Attendance Forms:					
In-person attendance					
6. Number of Credit Hours (Total) / Number of Units (Total):					
2/2					
7. Course administrator's name (mention all, if more than one name)					
1- Name: Assist.Lec. Sally Mazen Saad Email: sally.mazen@uoturath.edu.iq					
8. Course Objectives					
Course Objective		The course is designed to provide a thorough overview of the fundamental concepts of computer applications. It covers the use of Microsoft Word, Microsoft Power point, and Google applications in detail.			
9. Teaching and Learning Strategies					
Strategy		1-Lectures and Presentation 2-Discussions			
10. Course Structure					
Week	Hours	Required Outcomes	Learning Unit or subject name	Learning method	Evaluation method
1	2	Using Google applications	Introduction to Microsoft Word (File and Home Tab)	- Lectures -Power point presentations -Scientific	-Written exams - Oral exams -Laboratory reports
				YouTube videos -laboratory experiments	

2	2	Use the tape to insert mathematical equations and graphs	Insert tab	=	=
3	2	Use tape to layout the paper	Layout Tab	=	=
4	2	The References Tab allows you to now create a table of contents, footnotes, citations, cross-references	References Tab	=	=
5	2	Use the Mailing Bar to send	Mailings Tab	=	=
6	2	The use of tape in the meanings of paper and the use of tools in translation	Review Tab	=	=
7	Midterm examination				
8	2	The use of tape in the meanings of paper and the use of tools in translation	View Tab	=	=
9	2	Create, edit, save, and print presentations	Introduction to Microsoft PowerPoint	44 =	=
10	2	Create, edit, save, and print presentations	File and Home Tab	=	=
11	2	Add a graphic to a	Insert tab	=	=

		presentation. Create slide presentations that include text, graphics, animation, and transitions			
12	2	Use design layouts and templates for presentations.	Design	=	=
13	2	Control the speed, add sound, and customize the look of transition effects.	Transition Tab, Slide View	=	=
14 and 15	4	The most common types of animation effects include entrances and exits. Adding sound to increase the intensity of the animation effects.	Animation Tab , Review Tab , View Tab	=	=

11.Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily practical, monthly practical or written exams, and reports

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Microsoft office Professional 2019, BY Linda Foulkes, Senior Editor: Afshaan Khan ISBN 978-1-83921-725-8
Main references (sources)	45
Recommended books and references (scientific journals, reports...)	Microsoft office Professional 2010, BY Joyce Cox, Jo an Lambert & Curtis Frge
Electronic References, Websites	

13. Course Name:	
Organic chemistry II	
14. Course Code:	
PcOc2216	
15. Semester / Year:	
First semester 2024-2025	
16. Description Preparation Date:	
2025	
17. Available Attendance Forms:	
In person	
18. Number of Credit Hours (Total) / Number of Units (Total)	
3 hours of theory + 1 hour of practical work (52 hours)	
19. Course administrator's name (mention all, if more than one name)	
Name: Prof. Dr. Yousif Kazem Abdul Ameer Email: yousif.kazem@uoturath.edu.iq Asst. Lecturer Asmaa Idris Fadhil Email: asmaa.edrees@uoturath.edu.iq	
20. Course Objectives	
Course Objectives	* Establishing the scientific foundations of pharmaceutical organic chemistry through the study of functional groups and organic compounds relevant to medicinal use. * Introducing students to the properties and classifications of organic compounds, with emphasis on chemical structure, systematic nomenclature, and structure–function relationships. * Understanding the fundamental mechanisms of organic reactions and the structural changes that occur in compounds, and correlating these with pharmaceutical applications. * Identifying aromatic compounds and their derivatives in terms of structure, properties, and pharmacological significance. * Studying heterocyclic compounds and elucidating their pivotal role in drug design and development. * Acquiring skills in qualitative analysis and differentiation of organic compounds using common chemical tests. * Integrating organic chemistry with other pharmaceutical sciences to support comprehension of subsequent courses. * Preparing students to understand the chemical principles of drug design and development, serving future pharmaceutical practice.
21. Teaching and Learning Strategies	

Strategy	* Delivering the scientific content gradually and systematically that considers students' prior knowledge, with emphasis on the fundamental concepts of organic chemistry relevant to pharmaceutical applications. * Developing students' analytical and critical thinking skills through discussion of reaction mechanisms, interpretation of results, and correlation between chemical structure, properties, and pharmacological activity. * Promoting active learning by engaging students in classroom discussions, problem solving, and analysis of real-world pharmaceutical examples. * Effectively utilizing the teaching laboratory to apply theoretical concepts in practice, with strong emphasis on laboratory safety rules and accuracy in experimental performance. * Employing **modern educational tools, such as presentations and visual models, to simplify molecular structures and organic reactions. * Encouraging self-directed and collaborative learning through homework assignments, preparation of laboratory reports, and short individual or group research projects.				
22.	Course Structure				
We ek	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-4	10	Aromatic hydrocarbons of pharmaceutical importance, such as toluene and xylene (ortho-, meta-, and para-isomers), which are industrially produced in large quantities and are used in the synthesis of numerous pharmaceutical compounds.	Aromatic Compounds	Scientific Lectures 47	Scientific Examinations
5-7	12	Many organic drugs used in the pharmaceutical industry contain acidic carboxyl (–COOH) groups.	Carboxylic Acids	Scientific Lectures	Oral Examinations
8-9	5	The importance of amines arises from	Amines	Scientific Lectures	Oral Discussion

		their presence in the human body and their essential role in normal biological processes.			
10-13	12	Aldehydes and ketones are used in the chemical industry as reagents, solvents, and starting materials for the synthesis of various compounds.	Aldehydes and Ketones	Scientific Lectures	Scientific Examinations
14-15	5	Plant phenols are considered an essential dietary component for humans and exhibit antioxidant activity , in addition to other health benefits.	Phenols	Lectures – Scientific	Scientific Examinations

23. Course Evaluation

Grade Distribution (out of 100) Based on Student Assignments and Assessments:

- **Midterm Exam:** 20 marks
- **Practical Exam (with detailed components):** 20 marks
- **Final Exam:** 60 marks

This distribution includes daily preparation, quizzes, oral and written assessments, laboratory reports, and other assigned tasks.

40

24. Learning and Teaching Resources

Required textbooks (curricular books, if any)	*Organic Chemistry by Robert T. Morrison and Robert N. Boyd. *Organic Chemistry by McCurry; 5th ed. Thomason learning; CA,USA; 2000
Main references (sources)	*Organic Chemistry by Robert T. Morrison and Robert N. Boyd.) *Organic Chemistry by McCurry; 5th ed. Thomason learning; CA,USA; 2000

Recommended books and references (scientific journals, reports...)	*Organic Chemistry by Janice Gorzynski Smith, 1st edition.
Electronic References, Websites	https://www.sciencedirect.com/book/9780128128381/organicchemistry

[illegible]

2	3	Physiology of bacterial cell, bacterial growth and bacterial requirement, bacterial growth curve Practical: staining of Bacteria	Bacterial growth Requirements	=	=
3	3	Genetics definition of nucleic acids. Genetic codes and types of mutations Methods of transferring genetic material, biotechnology Recombinant DNA Practical: Bacterial Movement	Bacterial genetics	=	=
4	3	Types of beneficial bacteria in the various internal organs of a living organism Practical: staining of spores and its position	Normal Flora	=	=
5	3	Types of Gram-positive bacteria and identifying the virulence factors of each bacteria Practical: preparation and sterilization of media	Gram positive Staphylococcus Streptococcus Corynebacterium	=	=
6	3	Chemotherapy (antibiotics, etc.) Practical: isolation of bacterial colonies	Bacillus Clostridium	=	=
7Mid-term examination					
8	3	Types of Gram-negative bacteria and knowledge of virulence factors, toxins, and different proteins Practical: identification of bacterial colonies	Gram-negative <i>Neisseria</i> <i>Enteroba.</i> , <i>E. coli</i>	=	=
9	3	Different intestinal bacteria, knowledge	<i>Salmonella</i> <i>Shigella</i>	=	=

		of virulence factors, and types of infections according to species. Practical: biochemical reaction; oxidase and catalase test	<i>Klebsiella</i> <i>Proteus</i>		
10	3	Non-intestinal <i>Pseudomonas</i> species and <i>Vibrio</i> bacteria Practical: biochemical reaction; urease activity	Non-enteric <i>Pseudomonas</i> and <i>Vibrio</i>	=	=
11	3	The causes of brucellosis, whooping cough, respiratory infections, stomach cancer, and bacterial diarrhea. Practical: bacterial reaction to citrate	<i>Brucella</i> , <i>Bordetella</i> <i>Hemophilus</i> <i>H. pylori</i> and <i>Campylobacter</i>	=	=
12	3	Understanding the causes of syphilis, plague, and pulmonary tuberculosis Practical: IMVEC test	<i>Treponema</i> , <i>Yersinia</i> <i>Actinomycetes</i> <i>Mycobacteria</i>	=	=
13	3	The basic principles of antibiotic resistance and its management, and an explanation of the basic principles of recombinant biotechnology and DNA technology. Practical: identification of lactose fermenter and non-lactose fermenter bacteria	Antimicrobial stewardship and Recombinant biotechnology	=	=
14	3	Bacteriophages are viruses that infect bacteria and various types of bacterial toxins. Practical: identification	Phage and toxins	=	=

		of lactose fermenter and non-lactose fermenter bacteria			
15	3	Beneficial microorganisms, indigestible food compounds, and active metabolites produced by bacteria Practical: antibiotics sensitivity test	Probiotics, prebiotics and postbiotics	=	=
11. Course Evaluation					
Mid-term examination (15 marks) Quiz and homework (5 marks) Practical work (20 marks) Final examination (60 marks)					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Lippincotts illustrated review microbiology, 2nd ed. -A color Atlas of microbiology by Ronald John Olds -Jawetz, Melnick, & Adelberg's. Medical Microbiology 26th ed.		
Main references (sources)					
Recommended books and references (scientific journals, reports...)			-Bailey & Scott's Diagnostic Microbiology 14th ed. -Hugo and Russell's Pharmaceutical Microbiology; 8th. ed.		
Electronic References, Websites					

1. Course Name:	
Physical Pharmacy I	
2. Course Code:	
Physical Pharmacy I / 1218 PPp2	practical physical pharmacy 1/ph2
3. Semester / Year:	
1st Semester 2025-2026	
4. Description Preparation Date:	
12/2025	
5. Available Attendance Forms:	
On campus	
6. Number of Credit Hours (Total) / Number of Units (Total):	
3 hours/week (Theory) , 2hours/ week (Practical), Total units=4	
7. Course administrator's name (mention all, if more than one name)	
Name:Dr. Ihsan khudhair Email: ihsan_khudhair@uoturath.edu.iq Name: Assist. Lecturer Othman Farooq Email: Othman Farooq@uoturath.edu.iq	
8. Course Objectives	
Course Objectives	1- Physical pharmacy integrates knowledge of mathematics, physics and chemistry and applies them to pharmaceutical dosage form development 2- provides the basis for understanding chemical and physical phenomena that govern actions of pharmaceutical products, enabling rational decisions on dosage forms
9. Teaching and Learning Strategies	
Strategy	1-Lectures and Presentation 2-Discussions 3- Laboratory experiments 4- Inverted classrooms

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3 Theory 2 Practical	-To understand the concepts of solubility, factors affecting solubility, types of solvents - solubility of gases	Solubility and distribution phenomena,	- Lectures -White board -Data show -Power point -Explanatory diagrams -Scientific YouTube videos -laboratory experiments	Written exams - Oral exams -Laboratory reports
2	3 Theory 2 Practical	To understand factors affecting the solubility of liquids and those affecting ideal solubility of solids Understand the factors affecting the solubility of different types of solids	Solubility of liquids in liquids and Ideal and non- ideal solubility of solids in liquids,. Solubility of salts, weak electrolytes	55	
3	3 Theory 2 Practical	Understand the phenomena of extraction and preservation	Distribution of solutes between immiscible solvents		
4	3 Theory 2 Practical	Understand the differences in binding forces and their relevance to different types molecules. Knowledge of the properties of the gas and liquid states of matter	States of matter, binding forces between molecules, Gases, and liquids states		
5	3 Theory 2 Practical	Describe the solid state, crystallinity, solvates, and polymorphism	Solid state		
6	3 Theory 2 Practical	Understand phase equilibria and phase transitions between the three main states of matter	Phase equilibria and phase rule; thermal analysis		

7	3 Theory 2 Practical	Understand the properties of non-electrolyte solutions	Solutions of non-electrolytes,		
8	3 Theory 2 Practical	Define ideal and real solutions using Raoult's law	Ideal and real solutions,		
9	3 Theory 2 Practical	Identify and describe the four colligative properties of non-electrolytes in solution	Colligative properties of non-electrolytes.		
10	3 Theory 2 Practical	-Understand the important properties of solutions of electrolytes -Compare and contrast the colligative properties of electrolytic solutions and solutions of nonelectrolytes	Solution of electrolytes.		
11	3 Theory 2 Practical	Describe the Brönsted - Lowry and Lewis electronic Theories Identify and define the four classifications of solvents	Ionic equilibria, modern theories of acids, bases and salts, acid-base equilibria,		
12	3 Theory 2 Practical	To understand the concept of acid- base equilibrium -Apply the buffer equation as the Henderson–Hasselbalch equation, for a weak acid or base and its salt - Determination of buffer capacity	Proton balance equation Buffered solutions		
13	3 Theory 2 Practical	Learn how to prepare Pharmaceutical buffers Describe the concept of tonicity and its importance in pharmaceutical systems	Preparation of buffer solutions isotonic solutions and methods of adjusting tonicity	56	

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Martin's Physical Pharmacy and Pharmaceutical Sciences: Physical Chemical and Biopharmaceutical Principles in Pharmaceutical Sciences, 6th Edition
Main references (sources)	Text Book mentioned above
Recommended books and references (scientific journals, reports...)	Florence AT, Attwood D. FASTtrack: Physical Pharmacy. Pharmaceutical Press; 2008
	Almoazen H. Felton L.: Remington: Felton Essentials of pharmaceuticals. 2012.
Electronic References, Websites	

25. Course Name:					
Physiology1					
26. Course Code:					
Ptp13219					
27. Semester / Year:					
First semester 2025-2026					
28. Description Preparation Date:					
2025					
29. Available Attendance Forms:					
Attendance					
30. Number of Credit Hours (Total) / Number of Units (Total)					
3hr theoretical + 1 hr practical					
31. Course administrator's name (mention all, if more than one name)					
Name: Lecturer Dr. Mariam H. Sadiq Assist lecturer Maryam Saleem Mohammed Ali Email: mariam.hadi@uoturath.edu.iq maryam.saleem@uoturath.edu.iq					
32. Course Objectives					
Course Objectives		• Study of human cells and the mechanisms of biomolecule transport within the cell. • Study of the nervous system and the processes of neural signal transmission. • Study of human muscles and their functional mechanisms. • Study of the urinary system and its role in regulating blood pressure. • Study of the respiratory system and the mechanisms maintaining optimal oxygen levels.....			
33. Teaching and Learning Strategies					
Strategy		• Utilizing additional diagrams and illustrations beyond the curriculum. • Referring to educational YouTube resources. • Conducting periodic examinations as previously agreed.			
34. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	6 2	The theoretical part covers cell composition and the cellular transport system, while the practical part focuses on blood physiology and blood grouping techniques	Cell composition and transport system practical part: physiology of blood & blood grouping	• PowerPoint presentations • Laboratory experiments	preparing reports, completing assignments, and participating in both oral and written examination

3-6	12 3	Nervous system physiology Practical part: : measurement of the bleeding time and clotting time	• Study of the nervous system and the mechanisms of neural signal transmission • Study of blood coagulation factors	• PowerPoint presentations • Laboratory experiments	preparing reports, completing assignments, and participating in both oral and written examination
7-9	12 3	Skeletal muscle+ smooth muscle + cardiac muscle Practical part: estimation of hemoglobin & determination of blood glucose level	Study of human muscles and the mechanism of muscle contraction(smooth ,skeletal & cardiac muscle) Study of anemia Study of diabetes and its types	• PowerPoint presentations • Laboratory experiments	preparing reports, completing assignments, and participating in both oral and written examination
10-12	6 2	Physiology of renal system Practical part: determination of blood pressure & measurement of body temperature	The study includes the urinary system and practical methods for measuring blood pressure and body temperature.	• PowerPoint presentations • Laboratory experiments •	preparing reports, completing assignments, and participating in both oral and written examination
13-15	6 2	Respiratory system physiology Practical part: Determination of Respiratory rate and lung volumes	Study of the respiratory system and the mechanisms for maintaining optimal oxygen levels	• PowerPoint presentations • Laboratory experiments •	preparing reports, completing assignments, and participating in both oral and written examination

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35. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

- **Midterm exam: 20 marks**
- **Practical exam with detailed components: 20 marks**
- **Final exam: 60 marks**

36. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Review of Medical Physiology by Ganong ,23rd edition

Main references (sources)	Text book of Medical Physiology by Guyton AC.
Recommended books and references (scientific journals, reports...)	research gate و Google scholar
Electronic References, Websites	YouTube

37.	Course Name:					
Medical Microbiology II						
38.	Course Code:					
CIMv224						
39.	Semester / Year:					
Second /Second						
40.	Description Preparation Date:					
2025						
41.	Available Attendance Forms:					
In -person attendance						
42.	Number of Credit Hours (Total) / Number of Units (Total)					
30/4						
43.	Course administrator's name (mention all, if more than one name)					
Name: Assist. Prof. Zaid Khalid Ahmed Zaid.khaled@uoturath.edu.iq Assist. Lecturer. Luma Issah Hamoodi loma.essa@uoturath.edu.iq Assist. Lecturer. Bakir Emad Najim Bakr.imad.najm@uoturath.edu.iq						
44.	Course Objectives					
Course Objectives		• Educating pupils about the most significant causes, vectors, and treatments for parasite and viral diseases that impact human health. • Giving pupils a fundamental understanding of the immune system, its parts, and how it functions, as well as talking about the most significant immune system disorders and the causes of dysfunction that result in them.				
45.	Teaching and Learning Strategies					
Strategy	5. Research and induction 6. Interactive conversations 7. Brainstorming 8. Presentation and recitation					
46.	Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method	
1	2	An overview of human parasite infections and their classification Practical: Introduction and classification of the human parasites	Introduction to human parasite & taxonomy	Lectures, Discussions, and Reports 61	Exam and classroom activities	
2	2	The study of <i>Entamoeba histolytica</i> is essential for understanding intestinal protozoal infections, enabling accurate diagnosis, appropriate treatment Practical:	Protozoa/Sarcodina : intestinal (<i>Entamoeba histolytica</i>)	=	=	

		Protozoa: Intestinal: <i>Entamoeba histolytica</i>			
3	2	The study of <i>Entamoeba coli</i> is important for understanding commensal intestinal amoebae, helping to differentiate non-pathogenic species from pathogenic ones Practical: Commensal amoeba; <i>Entamoeba coli</i> ;	Commensally intestinal amoeba: (<i>Entamoeba coli</i>)	=	=
4	3	The study of <i>Giardia lamblia</i> and <i>Trichomonas</i> is essential for understanding intestinal flagellate infections, enabling accurate diagnosis, effective treatment, and prevention Practical: <u>Protozoa/Mastigophora</u> : Intestinal flagellates: <i>Giardia lamblia</i>	Protozoa/Mastigophora : Intestinal flagellates: (<i>Giardia lamblia</i>), Genital flagellates: (<i>Trichomonas vaginalis</i>)	=	=
5	3	The study of <i>Leishmania</i> spp. and <i>Trypanosoma</i> spp. is essential for understanding blood and tissue flagellate infections, supporting accurate diagnosis Practical: Flagellate of blood and tissues: <i>Leishmania</i> spp and <i>Trypanosoma</i>	Blood and tissue flagellates: (<i>Leishmania</i> spp. & <i>Trypanosoma</i> spp.)	=	=
6	2	The study of <i>Plasmodium</i> spp. is essential for understanding malaria pathogenesis, enabling accurate diagnosis, effective antimalarial therapy Practical: Protozoa/ Sporozoa :Blood Sporozoa: Malarial parasite: <i>Plasmodium</i> Spp	Protozoa/ Sporozoa (Apicomplexa): Blood Sporozoa: (<i>Plasmodium</i> Spp.)	= 62	=
7Mid-term examination					
8	2	The study of <i>Toxoplasma gondii</i> and <i>Balantidium coli</i> is essential for understanding tissue and ciliate protozoal infections, enabling accurate diagnosis	Tissue Sporozoa: (<i>Toxoplasma gondii</i>), Protozoa/ Ciliophora: (<i>Balantidium coli</i>)	=	=

		Practical: Tissue Sporozoa: Toxoplasma gondii and Balantidium coli			
9	2	The study of cestodes (<i>Taenia</i> spp., <i>Hymenolepis</i> spp., and <i>Echinococcus</i> spp.) is essential for understanding tapeworm infections, supporting accurate diagnosis, effective treatment Practical: Metazoa: Platyhelminthes :Cestoda: (<i>Taenia</i> spp.)	Metazoa: Platyhelminthes (flatworms): Cestoda (tapeworms) : (<i>Taenia</i> spp.), <i>Hymenolepis</i> spp, <i>Echinococcus</i> spp	=	=
10	2	The study of trematodes (<i>Schistosoma</i> spp. and <i>Fasciola hepatica</i>) is essential for understanding blood and hepatic fluke infections, enabling accurate diagnosis Practical: Blood flukes (<i>Schistosoma</i> spp.),, Hepatic flukes: (<i>Fasciola hepatica</i>)	Trematoda (flukes): Blood flukes (<i>Schistosoma</i> spp.),, Hepatic flukes: (<i>Fasciola hepatica</i>)	=	=
11	2	The study of nematodes (<i>Ascaris lumbricoides</i> , <i>Trichuris trichiura</i> , <i>Enterobius vermicularis</i> , and <i>Ancylostoma duodenale</i>). Practical: <i>Ascaris lumbricoides</i> , <i>Trichuris trichiura</i> , <i>Enterobius vermicularis</i> , <i>Ancylostoma duodenale</i>	Metazoa: Nemathelminthes (roundworms): Nematoda: (<i>Ascaris lumbricoides</i> , <i>Trichuris trichiura</i> , <i>Enterobius vermicularis</i> , <i>Ancylostoma duodenale</i>	=	=
12	2	The study of virology, including viral characteristics, replication, propagation, one-step growth curve, and antiviral drugs, is essential for understanding virus biology Practical: Introduction to Virology & General characteristics of virus, Viral replication	Introduction to Virology & General characteristics of virus, Viral replication Propagation of viruses & one step growth curve, Antiviral drugs	= 63	=

13	2	The study of viral genetics and classification, including DNA and RNA viruses, is essential for understanding viral diversity, replication strategies, and guiding accurate diagnosis. Practical: Classifications of viruses, DNA and RNA viruses	Genetic interaction & Classifications of viruses, DNA and RNA viruses	=	=
14	2	The study of human pathogenic fungi, including opportunistic mycoses (<i>Candidiasis</i> , <i>Aspergillosis</i>) and infections of keratinized tissues. Practical: Classify fungi causing human infections. Opportunistic Mycosis	Classify fungi causing human infections. Opportunistic Mycosis – <i>Candidiasis</i> , <i>Aspergillosis</i> , Infections of keratinized tissues e.g. Skin, hair & nails.– <i>Pityriasis</i> Vesicolor, white piedra, black piedra, tinea nigra, <i>Malassezia</i> species, dermatophytes	=	=
15	2	The study of systemic pathogenic fungi (<i>Histoplasmosis</i> , <i>Blastomycosis</i> , <i>Coccidioidomycosis</i>) is essential for understanding serious fungal infections Practical: <i>Histoplasmosis</i> , <i>Blastomycosis</i> , <i>Coccidioidomycosis</i>	Fungi causing systemic diseases. - <i>Histoplasmosis</i> , <i>Blastomycosis</i> , <i>Coccidioidomycosis</i>	=	=

47. Course Evaluation

Mid-term examination (15 marks) Quiz and homework (5 marks) Practical work (20 marks) Final examination (60 marks)

48. Learning and Teaching Resources

Required textbooks (curricular books, if any)	-Medical Microbiology 24th ed. 2007 by E. Jawetz - Medical parasitology, 5th ed. By Dr. D.R. Arora & Dr. Brij Bala Arora. 2018 - Lab manual for practical virology and parasitology, - Atlas of Helminthes and Protozoa
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:	
Physical Pharmacy II	
2. Course Code:	
Physical Pharmacy II / 225 PPp2	practical physical pharmacy 1/ph2
3. Semester / Year:	
2st Semester 2025-2026	
4. Description Preparation Date:	
1/2025	
5. Available Attendance Forms:	
On campus	
6. Number of Credit Hours (Total) / Number of Units (Total):	
3 hours/week (Theory) , 2hours/ week (Practical), Total units=4	
7. Course administrator's name (mention all, if more than one name)	
Name:Dr. Ihsan khudhair Email: ihsan.khudhair@uoturath.edu.iq Name: Assist. Lecturer Othman Farooq Email: Othman.Farooq@uoturath.edu.iq	
8. Course Objectives	
Course Objectives	3- Physical pharmacy integrates knowledge of mathematics, physics and chemistry and applies them to pharmaceutical dosage form development 4- provides the basis for understanding chemical and physical phenomena that govern actions of pharmaceutical products, enabling rational decisions on dosage forms
9. Teaching and Learning Strategies	
Strategy	1-Lectures and Presentation 2-Discussions 3- Laboratory experiments 4- Inverted classrooms

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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3 Theory 2 Practical	Complexation (Chapter 10)• Classification of complexes• Metal complexes• Organic molecular complexes•		- Lectures -White board -Data show -Power point -Explanatory diagrams -Scientific YouTube videos	Written exams - Oral exams -Laboratory reports
2	3 Theory 2 Practical	Inclusion compounds• Methods of analysis Diffusion (Chapter 11)• Introduction• Steady state diffusion• Fick's first law of diffusion• Fick's second law• Diffusion through membranes		-laboratory experiments	
3	3 Theory 2 Practical	Permeability• Diffusion driving forces• Lag time• Apparatus and methods for assessing drug diffusion			
4	3 Theory 2 Practical	Chemical kinetics and stability (Chapter 14)• Introduction• Rates, orders and molecularity of reactions			
5	3 Theory 2 Practical	Temperature effects• Other factors effects			
				66	

6	3 Theory 2 Practical	Stability of pharmaceuticals• Accelerated stability and stress testing			
7	3 Theory 2 Practical	Interfacial phenomena (Chapter 15)• Classification of interfaces• Liquid interfaces• Surface and interfacial tensions• Surface free energy• Measurement of interfacial tension			
8	3 Theory 2 Practical	Spreading coefficient• Adsorption at liquid interfaces• Surface active agents• Systems of Hydrophile–Lipophile Classification• Adsorption at solid interfaces• The solid gas interface• The solid liquid interface			
9	3 Theory 2 Practical	Wetting and wetting agents• Applications of surface-active agents• Foam and antifoaming agents• Electric properties of interfaces			
10	3 Theory 2 Practical	Rheology (Chapter 19)• Newtonian systems• Non-Newtonian systems• Thixotropy			
11	3 Theory 2 Practical	Determination of rheological properties• Viscoelasticity• Pharmaceutical areas in which rheology is Significant		67	

12	3 Theory 2 Practical	Colloidal dispersions (Chapter 16)• Introduction to disperse systems• Types of colloidal systems• Optical properties of colloids• Kinetic properties of colloids			
13	3 Theory 2 Practical	• Electrical properties of colloids• Solubilization using colloids• Pharmaceutical applications of colloids			
14	3 Theory 2 Practical	Micrometrics (Chapter 18)• Particle size and size distribution• Methods of determining particle size• Particle shape and surface area• Methods for determining surface area• Derived properties of powders (porosity, packing arrangements, densities of particles, bulkiness and flow properties)			
15	3 Theory 2 Practical	Pharmaceutical polymers (Chapter 20)• Introduction (history, general concepts, synthesis)• Copolymers and polymer blends• Thermoplastic and thermoset polymers• Polymer properties (crystalline and amorphous polymers, thermal transitions, glass transition temperature, plasticized polymers, molecular weight, mechanical properties,• Polymers for pharmaceutical applications• Polymers in drug delivery		68	

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11. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Martin's Physical Pharmacy and Pharmaceutical Sciences: Physical Chemical and Biopharmaceutical Principles in Pharmaceutical Sciences, 6th Edition
Main references (sources)	Text Book mentioned above
Recommended books and references (scientific journals, reports...)	Florence AT, Attwood D. FASTtrack: Physical Pharmacy. Pharmaceutical Press; 2008
	Almoazen H. Felton L.: Remington: Felton Essentials of pharmaceutics. 2012.
Electronic References, Websites	

49. Course Name:					
PhysiologyII					
50. Course Code:					
Ptph2226					
51. Semester / Year:					
second semester 2025-2026					
52. Description Preparation Date:					
2025					
53. Available Attendance Forms:					
Attendance					
54. Number of Credit Hours (Total) / Number of Units (Total)					
3hr theoretical + 1 hr practical					
55. Course administrator's name (mention all, if more than one name)					
Name: Lecturer Dr. Mariam H. Sadiq Assist lecturer Maryam Saleem Mohammed Ali Email: mariam.hadi@uoturath.edu.iq maryam.saleem@uoturath.edu.iq					
56. Course Objectives					
Course Objectives		• Study of blood cells and their differentiation • Study of the functioning of endocrine glands • Study of the digestive system and its functions • Study of blood functions and the ABO blood group system			
57. Teaching and Learning Strategies					
Strategy		• Utilizing additional diagrams and illustrations beyond the curriculum. • Referring to educational YouTube resources. • Conducting periodic examinations as previously agreed.			
58. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-5	15 5	Physiological study of endocrine system practical part: White blood cell count & their differential types	The study covers the mechanisms, functions, and roles of endocrine glands, along with practical training in counting white blood cells, assessing their normal ranges, and distinguishing between their different types.	• PowerPoint presentations • Laboratory experiments	preparing reports, completing assignments, and participating in both oral and written examination
6-8	9 3	Thyroid gland ,pituitary gland	Study of thyroid gland function and the effects of its hormones on the	• PowerPoint presentations	preparing reports, completing assignments, and

		Practical part: Platelet count	body, as well as the pituitary gland Learning to count platelets and understand disorders related to platelet count	Laboratory experiments	participating in both oral and written examination
8-13	15 5	Physiology of digestive system Practical part: RBC count	Study of digestive system functions and the process of digestion Learning methods for counting red blood cells	PowerPoint presentations Laboratory experiments	preparing reports, completing assignments, and participating in both oral and written examination
14-15	6 2	Physiology of blood Practical part: Determination of Hematocrit (Hct)	study the components of blood and its cellular elements, with particular emphasis on red blood cells, their physiological functions in the human body, and the diseases associated with them.	PowerPoint presentations Laboratory experiments	preparing reports, completing assignments, and participating in both oral and written examination

59. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

- **Midterm exam: 20 marks**
- **Practical exam with detailed components: 20 marks**
- **Final exam: 60 marks**

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60. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Review of Medical Physiology by Ganong ,23 rd edition
Main references (sources)	Text book of Medical Physiology by Guyton AC.
Recommended books and references (scientific journals, reports...)	research gate و Google scholar
Electronic References, Websites	YouTube

1. Course Name:					
Pharmacognosy I					
2. Course Code:					
3. Semester / Year:					
2 nd semester/ 2 nd year					
4. Description Preparation Date:					
12/2025					
5. Available Attendance Forms:					
attendance					
6. Number of Credit Hours (Total) / Number of Units (Total)					
5/4					
7. Course administrator's name (mention all, if more than one name)					
Name: Rasha A. Eldalawy Email: rasha.eldalawy@uoturath.edu.iq					
Name: Asmaa Mahdi Email: asmaa.mahdi@uoturath.edu.iq					
8. Course Objectives					
Course Objectives		To know the concept of pharmacognosy , the methods of extractions and the basic Of chromatography and its types			
9. Teaching and Learning Strategies					
Strategy		Lectures and presentation Discussion and analysis Research and readings			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3hr	Definition	General introduction of Pharmacognosy	Theoretical lectures	Oral examination And discussion
2	3hr	Definition and using	Sources of natural drugs, natural drugs, official and non official drugs	Theoretical lectures	Oral examination and discussion
3	3hr	Definition and using	Classification of natural products	Theoretical lectures	Oral examination And discussion
4	3hr	Definition and using	Plant nomenclature and classification	Theoretical lectures	Oral examination And discussion
5	3hr	Definition	Cultivation, collection, drying, and storing of natural drugs	Theoretical lectures	Oral examination And discussion
6	3hr	Definition and using	Degradation of natural products	Theoretical lectures	Oral examination And discussion
7	3hr	Definition and using	The pharmacological effectiveness of natural products	Theoretical lectures	Oral examination And discussion

8	3hr	Definition and using	Phytochemistry of natural products	Theoretical lectures	Oral examination And discussion
9	3hr	Definition and classification	Quality control: evaluation of natural products microscopically, physically, chemically, biologically, and spectroscopically	Theoretical lectures	Oral examination And discussion
10	3hr	Definition and application	Separation techniques: introduction, separation mechanism, classifications depending on type of techniques	Theoretical lectures	Oral examination And discussion
11	3hr	Definition and technique	TLC	Theoretical lectures	Oral examination And discussion
12	3hr	Definition and technique	Gel chromatography	Theoretical lectures	Oral examination And discussion
13	3hr	Definition and technique	Column chromatography	Theoretical lectures	Oral examination And discussion
14	3hr	Definition and technique	Gas chromatography	Theoretical lectures	Oral examination And discussion
15	3hr	Definition and application	Plant Tissue culture	Theoretical lectures	Oral examination And discussion

Course structure of Pharmacognocny I/ Practical / 2nd stage / 2nd course

Week	Hrs.	Required learning outputs	Subject or Unit title	Teaching style	Estimation ways
1	2hr	Technique and use	Medicinal plants	practical	Oral and written exams, reports and discussion.
2	2hr	Technique and use	Microscopical examination of natural products and cell contents	practical	Oral and written exams, reports and discussion.
3	2hr	Technique and use	Types of starches	practical	Oral and written exams, reports and discussion.
4	2hr	Technique and use	Extraction and separation techniques	practical	Oral and written exams, reports and discussion.
5	2hr	Technique and use	chromatography	practical	Oral and written exams, reports and discussion.
6	2hr	Technique and use	Paper chromatography	practical	Oral and written exams, reports and discussion.

7	2hr	Technique and use	TLC	practical	Oral and written exams, reports and discussion.
8	2hr	Technique and use	TLC on microscope slides	practical	Oral and written exams, reports and discussion.
9	2hr	Technique and use	Color separation for volatile oil	practical	Oral and written exams, reports and discussion.
10	2hr	Technique and use	Column chromatography	practical	Oral and written exams, reports and discussion.
11	2hr	Technique and use	Effect of adsorbent on Rf values	practical	Oral and written exams, reports and discussion.

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1. Pharmacognosy and Pharmacobiotechnology by Tyler, 1996. (For theoretical) 2. Practical manual, college of pharmacy / Baghdad University. (For practical)
Main references (sources)	Fundamentals of pharmacognosy and phytotherapy.
Recommended books and references (scientific journals, reports...)	Research and reviews journal of Pharmacognosy and phytochemistry أساسيات علم العقاقير والعلاج النباتي
Electronic References, Websites	Google scholar, research gate

61. Course Name:

Organic chemistry III

62. Course Code:

63. Semester / Year:

Second semester 2025-2026

64. Description Preparation Date:

2026

65. Available Attendance Forms:

In Person

66. Number of Credit Hours (Total) / Number of Units (Total)

2 hours of theory + 2hour of practical work (60 hours)

67. Course administrator's name (mention all, if more than one name)

Name: Prof. Dr. Yousif Kadim Abdul Ameer

Email: yousif.kadim@uoturath.edu.iq

Name: Asst. Lecturer Safa Adnan

Email: safa.adnan@uoturath.edu.iq

68. Course Objectives

Course Objectives	1 • Learn what heterocyclic compounds are
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	(rings containing atoms like N, O, or S besides carbon). • Study their classification, structures, properties, and occurrence in nature and medicines. 2. Study five-membered heterocycles • Learn the structure and chemistry of pyrrole, furan, and thiophene. 3. Know their sources • Understand where pyrrole, furan, and thiophene are obtained from naturally or industrially. 4. Understand electrophilic substitution reactions • Study reactivity and orientation of substitution reactions in pyrrole, furan, and thiophene. 5. Study six-membered heterocycles Learn the structure and reactions of pyridine. 6. Learn saturated heterocycles • Understand saturated five-membered heterocyclic compounds.
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69. Teaching and Learning Strategies

Strategy	* Delivering the scientific content gradually and systematically that considers students' prior knowledge, with emphasis on the fundamental concepts of organic chemistry relevant to pharmaceutical applications. * Developing students' analytical and critical thinking skills through discussion of reaction mechanisms, interpretation of results, and correlation between chemical structure, properties, and pharmacological activity. * Promoting active learning by engaging students in classroom discussions, problem solving, and analysis of real-world pharmaceutical examples. * Effectively utilizing the teaching laboratory to apply theoretical concepts in practice, with strong emphasis on laboratory safety rules and accuracy in experimental performance. * Employing **modern educational tools, such as presentations and visual models, to simplify molecular structures and organic reactions. * Encouraging self-directed and collaborative learning through homework assignments, preparation of laboratory reports, and short individual or group research projects.
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70. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-3	12	classes of heterocyclic systems; general	Heterocyclic system	Scientific Lectures	Scientific Examinations

		structures; properties; Occurrence in nature and in medicinal products.			
4-6	12	Five- membered ring heterocyclic compounds: pyrrole; furan and thiophen.	Five membered Ring heterocyclic compound	Scientific Lectures	Oral Examinations
7-8	8	Source of pyrrole, furan and thiophen.	Source of pyrrole, furan and thiophen.		Source of pyrrole, furan and t hiophen.
9-10	8	Electrophilic substitution in pyrrole, furan and thiophen: Reactivity and orientation.	pyrrole, furan and thiophen.		
11-12	8	Six- membered ring heterocyclic compounds: Structure & reactions of pyridine.	Six-membered ring heterocyclic ompounds		Six-membered ring heterocyclic compounds: Structure & reactions of pyridine.
13-14	8	Six- membered ring heterocyclic compounds: Structure & reactions of pyridine.		76	
15	4	Heterocyclic of five & six member rings with two & three heteroatoms.			
71. Course Evaluation					

Grade Distribution (out of 100) Based on Student Assignments and Assessments:

- **Midterm Exam:** 20 marks
- **Practical Exam (with detailed components):** 20 marks
- **Final Exam:** 60 marks

This distribution includes daily preparation, quizzes, oral and written assessments, laboratory reports, and other assigned tasks.

72. Learning and Teaching Resources

Required textbooks (curricular books, if any)	*Organic Chemistry by Robert T. Morrison and Robert N. Boyd.) *Organic Chemistry by McCurry; 5th ed. Thomson learning; CA,USA; 2000
Main references (sources)	Organic Chemistry by Janice Gorzynski Smith, 1st edition
Recommended books and references (scientific journals, reports...)	https://www.sciencedirect.com/book/9780128128381/organicchemistry
Electronic References, Websites	https://www.sciencedirect.com/book/9780128128381/organicchemistry

1. Course Name:						
Computer Science						
2. Course Code:						
221 ClCs						
3. Semester / Year:						
First /Second						
4. Description Preparation Date:						
2026/3/26						
5. Available Attendance Forms:						
In-person attendance						
6. Number of Credit Hours (Total) / Number of Units (Total):						
2/2						
7. Course administrator's name (mention all, if more than one name)						
1- Name: Name: Sally Mazen Saad Alshummari Email: sally.mazen@uoturath.edu.iq						
8. Course Objectives						
Course Objectives		1- Using Microsoft Excel to perform statistical analyses, data handling, and present data as graphs				
9. Teaching and Learning Strategies						
Strategy		1-Lectures and Presentation 2-Discussions 3- Inverted classrooms				
10. Course Structure						
Week	Hours	Required Outcomes	Learning Unit or subject name	Learning method	Evaluation method	
1	2	Data analysis using Microsoft Excel	Data analysis	- Lectures -Scientific YouTube videos -Laboratory	-Written exams - Oral exams -Laboratory reports	
				experiments		
2	2	Importing files with different formats into Excel	Importing files	=	=	

3	2	Calculate the statistical properties of variables	Descriptive statistics	=	=
4	2	Performing paired t-test in Excel to find the difference in the means of one sample in two occasions	One sample t- test	=	=
5	2	Performing unpaired t-test in Excel to find the difference in the means of two independent and related samples	Two Sample t-test	=	=
6	2	Performing analysis of variance test in Excel to find the difference in the means of multiple samples	ANOVA Test	=	=
7	Midterm examination				
8	2	Performing the correlation analysis of two variables using Excel	Correlation	=	=
9	2	Performing the regression analysis using	Regression	=	=

		Excel			
10,11	4	Illustrating ChemBio Office interface	Principle of ChemBio Office	=	=
12,13	4	Drawing two-dimensional chemical structures using ChemBio Office	2D Structure Draw	=	=
14,15	2	Drawing three-dimensional chemical structures using ChemBio Office	3D Structure Draw	=	=
11.Course Evaluation					
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily practical, monthly practical or written exams, and reports					
12.Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Microsoft office Professional 2019, BY Linda Foulkes, Senior Editor: Afshaan Khan ISBN 978-1-83921-725-8		
Main references (sources)					
Recommended books and references (scientific journals, reports...)			Microsoft office Professional 2010, BY Joyce Cox, Jo an Lambert & Curtis Frge		
Electronic References, Websites					

1. Course Name:					
Pharmacognosy II					
2. Course Code:					
Phpa2 331					
3. Semester / Year:					
1 st semester/ 3 rd year					
4. Description Preparation Date:					
12/2025					
5. Available Attendance Forms:					
attendance					
6. Number of Credit Hours (Total) / Number of Units (Total)					
4/3					
7. Course administrator's name (mention all, if more than one name)					
Name: Rasha A. Eldalawy Email: rasha.eldalawy@uoturath.edu.iq Name: Asmaa Mahdi Email: asmaa.mahdi@uoturath.edu.iq					
8. Course Objectives					
Course Objectives			To study the natural products and their metabolic pathways and Therapeutic uses		
9. Teaching and Learning Strategies					
Strategy		Lectures and presentation Discussion and analysis Research and readings			
10.Course Structure Pharmacognocyt II/ Theoretical/ 3rd stage /1st course					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2hr	Definition	Natural products and Biosynthetic pathways	Theoretical lectures	Oral examination And discussion
2	2hr	Definition and using	Lignans	Theoretical lectures	Oral examination and discussion
3	2hr	Definition and using	coumarins	Theoretical lectures	Oral examination And discussion
4	2hr	Definition and using	flavonoids	Theoretical lectures	Oral examination And discussion
5-6-7	2hr	Definition	glycosides	Theoretical lectures	Oral examination And discussion
8	2hr	Definition and using	Tannins	Theoretical lectures	Oral examination And discussion
9	2hr	Definition and using	lipids	Theoretical lectures	Oral examination And discussion
10	2hr	Definition and using	terpenoids	Theoretical lectures	Oral examination And discussion
11-12	2hr	Definition and classification	Volatile oils	Theoretical lectures	Oral examination And discussion
13	2hr	Definition and application	Plants containing volatile oils	Theoretical lectures	Oral examination And discussion
14	2hr	Definition and technique	Resins and resin combination	Theoretical lectures	Oral examination And discussion
15	2hr	Definition and technique	Non medicinal toxic plants	Theoretical lectures	Oral examination And discussion

Course structure of Pharmacognocny I/ Practical / 3 rd stage / 1 st course					
Week	Hrs.	Required learning outputs	Subject or Unit title	Teaching style	Estimation ways
1	2hr	Technique and use	Isolation of podophyllotoxin from Podophyllum plant by preparative TLC	practical	Oral and written exams, reports and discussion.
2	2hr	Technique and use	Review and general talk about glycosides	practical	Oral and written exams, reports and discussion.
3	2hr	Technique and use	Extraction of cardiac glycosides	practical	Oral and written exams, reports and discussion.
4	2hr	Technique and use	Identification of cardiac glycosides	practical	Oral and written exams, reports and discussion.
5	2hr	Technique and use	Extraction of Anthra-quinone glycosides	practical	Oral and written exams, reports and discussion.
6	2hr	Technique and use	Identification of anthra-quinone glycosides	practical	Oral and written exams, reports and discussion.
7	2hr	Technique and use	Extraction of saponine glycosides	practical	Oral and written exams, reports and discussion.
8	2hr	Technique and use	Identification of saponine glycosides	practical	Oral and written exams, reports and discussion.
9	2hr	Technique and use	Tannins extraction	practical	Oral and written exams, reports and discussion.
10	2hr	Technique and use	Identification of tannins	practical	Oral and written exams, reports and discussion.
11	2hr	Technique and use	Separation of volatile oils	practical	Oral and written exams, reports and discussion.
12	2hr	Technique and use	Identification of Volatile oil	practical 82	Oral and written exams, reports and discussion.
10. Course Evaluation					
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc					
11. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			1.Pharmacognosy and Pharmacobiotechnology by Tyler, 1996. (For theoretical) 2.Practical manual, college of pharmacy / Baghdad University. (For practical)		
Main references (sources)			Fundamentals of pharmacognosy and phytotherapy.		
Recommended books and references (scientific journals, reports...)			Research and reviews journal of Pharmacognosy and phytochemistry أساسيات علم العقاقير والعلاج النباتي		
Electronic References, Websites			Google scholar, research gate		

73. Course Name:		
Pharmaceutical Technology I		
74. Course Code:		
PPt1 332		
75. Semester / Year:		
1 st semester / 2025-2026		
76. Description Preparation Date:		
9 / 2025		
77. Available Attendance Forms:		
on campus		
78. Number of Credit Hours (Total) / Number of Units (Total):		
4 (3 h lectures + 2 h lab / week)		
79. Course administrator's name (mention all, if more than one name)		
Lectures	Assist. Prof. Dr. Entidhar Jasim Mohammed	entidhar.Jasim@uoturath.edu.iq
Lab	Lect. Dr. Mustafa Egla Kadim	mustafa.egla@uoturath.edu.iq
80. Course Objectives		
Course Objectives	1. Knowledge 1. Develop a solid understanding of pharmaceutical preformulation principles, including solubility, partition behavior, powder characteristics, and compaction properties. 2. Study the formulation, preparation, and appropriate administration of different solution dosage forms for both oral and topical use. 3. Examine the scientific principles and technical methods involved in designing pharmaceutical suspensions, with emphasis on stability, rheology, and compounding techniques. 4. Explore the formulation and delivery systems of aerosols and foams, particularly metered-dose inhalers and topical or vaginal preparations. 5. Acquire comprehensive knowledge of parenteral dosage forms, including injection types, sterilization processes, and manufacturing quality standards. 6. Build an understanding of proper storage, packaging, and labeling requirements for all included dosage forms to maintain product quality and ensure patient safety.	
	2. Skills 83 • Proper use of basic instruments and commonly used glassware in extemporaneous pharmaceutical preparation and compounding. • Practicing the professional role of the pharmacist in ensuring the provision of safe and effective medications for patients. • Developing skills in dispensing these dosage forms and accurately applying their practical procedures. • Utilizing acquired knowledge and skills to select appropriate therapeutic alternatives when needed. • Promoting the rational and efficient use of available resources.	
81. Teaching and Learning Strategies		
Strategy	1- Lecturing and Presentation 2- Discussions 3- Laboratory Experiments	

		4- Assignments			
82. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 – 3	3 hours per week for 3 weeks (theory), and 2 hours per week (practical)	• Introduction to pharmaceutical Technology, • The concept of preformulation • Solubility • Molecular dissociation • Partitioning • Dissolution rate • Hygroscopicity • Physical form • Powder properties • Compaction properties	Pharmaceutical preformulation	Presentation and Lecturing Laboratory Work Group Discussions	Oral Examination Comprehensive Written Examination Home Assignments Skills Assessment

4 - 6	3 hours per week for 3 weeks (theory), and 2 hours per week (practical)	• Some Solvents for Liquid Preparations • Preparation of solutions • Mixing oral liquids • Oral solutions and preparations for oral solution • Syrups • Elixirs • Tinctures • Proper administration and use of liquid peroral dosage forms • Topical Solutions and Tinctures • Vaginal and rectal solutions • Topical tinctures • Topical oral (dental) solutions • Miscellaneous solutions • Nonaqueous solutions • Extraction methods for preparin solutions	Solutions	Presentation and Lecturing Laboratory Work Group Discussions	Oral Examination Comprehensive Written Examination Home Assignments Skills Assessment
7		Mid -term exam			

8-10	3 hours per week for 3 weeks (theory), and 2 hours per week (practical).	• Reasons for suspension • Features of desired in a pharmaceutical suspension • Sedimentation rate of the particles of a suspension • Physical features of the dispersed phase • Dispersion medium • Rheology of suspensions • Preparation of suspensions • Sustained-release suspensions • Extemporaneous compounding of suspensions • Mixing solids in liquids • Packaging and storage of suspensions • Examples of pharmaceutical suspensions • Dry powders for oral suspension	Suspensions	Presentation and Lecturing Laboratory Work Group Discussions	Oral Examination Comprehensive Written Examination Home Assignments Skills Assessment
				86	
11 – 12	3 hours per week for 3 weeks (theory)	• Types of aerosols • Advantages of the aerosol dosage form • The aerosol principle • Aerosol systems • Aerosol container and valve assembly • Metered-dose inhalers • Filling operations		Aerosols and foams	Oral Examination Comprehensive Written

		• Packaging, labeling, and storage • Proper administration and Use of pharmaceutical aerosols • Examples of aerosols • Topical aerosols • Vaginal and rectal aerosols • Foams: Their types and preparation			Examination Home Assignments Skills Assessment
13 - 14	3 hours per week for 3 weeks (theory)	• Injections • Parenteral routes of administration • Official types of injections • Solvents and vehicles for injections • Colligative properties for injections • Methods of sterilization • Validation/ verification of sterility • The industrial preparation of parenteral products • Packaging, labeling, and storage of injections • Available injections (examples) • Small volume parenterals • Large volume parenterals • Special Considerations associated with parenteral therapy • Irrigation and dialysis solution	Parenterals	Flipped classroom model Pre-class assignment Lab work Group discussions	Oral Examination Comprehensive Written Examination Home Assignments Skills Assessment
14 – 15		Final exam			
83. Course Evaluation					
20% lab work , 15% mid-term exam, 5% Assignments and daily quizzes, 60% final exam					
84. Learning and Teaching Resources					

Required textbooks (curricular books, if any)	(Aulton's Pharmaceutics; The Design and Manufacture of Medicines; 6th edition, 2022) (Pharmaceutical Dosage Forms and Drug Delivery Systems by Howard A. Ansel; 11th edition, 2017)
Main references (sources)	(Pharmaceutical Dosage Forms and Drug Delivery Systems by Howard A. Ansel; 11th edition, 2017)
Recommended books and references (scientific journals, reports...)	1. Physiochemical Principles of Pharmacy Alexander T Florence, David Attwood 4th Edition 2. Martin AN, Sinko PJ and Singh Y, Martin's Physical Pharmacy and Pharmaceutical Sciences: Physical Chemical and Biopharmaceutical Principles in the Pharmaceutical Sciences. 6th Edition, Lippincott Williams & Wilkins ;2011
Electronic References, Websites	Drugs.com USPNF.com Google research

1. Educational Institution	AL- Turath University
2. Department / Center / College	College Of Pharmacy
3. Course Name / Code	Biochemistry I CIBi1 333
4. Available Modes of Attendance	Semester-based 88
5. Semester / Year	First Semester 2025-2026
6. Total Credit Hours	3hours Theory / 2 hours Practical
7. Date of Preparation of this Description	2025

8. Course Objectives

The objective of the biochemistry course in the first semester of the pharmacy program is to attempt to understand the chemistry of the living cell by utilizing the fundamentals of general chemistry for this purpose. Our academic curriculum aims to introduce the student, initially, to the biomolecules present in the body, such as carbohydrates, fats, and proteins, among others, which the body synthesizes or obtains from food. Students will study their chemical structure, scientific nomenclature, and understand their roles and functions within the body to prepare them for understanding cellular metabolism in the second semester.

➤ Teaching and Learning Methods

Utilizing a smart board to present the theoretical part and conduct practical experiments.

➤ Evaluation Methods

1. Short quizzes
2. Oral discussions
3. Midterm and final exams
4. Assessment of practical reports

Curriculum Structure					
Week	Time (hrs)	Topic Heading	Expected Learning Outcomes	Teaching Method	Evaluation Method
1 st	3	Familiarity with what biochemistry studies	Student's understanding of the course content, encouraging external reading, and providing a general overview of Biochemistry	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
2 nd	3	Amino acids: Structures of A.A Classification, properties, isomerism.	Familiarizing students to amino acids, their structures, and classifications	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
3 rd	3	Chemical reactions, zwitterion, isoelectric pH, non-proteogenic amino acids, and clinical importance,.	Familiarizing students with peptides, peptide linkages, and their physiological roles	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
4 th	3	Peptide bond, structure and function of some important peptides in human structure, quaternary structure.	Teaching students about Amino acids chemistry, structures, and functions in the body	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
5 th	3	Order of protein structure, bonds in proteins of different order of structure	Teaching students about Proteins chemistry, structures, and functions in the body	Using Smart Board and Conducting	Discussions and Evaluation of Practical Results/ Midterm Exam

				Scientific Experiments	
6 th	3	Determination of the amino acids sequence in primary order proteins,	Teaching students about amino acid sequencing in primary protein structure	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
7 th	3	Determination of the N and C termini.	Teaching students about amino acid ends	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
8 th	3	classification of CHO, Stereochemistry of monosaccharides.	Teaching students about carbohydrates, their chemical structure, and physiological functions	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
9 th	3	Lipids: Introduction, classification of lipids, fatty acids (F.A), nomenclature of F.A. Phospholipids	Providing an introduction to bio-lipids, their types, and physiological functions	Using Smart Board, Conducting Experiments, and Solving Mathematical Problems	Discussions and Evaluation of Practical Results
10 th	3	Enzymes structure, nomenclature, and classification	Explaining an overview of enzymes and their role in biological reactions	Using Smart Board, Conducting Experiments, and Solving Mathematical Problems	Discussions and Evaluation of Practical Results
11 th	3	Kinetics: General principles, factors effecting enzyme rates.	Teaching students about enzyme kinetics and its principles	Using Smart Board, Conducting Experiments, and Solving Mathematical Problems	Discussions and Evaluation of Practical Results
12 th	3	The competitive and noncompetitive inhibitors, irreversible inhibition	Understanding enzyme inhibition: types and examples	Using Smart Board, Conducting Experiments, and Solving Mathematical Problems	Discussions and Evaluation of Practical Results
13 th	3	The ideal enzyme-catalyzed step for regulation of a metabolic pathway,	Teaching students about enzyme regulation in metabolism	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results

14 th	3	The basic principles of endocrine hormone action	Introducing students to endocrine glands and their chemistry	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
15 th	3	The roles of stimulus, hormone release, signal generation, and response	Teaching students about the biological function of hormonal signals and stimuli	Using Smart Board and Conducting Scientific Experiments	Short exam
					Final Exam

Foundational Structure	
1- <i>Required textbooks</i>	• Harper's illustrated biochemistry • Authors: ▪ Rodwell VW ▪ Bender DA Botham KM Kennelly PJ ▪ Weil PA Edition Number: 31st Year of publication: 2018
2- <i>Primary references (sources)</i>	• Lippincott's Illustrated Reviews Biochemistry - Ferrier DR-6th edition
3- <i>Suggested references</i>	• Tietz Textbook of Clinical Chemistry and Molecular Diagnostics • Journal of Biological Chemistry JBC
4- <i>Websites, Online resources</i>	• Nader-Rifai Ph.D0 • Andrea-Horvath AR

1. Course Name:	
Pathophysiology	
2. Semester / Year	
First / Third	
3. Description Preparation Date:	
2025	
4. Available Attendance Forms:	
In-person attendance	
5. Number of Credit Hours (Total) / Number of Units (Total)	
5/4	
6. Course administrator's name (mention all, if more than one name)	
Name: Sura Akram Mohammed Email: sura.akram@uoturath.edu.iq Name: Halah Hussein Ali E.mail : halah.hussien@uoturath.edu.iq	
7. Course Objectives	
Course Objectives	To provide students with comprehensive theoretical and practical knowledge and to develop the technical skills necessary for the study and understanding of pathophysiology.
8. Teaching and Learning Strategies	
Strategy	- Lectures and structured presentations - Interactive discussions 92 - Brainstorming sessions - Research-based learning and inductive teaching

9. Course Structure

Week	Hours	Required Learning Outcomes	Unit	Learning method	Evaluation method
1	3	Introduction to pathophysiology and its relationship with related sciences, including immunology and histology, with an overview of key terminology used to describe pathological cellular changes. In the practical component, students will identify histopathological changes associated with cellular necrosis.	Introduction to pathophysiology	Lectures; Discussions and Reports	Exam and classroom activities
2	3	Disorders of electrolyte and water balance, including acid–base disturbances such as alkalosis and acidosis.	Electrolytes and water	=	=
3	3	Pathophysiology of cardiovascular system disorders. In the practical component, students will identify histopathological changes observed in selected cardiovascular diseases.	The circulatory system diseases	93 =	=

4	3	Pathophysiology of respiratory system diseases. In the practical component, students will identify histopathological changes observed in selected respiratory diseases.	The respiratory system diseases	=	=
5	3	Pathophysiology of urinary system diseases. In the practical component, students will identify histopathological changes observed in selected urinary diseases.	The urinary system diseases	=	=
6	3	Pathophysiology of digestive system diseases. In the practical component, students will identify histopathological changes observed in the gastrointestinal tract.	The digestive system diseases	=	=
7	Mid-tem examination				
8	3	Disorders of the liver, pancreas, gall bladder, and salivary glands In the practical part, identifying the histopathological lesions in some liver and pancreatic diseases	Diseases of organs and glands associated with the digestive system	94 =	=

9	3	Endocrine disorders and autoimmune diseases, including thyroid disorders, diabetes mellitus, and metabolic syndrome In the practical part, identifying the histopathological lesions in some endocrine glands	Autoimmune and glandular disorder	=	=
10	3	Pathophysiology of some neurological disorders In the practical part, identifying the histopathological lesions in neuroendocrine tissue	Disease of the nervous system	=	=
11	3	Pathophysiology of some male and female reproductive system diseases	Disease of the reproductive system	=	=
12	3	Pathophysiology of blood disease In the practical part, identifying the histopathological lesions in blood cells	Blood diseases	=	=
13	3	Pathophysiology of skin and musculoskeletal system diseases In the practical part, identifying histopathological lesions in muscles, ligaments, tendons, and bone	Disease of skin and musculoskeletal system	95 =	=

14	3	Theories and pathophysiology of cancer In the practical part, identifying histopathological lesions in selected tumor tissues	Cancerous diseases	=	=
15	3	Pathophysiology of cellular changes In the practical part, identifying histological changes in apoptosis, necrosis, hyperplasia, atrophy, and metaplasia	Cellular changes	=	=

10. Course Evaluation

- Mid-term examination 20 marks
- Practical work 20 marks
- Final examination 60 marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	• Study Guide for Understanding Pathophysiology 7th Ed; 2021 • Pathophysiology of Disease, An Introduction to Clinical Medicine, 6th Ed; 2010 96
Recommended books and references (scientific journals, reports...)	McCance & Huethers Pathophysiology ,9th Ed 2022
Electronic References, Websites	

1.Course Name:					
Pharmacology I					
2.Course code					
PtPc1 337					
3. Semester / Year:					
Semester 2/2024-2025					
4. Description Preparation Date:					
2025					
5. Available Attendance Forms:					
on campus					
6. Number of Credit Hours (Total) / Number of Units (Total)					
45 hr.					
7. Course administrator's name (mention all, if more than one name)					
Name: : Sura Akram Mohammed Email: sura.akram@uoturath.edu.iq					
8. Course Objectives					
Course Objectives		This course is designed to provide pharmacy students with a comprehensive understanding of general pharmacokinetics, drug–receptor interactions, and pharmacodynamics. The course includes an overview of the autonomic nervous system, with detailed study of the cholinergic and adrenergic systems and their related pharmacological agents. In addition, the course introduces students to antimicrobial pharmacology, focusing on the classification, mechanisms of action, therapeutic indications, and adverse effects of drugs used in the treatment of infectious diseases. The curriculum also covers antimycobacterial, antifungal, antiprotozoal, and anthelmintic drugs, with emphasis on their clinical applications and rational use.			
9. Teaching and Learning Strategies					
Strategy		The course employs a variety of teaching approaches, including traditional lectures, collaborative group learning, self-directed individual study, and interactive participatory activities supported by the use of point-solution apparatus.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	To introduce pharmacy students to the general principles of pharmacokinetics.	Pharmacokinetics	Teaching methods include lecture-based instruction, group learning, individual learning, and interactive/participative methods through the use	Assessment methods include examinations and quizzes conducted through the use of point-solution

				of point-solution apparatus.	apparatus, written reports, and practical experience assessments.
2	3	To introduce pharmacy students to drug–receptor interactions and the principles of pharmacodynamics.	Drug–receptor interactions and pharmacodynamics c	Teaching methods include lecture-based instruction, group learning, individual learning, and interactive/participative methods through the use of point-solution apparatus.	Assessment methods include examinations and quizzes conducted through the use of point-solution apparatus, written reports, and evaluation of practical experiences.
2	6	To introduce pharmacy students to the autonomic nervous system (ANS), including the cholinergic and adrenergic systems.	Autonomic nervous system (ANS), cholinergic system, and adrenergic system.	Teaching methods include lecture-based instruction, group learning, individual learning, and interactive/participative methods through the use of point-solution apparatus.	Assessment methods include examinations and quizzes conducted through the use of point-solution apparatus, written reports, and evaluation of practical experience
1	3	To introduce pharmacy students to the principles of antimicrobial therapy.	Principal of antimicrobial therapy.	Teaching methods include lecture-based instruction, group learning, individual learning, and interactive/participative methods through the use of point-solution apparatus	Assessment methods include examinations and quizzes conducted through the use of point-solution apparatus, written reports, and evaluation of practical experiences
2	6	To introduce pharmacy students to β -lactam antibiotics and other cell wall synthesis inhibitor agent	β - lactam and other cell wall synthesis inhibitor antibiotics	The teaching methods include lecture-based instruction, group learning, individual learning, and interactive/participatory teaching methods	Student assessment will include examinations and quizzes conducted through the use of

				through the use of point-solution apparatus.	point-solution apparatus , as well as written reports based on practical experiences
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1. Course Name:	
Pharmaceutical and Cosmetic Preparations	
2. Course Code:	
Ppt2 338	
3. Semester / Year:	
2 nd semester / 2025 – 2026	
4. Description Preparation Date:	
12 / 2025	
5. Available Attendance Forms:	
on campus	
6. Number of Credit Hours (Total) / Number of Units (Total):	
3 hours per week (theory), 2 hours per week (practical), total units = 4	
7. Course administrator's name (mention all, if more than one name)	
Name: Assist. Prof. Dr. Entidhar Jasim Mohammed Email: entidhar.Jasim@uoturath.edu.iq Lab instructors: Lect. Dr: Mostafa Aukla Kadim Email: mustafa.egla@uoturath.edu.iq	
8. Course Objectives	
Course Objectives	2. Knowledge - Gain a comprehensive understanding of the principles, preparation methods, and stability considerations of pharmaceutical emulsions, including surfactant systems and microemulsions. - Examine the formulation, compounding, and therapeutic applications of semisolid dosage forms such as ointments, creams, gels, and other dermatologic preparations. - Investigate the design, manufacturing processes, and clinical uses of suppositories, vaginal inserts, and medication sticks, with emphasis on quality control practices. - Understand the physicochemical and therapeutic factors involved in selecting suitable bases and packaging materials for topical and rectal formulations. - Review formulation approaches and clinical applications of cosmetic products, including sunscreens, exfoliants, and anti-aging preparations. - Apply formulation science principles to optimize the safety, efficacy, and patient acceptability of pharmaceutical and cosmetic products. 3. Skills 100 - Developing skills in dispensing these dosage forms and correctly applying their procedures. - Utilizing acquired knowledge and skills to select appropriate therapeutic alternatives when needed. - Promoting the optimal and rational use of available resource
9. Teaching and Learning Strategies	
Strategy	- Lecturing and Presentation - Discussions - Laboratory Experiments

		4. Assignments			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 – 3	3 hours per week for 3 weeks (theory), and 2 hours per week (practical	• Purpose of emulsion and emulsification • Theories of emulsification • Gibbs free energy in an emulsion • Preparation of emulsions • Emulsifying agents • HLB system • Blending of surfactants • Surface area of globules • Methods of emulsion preparation • Mixing immiscible liquids • Microemulsions • Stability of emulsions • Examples of oral emulsions • Examples of topical emulsions	Emulsion	Presentation and Lecturing Laboratory Work Group Discussions	Oral Examination Comprehensive Written Examination Home Assignments Skills Assessment
4 – 6	3 hours per week for 3 weeks (theory), and 2 hours per week (practical)	• Ointments • Ointment bases • Selection of the appropriate base • Compendial requirements for ointments • Preparation of ointments • Creams • Preparation of creams • Gels: preparation, packaging and storage • Miscellaneous semisolid preparations: pastes, plasters, and glycerogelatins • Packaging semisolid preparations • Examples of ointments, creams and gels • Features and uses of dermatologic preparations • Features and uses of ophthalmic ointments and gels • Features and uses of nasal ointments and gels • Features and uses of rectal preparations • Features and uses of vaginal preparations • Drug release from semisolid	Ointments creams and gels	Presentation and Lecturing Laboratory Work Group Discussions 101	Oral Examination Comprehensive Written Examination Home Assignments Skills Assessment

		dosage forms			
7 – 8		Mid- term exam			
9 – 10	3 hours per week for 2 weeks (theory), and 2 hours per week (practical)	• Suppositories • Uses and applications • Some factors of drug absorption from rectal suppositories • Suppository bases • Formulation variables • Preparation of suppositories (dose replacement calculations) • Manufacturing suppositories • Quality control • Packaging and storage • Stability • Rectal suppositories (with examples) • Urethral suppositories (with examples) • Vaginal inserts • Vaginal inserts (tablets) • Medication sticks • Special types of suppositories • Clinical considerations	Suppositories, inserts and sticks	Presentation and Lecturing Laboratory Work Group Discussions	Oral Examination Comprehensive Written Examination Home Assignments Skills Assessment
11	3 hours per week for (theory) and 2 hours per week (practical)	• Physical incompatibilities • chemical incompatibilities • correction of incompatibilities	Pharmaceutical Incompatibilities	Presentation and Lecturing Laboratory Work Group Discussions	Oral Examination Comprehensive Written Examination Home Assignments Skills Assessment
12-14	3 hours per week for 3 weeks (theory), and 2 hours per week (practical)	• Introduction • Cosmetic formulation of skin care products • Toners and astringents • Antiperspirants • Sunscreens • Anti-aging skin care formulations • Topical exfoliation—clinical effects and formulating considerations • Herbs in cosmeceuticals	Cosmetic Formulations	Presentation and Lecturing Laboratory Work Group Discussions	Oral Examination Comprehensive Written Examination Home Assignments Skills Assessment
14-15		Final exam			
11. Course Evaluation					
20% lab, 15% mid-term exam, 5% Assignments and daily quizzes, 60% final exam					

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Pharmaceutical Dosage Forms and Drug Delivery Systems by Howard A. Ansel; 11th edition, 2017 Cosmetic Formulation of Skin Care Products; by Zoe Diana Draelos and Lauren A. Thaman; Taylor and Francis Group; 2006
Main references (sources)	Pharmaceutical Dosage Forms and Drug Delivery Systems by Howard A. Ansel; 11th edition, 2017
Recommended books and references (scientific journals, reports...)	Physiochemical Principles of Pharmacy Alexander T Florence, David Attwood 4th Edition Chapter 10 (2006) 5th Edition Chapter 11(2011)
Electronic References, Websites	Drugs.com USPNF.com Google research

1. Educational Institution	AL- Turath University
2. Department / Center / College	College Of Pharmacy
3. Course Name / Code	Biochemistry II CIBi2 339
4. Available Modes of Attendance	Semester-based
5. Semester / Year	Second Semester 2025-2026
6. Total Credit Hours	3hours Theory / 2 hours Practical
7. Date of Preparation of this Description	2025
8. Course Objectives - Understanding metabolism: Understand how the body releases energy from biomolecules such as carbohydrates, fats, and proteins. - Principles of biochemistry: Provide a strong foundation for a successful career in biochemistry. - Developing essential skills: Equip students with fundamental skills necessary for future studies, such as data analysis and presentation. - Advanced biochemistry topics: Prepare students to discuss current topics in biochemistry.	

➤ **Teaching and Learning Methods**

1. Utilizing cooperative and supportive strategies during the teaching process.
2. Conducting field visits to related educational institutions.
3. Organizing seminars, courses, and workshops for students that promote spiritual values.
4. Forming discussion groups during lectures.
5. Assigning students tasks that require subjective explanations using causal reasoning.

Curriculum Structure 104					
Week	Time (hrs)	Topic Heading	Expected Learning Outcomes	Teaching Method	Evaluation Method
1 st	3	Bioenergetics	Introduce students to bioenergetics and how energy is released through biological oxidation.	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
2 nd	3	Biological Oxidation and Respiratory Chain	each students about cellular respiration and its importance.	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results

3 rd	3	Over view of metabolism	Familiarizing students to cellular metabolism and its pathways.	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
4 th	3	Citric Acid Cycle	Explain the Krebs cycle and its role in the body.	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
5 th	3	Glycolysis	Describe the glycolytic pathway and glucose metabolism.	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results/ Midterm Exam
6 th	3	Metabolism of Glycogen	Explain glycogen metabolism and its importance.	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
7 th	3	Gluconeogenesis	Describe the process of gluconeogenesis and glucose synthesis.	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
8 th	3	Pentose Phosphate Pathway	Explain the pentose phosphate pathway and its significance.	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
9 th	3	Biosynthesis of fatty acids	Teach students about fatty acid synthesis and its regulation.	Using Smart Board, Conducting Experiments, and Solving Mathematical Problems	Discussions and Evaluation of Practical Results
10 th	3	Oxidation of fatty acids	Explain fatty acid oxidation and its importance.	Using Smart Board, Conducting Experiments, and Solving Mathematical Problems	Discussions and Evaluation of Practical Results
11 th	3	Lipid transport and storage/ Cholesterol synthesis	Describe how lipids are transported and stored in the body. Explain cholesterol synthesis and its regulation.	Using Smart Board, Conducting Experiments, and Solving Mathematical Problems	Discussions and Evaluation of Practical Results

12 th	3	Metabolism of acyl glycerol	Understanding the metabolic pathways and fate of glycerol structures	Using Smart Board, Conducting Experiments, and Solving Mathematical Problems	Discussions and Evaluation of Practical Results
13 th	3	Biosynthesis of amino acids	each students about amino acid synthesis and its importance.	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
14 th	3	Catabolism of proteins	Describe protein degradation and its significance.	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
15 th	3	Conversion of amino acids to specialized products	Explain how amino acids are converted to specialized compounds.	Using Smart Board and Conducting Scientific Experiments	Short exam
					Final Exam

Foundational Structure	
4- Required textbooks	• Harper's illustrated biochemistry • Authors: ▪ Rodwell VW ▪ Bender DA Botham KM Kennelly PJ ▪ Weil PA Edition Number: 31st Year of publication: 2018
5- Primary references (sources)	• Lippincott's Illustrated Reviews Biochemistry - Ferrier DR- 6th edition
6- Suggested references	• Tietz Textbook of Clinical Chemistry and Molecular Diagnostics • Journal of Biological Chemistry JBC
4- Websites, Online resources	• Nader-Rifai Ph.D0 • Andrea-Horvath AR

1. Course Name:					
Pharmacognosy III					
2. Course Code:					
phPa3 340					
3. Semester / Year:					
2 nd semester/ 3 rd year					
4. Description Preparation Date:					
12/2025					
5. Available Attendance Forms:					
attendance					
6. Number of Credit Hours (Total) / Number of Units (Total)					
4/3					
7. Course administrator's name (mention all, if more than one name)					
Name: Rasha A. Eldalawy Email: rasha.eldalawy@uoturath.edu.iq					
Name: Asmaa Mahdi Email: asmaa.mahdi@uoturath.edu.iq					
8. Course Objectives					
Course Objectives		To study alkaloids and its classification, antibiotics biosynthetic Pathways, phytotherapy			
9. Teaching and Learning Strategies					
Strategy		Lectures and presentation Discussion and analysis Research and readings			
10. Course Structure Pharmacognocny II/ Theoretical/ 3 rd stage /1 st course					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-9	2hr	Definition	Alkaloids and its classification	Theoretical lectures	Oral examination And discussion
10-12	2hr	Definition and using	Antibiotics	Theoretical lectures	Oral examination and discussion
13-15	2hr	Definition and using	Phytotherapy	Theoretical lectures	Oral examination And discussion
Course structure of Pharmacognocny I/ Practical / 3 rd stage / 2 nd course					
Week	Hrs.	Required learning outputs	Subject or Unit title	Teaching style	Estimation ways
1	2hr	Technique and use	Introduction of alkaloids	practical	Oral and written exams, reports and discussion.
2	2hr	Technique and use	Extraction of Piperine from Black Pepper	practical	Oral and written exams, reports and discussion.
3	2hr	Technique and use	Identification of Piperine from Black Pepper	practical	Oral and written exams, reports and discussion.
4	2hr	Technique and use	Extraction of Belladonna alkaloids	practical	Oral and written exams, reports and discussion.
5	2hr	Technique and use	Identification of Belladonna alkaloids	practical	Oral and written exams, reports and discussion.

6	2hr	Technique and use	Extraction of Caffeine From Tea	practical	Oral and written exams, reports and discussion.
7	2hr	Technique and use	Identification of Caffeine Crystals	practical	Oral and written exams, reports and discussion.
8	2hr	Technique and use	Extraction of harmful alkaloids	practical	Oral and written exams, reports and discussion.
9	2hr	Technique and use	Identification of harmful alkaloids	practical	Oral and written exams, reports and discussion.
10. Course Evaluation					
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc					
11. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			1. Pharmacognosy and Pharmacobiotechnology by Tyler, 1996. (For theoretical) 2. Practical manual, college of pharmacy / Baghdad University. (For practical)		
Main references (sources)			Fundamentals of pharmacognosy and phytotherapy.		
Recommended books and references (scientific journals, reports...)			Research and reviews journal of Pharmacognosy and phytochemistry أساسيات علم العقاقير والعلاج النباتي		
Electronic References, Websites			Google scholar, research gate		

1.Course Name:	
Pharmacy Ethics	
2.Course code	
TU 344	
3. Semester / Year:	
Semester 2/Third	
4. Description Preparation Date:	
2025	
5. Available Attendance Forms:	
on campus	
6. Number of Credit Hours (Total) / Number of Units (Total)	
1 Hour /1 Units	
7. Course administrator's name (mention all, if more than one name)	
Name:	
Email:	
8. Course Objectives	
Course Objectives	This course provides an overview of the ethical issues encountered by practicing pharmacists. It aims to enable students to understand the fundamental principles of professional ethics that govern the relationship between pharmacists and patients, colleagues, and other healthcare professionals. Emphasis is placed on applying ethical concepts to ensure the responsible, professional, and effective delivery of pharmaceutical services

9. Teaching and Learning Strategies					
Strategy		This course enables students to understand ethical issues and common ethical dilemmas that may be encountered by pharmacists in community pharmacies, hospitals, and other professional practice settings.			
10. Course Structure			109		
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	History and Definition of Ethics in Pharmacy	Introduction to Pharmacy Ethics (Theoretical Considerations)	Power point lecture	Quiz
2	1	Principles of the Code of Pharmacy Ethics	Code of Ethics for Pharmacists	Power point lecture	Quiz
3	2	Definitions and Examples of Ethical Considerations	Common Ethical Considerations in Pharmaceutical Care	Power point lecture	Quiz

			Practice (Beneficence, Autonomy, Honesty, Informed Consent, Confidentiality, Fidelity, etc.)		
4	1	Definitions and examples about ethical considerations	Other ethical considerations	Power point lecture	Quiz
5	2	How to Build Effective Interprofessional Collaboration and Consideration	Interprofessional Relations	Power point lecture	Quiz
6	1	Types of ethical decisions	Making ethical decisions.	Power point lecture	Quiz
7	1	Understanding the Role of Ethics in Research	Ethical Issues Related to Clinical Pharmacy Research	Power point lecture	Quiz
8	1	Misuse and Abuse: Definition, Prevention, Treatment, and Complications	Preventing misuse of medicines.	Power point lecture	Quiz
9	3	1. Application of Ethical Considerations in Clinical Cases 2. Main Ethical Dilemmas in Clinical Cases	Case Studies in Pharmacy Ethics	Power point lecture	Quiz
11. Course Evaluation					
Theoretical midterm exam (25%), Quizzes (2%) , and attendance (3%), and the end semester exam will be assessed for 70% of the final mark					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Robert J. Cipolle, Linda M. Strand, Peter C. Morley. Pharmaceutical Care Practice: The Clinician's Guide.		
Main references (sources)					
Recommended books and references (scientific journals, reports...)			1- Course notes in medical ethics and law 2- Compelling_Ethical_Challenges_in_Critical_Care_and_Emergency_Medicine		
Electronic References, Websites			Review articles		

1. Course Name:					
Inorganic pharmaceutical chemistry					
2. Course Code:					
PcIc330					
3. Semester / Year:					
Semester 1/ 3rd stage (2025-2026)					
4. Description Preparation Date:					
2026 /3					
5. Available Attendance Forms:					
Manual (paper-based forms)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
30 hours / 3 units					
7. Course administrator's name (mention all, if more than one name)					
Name: lecturer Dr. Hasanain Amer Naji Email: hasanain.naji@uoturath.edu.iq Lab. Name: Assist. Lecturer Hayjaa Muhessen Mousa Email : hayjaa.muhsen@uoturath.edu.iq					
8. Course Objectives					
Course Objectives		1.Studying elements, ions, and inorganic compounds, and explaining their pharmaceutical importance, therapeutic effects, and toxicity. 2. Explaining the biological effects of Essential elements in the body and\ the therapeutic effects of non-essential elements. 3.Highlighting radioactive elements and their therapeutic and diagnostic roles in medical conditions. 4. Studying Ions that affect the GIT and explaining their therapeutic applications. 5. Studying the toxicity of inorganic elements and compounds and how to treat it			
9. Teaching and Learning Strategies					
Strategy	1- Theoretical lectures 2- Conducting scientific experiments 3- Textbooks and supporting materials 4- Scientific discussions 5- Explanatory videos 6-Reports				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Knowing the electronic configuration of alkali metals, the biological importance and their therapeutic application	Alkali metals	lectures	Written tests and surprise discussions
2	2	Knowing the electronic configuration of alkaline earth metals, the biological importance and their therapeutic	Alkaline earth metals	lectures	Written tests and surprise discussions

		application			
3-4	4	Knowing the electronic configuration of group 13, And their therapeutic Application	Group 13	lectures	Written tests and surprise discussions
5	2	Knowing the electronic configuration of group 14, And their therapeutic Application	The Carbon Group	lectures	Written tests and surprise discussions
6-7	4	Knowing the electronic configuration of transition metals , And their therapeutic Application	Transition metals and d-block metal chemistry	lectures	Written tests and surprise discussions
8	2	Knowing how the chelating agent work	Chelation therapy	lectures	Written tests and surprise discussions
9	2	Studying some examples of protective adsorbents and their therapeutic action	Protective adsorbents	lectures	Written tests and surprise discussions
10	2	Studying some examples of dental agents and their clinical application	Dental agents	lectures	Written tests and surprise discussions
11	2	Studying important Topical agents and what is the difference between cream and ointment application	Topical agents	lectures 112	Written tests and surprise discussions
12	2	Knowing the importance of organometallic chemistry , And their clinical Application	Organometallic chemistry	lectures	Written tests and surprise discussions
13-14	4	Knowing the important radio active compounds and their clinical application	Radioactive Compounds and Their Clinical Application	lectures	Written tests and surprise discussions

15	2	Knowing the important radio active compounds and their use in diagnosis	Radio Pharmaceuticals for imaging	lectures	Written tests and surprise discussions
11. Course Evaluation					
1- Practical exam: 20 marks					
2- Theoretical exam: 20 marks					
3- Semester total degree : 40 marks					
4- Final exam: 60 marks					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Essentials of Inorganic Chemistry For Students of Pharmacy, Pharmaceutical Sciences and Medicinal Chemistry by KATJA A. STROHFELDT, School of Pharmacy, University of Reading, UK		
Main references (sources)			Inorganic Medicinal and Pharmaceutical Chemistry by Block, Roche Soine and Wilson, latest edition		
Recommended books and references (scientific journals, reports...)			Foye's Principles of Medicinal Chemistry by David A. Williams and Thomas L.Lemke		
Electronic References, Websites			Google searching for the latest references		
1. Course Name:					
Organic pharmaceutical chemistry I					
2. Course Code:					
PcOp1 336					
3. Semester / Year:					
Semester 2/ 3 rd stage (2025-2026)					
4. Description Preparation Date:					
2026 /3					
5. Available Attendance Forms:					
Manual (paper-based forms)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
45 hours / 4 units					
7. Course administrator's name (mention all, if more than one name)					
Name: lecturer Dr. Hasanain Amer Naji					
Email: hasanain.naji@uoturath.edu.iq					
Lab.					
Name: Assist. Lecturer Hayjaa Muhessen Mousa					
Email : hayjaa.muhsen@uoturath.edu.iq					
8. Course Objectives					
Course Objectives			1. Understanding the drug's journey within the body (absorption, metabolism, distribution) and excretion.		
			2. Understanding how drugs bind to receptors and the types of bonds used.		
			3.Understanding how pharmaceutical compounds are manufactured using modern methods.		
			4. Studying the different metabolic reactions of pharmaceutical compounds.		
			5. Studying the factors that affecting metabolism within the body		
9. Teaching and Learning Strategies					
Strategy		1- Theoretical lectures			

2- Conducting scientific experiments 3- Textbooks and supporting materials 4- Scientific discussions 5- Explanatory videos 6-Reports					
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Knowing how drug distribute throughout the body	Drug distribution	lectures	Written tests and surprise discussions
2	3	Studying the Pka of drug And how it affected by the pH of the gastric and intestine	Acid base properties include percent ionization	lectures	Written tests and surprise discussions
3	3	Knowing how drug molecule manufactured by using early and newer methods	QSAR models	lectures	Written tests and surprise discussions
4	3	Studying the bonds and how drug interacts with receptor	Drug receptor interaction: forces involved	lectures	Written tests and surprise discussions
5	3	Knowing how steric features affect drug to bind to the receptors	Steric features of drugs	lectures	Written tests and surprise discussions
6	3	Studying the change in one atom how it affects biological activity	Isosterism, optical isomerism and biological activity	lectures	Written tests and surprise discussions
7-8	6	Knowing the sites of drug metabolism and the role of CYP 450	General pathways of drug metabolism	lectures	Written tests and surprise discussions
9-10	6	Studying the reactions of different functional groups	Oxidation reactions	lectures	Written tests and surprise discussions
11-12	6	Studying the reactions involving carbon heteroatom system	Oxidation reactions	lectures	Written tests and surprise discussions

13	3	Studying the reactions of different functional groups	Reduction and hydrolysis reactions	lectures	Written tests and surprise discussions
14	3	Studying the different reactions it happened in This phase	Phase II metabolism reactions	lectures	Written tests and surprise discussions
15	3	Studying all the factors it may affect drug metabolism	Factors affecting drug metabolism	lectures	Written tests and surprise discussions
11. Course Evaluation					
1- Practical exam: 20 marks 2- Theoretical exam: 20 marks 3- Semester total degree : 40 marks 4- Final exam: 60 marks					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Wilson and Gisvolds textbook of organic medicinal and pharmaceutical chemistry, John M. B.; John H.B. (twelfth edition)		
Main references (sources)			An Introduction to Medicinal Chemistry 5th Edition by Graham L. Patrick, University of the West of Scotland, UK		
Recommended books and references (scientific journals, reports...)			Foye's Principles of Medicinal Chemistry by David A. Williams and Thomas L.Lemke		
Electronic References, Websites			https://www.sciencedirect.com/book/9780128128381/organic-chemistry		

1. Course Name:					
Industrial Pharmacy II					
2. Course Code:					
Pip1454					
3. Semester / Year:					
First semester/ fifth year					
4. Description Preparation Date:					
12/2025					
5. Available Attendance Forms:					
Attendance					
6. Number of Credit Hours (Total) / Number of Units (Total)					
4 Credits (3Theory + 1 Practical)					
7. Course administrator's name (mention all, if more than one name)					
Name: Sanarya Thamer Naser , afaq mahdi ali , mustafa ugla kahdum Email: sanaria.thamer@uoturath.edu.iq , afaq.mahdi@uoturath.edu.iq , mustafa.egla@uoturath.edu.iq .					
8. Course Objectives					
Course Objectives			-To introduce students to the fundamental principles of industrial pharmacy and unit operations. -To understand size reduction, mixing, drying, filtration, and sterilization processes. -To familiarize students with Good Manufacturing Practices (GMP) and quality control concepts. -To integrate theoretical knowledge with practical pharmaceutical manufacturing applications.		
9. Teaching and Learning Strategies					
Strategy		Interactive lectures, laboratory training, scientific discussions, and problem-based learning.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Explain the role of solid dosage forms in therapy and describe their advantages, limitations, formulation principles, and quality requirements.	Tablets: Role in Therapy, Formulation and Evaluation	Interactive lecture, discussion	Written exam, oral questions
2	3	Describe granulation processes and methods of tablet production, including excipients and types of tablets.	Tablet Manufacturing: Granulation and Production Methods	Lecture, problem-based learning	Written exam
3	3	Explain principles, materials, equipment, and processing steps involved in tablet coating and identify common coating problems.	Tablet Coating: Sugar and Film Coating	Lecture, case discussion	Written exam, assignment
4	3	Describe hard gelatin capsule materials, production methods,	Hard Gelatin Capsules	Lecture, discussion	Written exam

		filling equipment, formulation, and special techniques.			
5	3	Explain manufacturing methods, processing, control, and stability considerations of soft gelatin capsules.	Soft Gelatin Capsules	Lecture, discussion	Written exam
6	3	Describe micro-encapsulation principles, materials, stability aspects, and industrial methodologies.	Micro-encapsulation Techniques	Lecture, discussion	Written exam
7	3	Explain theory, formulation, evaluation, and testing of modified and sustained-release dosage forms.	Modified (Sustained) Release Dosage Forms	Lecture, problem solving	Written exam, quiz
8	3	Describe formulation principles, stability issues, and equipment used in liquid dosage forms.	Liquid Dosage Forms	Lecture, discussion	Written exam
9	3	Explain formulation, evaluation, and quality control of pharmaceutical suspensions.	Suspensions	Lecture, case discussion	Written exam
10	3	Describe theory, formulation, equipment, and quality control of pharmaceutical emulsions.	Emulsions	Lecture, discussion	Written exam
11	3	Explain formulation, bases, preservation, processing, and evaluation of semisolid dosage forms.	Semisolid Dosage Forms	Lecture, discussion	Written exam
12	3	Describe formulation, components, stability, manufacturing, and quality control of pharmaceutical aerosols.	Pharmaceutical Aerosols	Lecture, discussion	Written exam, assignment
11. Course Evaluation					
Written examinations, Oral examinations, Laboratory reports, Practical performance, Attendance and participation all these details cover 100 marks					
12. Learning and Teaching Resources					

Required textbooks (curricular books, if any)	• Lachman L., Lieberman H.A., Kanig J.L. <i>The Theory and Practice of Industrial Pharmacy</i>, Latest Edition.
Main references (sources)	• Aulton's <i>Pharmaceutics: The Design and Manufacture of Medicines</i>, 6th Edition. • Journal of Pharmaceutical Sciences • International Journal of Pharmaceutics
Recommended books and references (scientific journals, reports...)	• Pharmaceutical Dosage Forms and Drug Delivery Systems – Ansel
Electronic References, Websites	• Google Scholar • PubMed • FDA and EMA pharmaceutical guidelines

1. Course Name:					
Applied Therapeutics I					
2. Course Code:					
CpAt1559					
3. Semester / Year:					
First semester/ Fifth					
4. Description Preparation Date:					
2025					
5. Available Attendance Forms:					
On campus					
6. Number of Credit Hours (Total) / Number of Units (Total)					
3 Hours /3 Units					
7. Course administrator's name (mention all, if/ more than one name)					
Name: Dr. Zainab Taha Mohammed Jaddoa Email: zainab.taha@uoturath.edu.iq					
8. Course Objectives					
Course Objectives			- The course provides students with the basic knowledge about pathophysiology, symptoms and aims of treatment. - In addition to the basic knowledge on the drug's use, kinetics, drug interactions, dose calculations, side effects, treatment algorithms and patient awareness are provided.		
9. Teaching and Learning Strategies					
Strategy		Lectures Seminars Simple quizzes Brainstorming questions			
119					
10. Course Structure					
Week	Hour s	Required Learning Outcomes	Unit or subject name	Learning method	Evaluatio n method
1	2	1. Differentiate between Sensitivity and Specificity of lab tests. 2. Identify reference ranges of lab tests.	Interpretation of clinical laboratory data	Lectures. Discussions.	Simple quizzes.

13. Course Name:					
Clinical Chemistry					
14. Course Code:					
CICc560					
15. Semester / Year:					
FIRST Semester 2025-2026					
16. Description Preparation Date:					
2025					
17. Available Attendance Forms:					
Semester-based					
18. Number of Credit Hours (Total) / Number of Units (Total)					
3hours Theory / 2 hours Practical					
19. Course administrator's name (mention all, if more than one name)					
Name: Lecturer Abbas Mosad Ajeed Email: abbas.musaad@uoturath.edu.iq					
20. Course Objectives					
Course Objectives			4. Empowering students with a solid understanding of clinical chemistry fundamentals. 5. Enabling them to link biochemical and metabolic abnormalities to disease development. This includes learning about biological sample collection, measurement, and interpretation of results, which are essential for diagnosing and managing diseases like diabetes, liver disorders, and kidney diseases.		
21. Teaching and Learning Strategies					
Strategy		1. Utilizing cooperative and supportive strategies during the teaching process. 2. Conducting field visits to related educational institutions. 3. Organizing seminars, courses, and workshops for students that promote spiritual values. 4. Forming discussion groups during lectures. 5. Assigning students tasks that require subjective explanations using causal reasoning.			
22. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 st	3	Introduce students to bioenergetics and how energy is released through biological oxidation.	Disorders of Carbohydrates metabolism, Hyperglycemia & Diabetes mellitus, Hypoglycemia	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
2 nd	3	Each students about cellular respiration and its importance.	Disorders of lipid metabolism	Using Smart Board and Conducting	Discussions and Evaluation

				Scientific Experiments	of Practical Results
3 rd	3	Familiarizing students to cellular metabolism and its pathways.	Liver Function Tests	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
4 th	3	Explain the Krebs cycle and its role in the body.	Kidney Function Tests	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
5 th	3	Describe the glycolytic pathway and glucose metabolism.	Diagnostic enzymology	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results/ Midterm Exam
6 th	3	Explain glycogen metabolism and its importance.	Hypothalamus & pituitary endocrinology, adrenal gland	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
7 th	3	Describe the process of gluconeogenesis and glucose synthesis.	Reproductive system, disorders of gonadal function in males & females	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
8 th	3	Explain the pentose phosphate pathway and its significance.	Thyroid function tests	Using Smart Board and Conducting Scientific Experiments	Discussions and Evaluation of Practical Results
9 th	3	Teach students about fatty acid synthesis and its regulation.	Drug interaction with laboratory Tests	Using Smart Board, Conducting Experiments, and Solving Mathematical Problems	Discussions and Evaluation of Practical Results
10 th	3	Explain fatty acid oxidation and its importance.	Disorders of calcium metabolism	Using Smart Board, Conducting Experiments, and Solving Mathematical Problems	Discussions and Evaluation of Practical Results
11 th	3	Describe how lipids are transported and stored in the body. Explain	Tumor markers	Using Smart Board, Conducting	Discussions and Evaluation

		cholesterol synthesis and its regulation.		Experiments, and Solving Mathematical Problems	of Practical Results
12 th	3	Understanding the metabolic pathways and fate of glycerol structures	Inborn errors of metabolism	Using Smart Board, Conducting Experiments, and Solving Mathematical Problems	Discussions and Evaluation of Practical Results
23. Course Evaluation					
Discussions within small groups					
24. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Crook, Clinical Chemistry & Metabolic Medicine, 8th edition		
Main references (sources)			1. Tietz Clinical chemistry & Molecular Diagnostics 6th edition; 2018 2. Kaplan, Clinical Chemistry, 5th edition		
Recommended books and references (scientific journals, reports...)			1- Lecture notes Textbook of Clinical Chemistry and Molecular Diagnostics 2- Journal of Biological Chemistry JBC		
Electronic References, Websites			Nader-Rifai Ph.D0		

1. Course Name:					
clinical laboratory training					
2. Course Code:					
3. Semester / Year:					
1 st and 2 nd / fifth grade					
4. Description Preparation Date:					
12/2025					
5. Available Attendance Forms:					
attendance					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2/2					
7. Course administrator's name (mention all, if more than one name)					
Name: Rasha A. Eldalawy Email: rasha.eldalawyrasha@uoturath.edu.iq Amer amir Email: ph.ameera92@gmail.com Miqat talib Email: Miqat.talib@uoturath.edu.iq					
8. Course Objectives					
Course Objectives		provide student to general information on chemical and biological analysis and laboratory diagnosis on the principles of pointing out the extent of their application and clinical diagnostics results of laboratory tests			
9. Teaching and Learning Strategies					
Strategy		Training in the specific laboratories making reports for each experiment			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2hr	Students gained information in the field of lab training live up to the required level	Diagnostic test basics, collecting & transporting specimens, venipuncture, urine specimen, stool specimen.	Laboratory training	written and oral examinations
2	2hr	Students gained information in the field of lab training live up to the required level	Biochemical tests: Fasting blood glucose, Post-prandial glucose, Oral glucose tolerance test.	Laboratory training	written and oral examinations
3	2hr	Students gained information in the field of lab training live up to the required level	Blood urea, Blood creatinine, Creatinine clearance, Uric acid.	Laboratory training 123	written and oral examinations
4	2hr	Students gained information in the field of lab training live up to the required level	Cholesterol, Lipoproteins, triglycerides.	Laboratory training	written and oral examinations
5	2hr	Students gained information in the field of lab training live up to the required level	Blood proteins, Bilirubin. Calcium, Inorganic phosphate, Serum chloride	Laboratory training	written and oral examinations

6	2hr	Students gained information in the field of lab training live up to the required level	Alkaline phosphatase, Acid phosphatase, Alanine amiotransferase, Aspartate aminotransferase, Lactate dehydrogenase, Creatine phosphokinase.	Laboratory training	written and oral examinations
7	2hr	Students gained information in the field of lab training live up to the required level	Serological tests: VDRL, ASO- Titer, Hepatitis tests.	Laboratory training	written and oral examinations
8	2hr	Students gained information in the field of lab training live up to the required level	C-reactive protein test, Rheumatic factor test, Rosebengal test, Typhoid fever test(Widal test), Pregnancy Test.	Laboratory training	written and oral examinations
9	2hr	Students gained information in the field of lab training live up to the required level	General urine examination, urine specimen collection.	Laboratory training	written and oral examinations
10	2hr	Students gained information in the field of lab training live up to the required level	Hematological tests: RBC count, Hb, PCV, RBC indices, WBC count, Platelets count.	Laboratory training	written and oral examinations
11	2hr	Students gained information in the field of lab training live up to the required level	Blood typing, Coombs test, Bleeding time, ESR.	Laboratory training	written and oral examinations
12	2hr	Students gained information in the field of lab training live up to the required level	Microbiological tests: culture and sensitivity tests, Staining methods	Laboratory training 124	written and oral examinations
13	2hr	Students gained information in the field of lab training live up to the required level	Culture media, Enriched culture media for general use	Laboratory training	written and oral examinations
14	2hr	Students gained information in the field of lab training live up to the required level	Tests for identification of bacteria, Disk diffusion tests of sensitivity to antibiotics	Laboratory training	written and oral examinations
15	2hr	Students gained information in	Choice of drugs for disk test, bacterial	Laboratory training	written

		the field of lab training live up to the required level	disease and their laboratory diagnosis		and oral examinations
11. Course Evaluation					
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Laboratory training booklet (prepared by members of the clinical laboratory science department)		
Main references (sources)			- Henry's Clinical Diagnosis And Management by Laboratory Methods. 24th ed.; 2021.		
Recommended books and references (scientific journals, reports...)			- Clinical Laboratory Methods: Atlas of Commonly Performed Tests. 2022.		
Electronic References, Websites			Google scholar-research gate		

1. Course Name:					
Applied Therapeutics II					
2. Course Code:					
CpAt2565					
3. Semester / Year:					
Second semester/ Fifth					
4. Description Preparation Date:					
2025					
5. Available Attendance Forms:					
On campus					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2 Hours /2 Units					
7. Course administrator's name (mention all, if more than one name)					
Name: Zainab Taha Mohammed Jaddoa Email: zainab.taha@uoturath.edu.iq					
8. Course Objectives					
Course Objectives		- It provides students with the basic knowledge about pathophysiology, symptoms and aims of treatment for some cancers, endocrine, gynecological, psychiatric, and neurological disorders - It provides students with the basic knowledge about medications use, dose considerations, side effects, treatment algorithms and evaluation of therapeutic outcomes for the aforementioned disorders			
9. Teaching and Learning Strategies					
Strategy		Lectures Seminars Simple quizzes Brainstorming questions			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	1. Explain the regulation and physiologic roles of hormones produced by the adrenal glands. 2. Recognize the clinical presentation of adrenal insufficiency. 3. Describe the pharmacologic	Adrenal gland disorders	Lectures and Discussions	Simple quizzes

1. Course Name:					
Therapeutic drug monitoring					
2. Course Code:					
CpTd 566					
3. Semester / Year:					
Second semester/ Fifth					
4. Description Preparation Date:					
2025					
5. Available Attendance Forms:					
On campus					
6. Number of Credit Hours (Total) / Number of Units (Total)					
4Hours /3Units					
7. Course administrator's name (mention all, if more than one name)					
Name: Assistant lecturer Dr. Aya Nabeel Yasser Email: aya.nabeel@uoturath.edu.iq Name: Assistant lecturer Dr. Miqat Talib Hamada Email: miqat.talib@uoturath.edu.iq					
8. Course Objectives					
Course Objectives			At the end of this unit, the student should be able to: recognize characteristics of drugs that make them good candidates for TDM, describe appropriate indications for TDM, understand the factors that may affect the measured concentrations list, and discuss the importance of information needed when requesting drug concentration interpret measured drug concentrations adjust dose based on TDM.....		
9. Teaching and Learning Strategies					
Strategy		Lectures Seminars Simple quizzes Brainstorming questions			
		127			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	4	1. Discuss the goal of therapeutic drug monitoring 2. Discuss the need for therapeutic drugs. 3. Identify the four principle biological events associated with pharmacokinetics. 4. Identify route(s) that drugs can be eliminated. 5. Define the following: a. TDM b. linear and nonlinear pharmacokinetics c. Pharmacokinetics parameters d. Half-life e. volume of distribution f. clearance	Chapter one: (Clinical Pharmacokinetic and Pharmacodynamic Concepts)	Lectures, Discussions	Simple quizzes
2	4	1. Discuss the applied equations that used to measure the drug concentration 2. Discuss the applied equations that used to measure the individualized pharmacokinetic parameters 3. Discuss the equations that used to measure the dose and loading dose	Chapter two: Clinical Pharmacokinetic Equations and Calculations	Lectures, Discussions	Simple quizzes
3	4	1- Discuss the effect of kidney, liver disease, and heart disease on the drug's pharmacokinetics. 2- Discuss the effect of obesity on the pharmacokinetics of the drug	Chapter Three: Drug dosing in special population	Lectures, Discussions	Simple quizzes
4	4	1. Identify why we need to monitor drug concentration for aminoglycoside 2. Determine the applied pharmacokinetics methods and equations to calculate the initial dose 3. Determine the applied pharmacokinetics methods and equations to calculate the individualized dose	Chapter four: Aminoglycoside	Lectures, Discussions	Simple quizzes

5	4	1. Identify why we need to monitor drug concentration for vancomycin 2. Determine the applied pharmacokinetics methods and equations to calculate the initial dose 3. Determine the applied pharmacokinetics methods and equations to calculate the individualized dose	Chapter five: vancomycin	Lectures, Discussions	Simple quizzes
6	3	1. Identify why we need to monitor drug concentration for digoxin 2. Determine the applied pharmacokinetics methods and equations to calculate the initial dose 3. Determine the applied pharmacokinetics methods and equations to calculate the individualized dose	Chapter six: Digoxin	Lectures, Discussions	Simple quizzes
7	3	1. Identify why we need to monitor drug concentration for phenytoin 2. Determine the applied pharmacokinetics methods and equations to calculate the initial dose 3. Determine the applied pharmacokinetics methods and equations to calculate the individualized dose	Chapter seven: phenytoin	Lectures, Discussions	Simple quizzes
8	3	1. Identify why we need to monitor drug concentration for valproic acid 2. Determine the applied pharmacokinetics methods and equations to calculate the initial dose 3. Determine the applied pharmacokinetics methods and equations to calculate the individualized dose	Chapter eight: valproic acid	Lectures, Discussions	Simple quizzes

20 midterm exam + 20 Laboratory + 60 Final exam	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Applied Clinical Pharmacokinetics by Larry
Main references (sources)	Applied Clinical Pharmacokinetics by Larry
Recommended books and references (scientific journals, reports...)	Applied therapeutics
Electronic References, Websites	Review articles

Hospital training					
2. Course Code:					
568 CpHt					
3. Semester / Year:					
Second semester/ Fifth					
4. Description Preparation Date:					
2025					
5. Available Attendance Forms:					
On campus					
6. Number of Credit Hours (Total) / Number of Units (Total)					
4 hours / 2 Units					
7. Course administrator's name (mention all, if more than one name)					
Name: lecturer Dr.Mohammed Mozahim Azeez Email: Mohamed.mozahim@uoturath.edu.iq Name: Lecturer. Dr.Zainab Taha Jadoa Email: zainab.taha@uoturath.edu.iq Name: Assistant. Lecturer. Aya Nabeel Yassir Email: aya.nabeel@uoturath.edu.iq					
8. Course Objectives					
Course Objectives		To teach students the application of pharmacy practice in diffe hospital wards; it includes Training on case evaluation and follow up Evaluation of therapeutic regimens and registration of er related to drug therapy and presenting ideas to solve problems			
9. Teaching and Learning Strategies					
Strategy	Explaining cases of patients in different hospital wards Discussions with board students in hospital Brainstorming questions				
10. Course Structure					
Wee k	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-4	4	The course aims to equip students with essential clinical skills, with a strong focus on the management of hospitalized patients. Students will be trained to effectively interpret and handle: Patient medical charts Laboratory data Diagnostic reports, including echocardiography, MRI, CT scans, and Doppler studies The course also emphasizes: Monitoring therapeutic plans and identifying drug–drug interactions	Internal medicine	☐ Explanation and discussion of clinical cases with the course instructor, a Board-Certified Clinical Pharmacist. ☐ Training students on how to obtain patients' medical and medication	Short written examinations and review of clinical cases

		Detecting medication errors and discussing appropriate therapeutic alternatives Clinical monitoring and patient follow-up Systems and Diseases Covered The course covers diseases related to the following systems: Cardiovascular system Renal system Respiratory system Gastrointestinal system Endocrine system Nervous system Infectious diseases		histories through direct patient interviews.	
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5-8	4	To provide the students the essential clinical pharmacy skills with emphasis on dealing with patients, medical charts, laboratory information, and clinical monitoring. The following topics will be covered: Pediatric Neonatology, Pediatric Nephrology, Pediatric Infections, Pediatric Neurology, Pediatric Cardiology, Pediatric Gastroenterology, Pediatric Respiratory Disorders, and pediatric endocrinology	pediatrics	☐ Explanation and discussion of clinical cases with the course instructor, a Board-Certified Clinical Pharmacist. ☐ Training students on how to obtain patients' medical and medication histories through direct patient interviews.	Short written examinations and review of clinical cases
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9-12	4	To provide the students the essential clinical pharmacy skills with emphasis on dealing with patients, medical charts, laboratory information, and clinical monitoring. The following topics will be covered: Surgical Prophylaxis, Types of surgery Surgical Operations, Preoperative bowel preparation, Intravenous fluid therapy, Blood transfusion and blood products, Perioperative care and diabetes, Perioperative medication management, Acute appendicitis, Gallstones, Common bile duct stones, Thyroidectomy, Bowel Obstruction, Pancreatitis,		Explanation and discussion of clinical cases with the course instructor, a Board-Certified Clinical Pharmacist. □ Training students on how to obtain patients' medical and medication histories through direct patient interviews	Short written examinations and review of clinical cases
		Hernia, Guidelines on Parenteral Nutrition in Surgery.			
13-16	4	To provide the students the essential clinical pharmacy skills with emphasis on dealing with patients, medical charts, laboratory information, and clinical monitoring. The following topics will be covered: Abortion, Common Complications Of Pregnancy, Induction and Augmentation of labour, Obstetric hemorrhage, Caesarean section, Ectopic Pregnancy, Heavy and irregular Menstruation, Polycystic Ovarian Syndrome, Molar Pregnancy, some drugs that are used in obstetrics and gynecology	Obstetrics gynecology	Explanation of patients cases and discussion with lecturer specialist in clinical pharmacy 133	Quizzes and case presentation
11. Course Evaluation					
34 quizzes, 6 case presentation, 60 final exam.					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Manuals for Clinical Training Adopted by the		

Main references (sources)	Manuals for Clinical Training Adopted by Department
Recommended books and references (scientific journals, reports...)	Pharmacy times (journal) Us pharmacist (journal)
Electronic References, Websites	Uptodate resource, Medscape

1. Course Name:	
Pharmaceutical Biotechnology	
2. Course Code:	
PPb570	
3. Semester / Year:	
Second Semester / Fifth Year	
4. Description Preparation Date:	
12/2025	
5. Available Attendance Forms:	
Attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2credits 2 hours / week	
7. Course administrator's name (mention all, if more than one name)	
Name: Sanarya Thamer Naser Email: sanaria.thamer@uoturath.edu.eg	
8. Course Objectives	
Course Objectives	This course is aimed to -Provide students with the molecular basis of therapeutic protein production using biotechnology. -Explain the physicochemical properties of proteins and their impact on stability and degradation. -Introduce recombinant protein production and purification techniques. -Describe pharmacokinetic and immunogenic principles of biologics. -Differentiate between biologics, biosimilars, vaccines, and gene-based therapies. -Discuss clinical applications of monoclonal antibodies and advanced biotechnological products.
9. Teaching and Learning Strategies	
Strategy	-interactive lectures - Scientific discussions - Case-based learning - Problem-based learning
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Explain the scope of pharmaceutical biotechnology and its role in modern drug development.	Introduction to Molecular Biotechnology	Interactive lecture, discussion	Written exam
2	2	Describe the structure, physicochemical properties, and stability of proteins and peptides.	Biophysical and Biochemical Characteristics of Proteins	Lecture, discussion	Written exam
3	2	Explain degradation pathways of proteins and analytical methods used for characterization.	Protein Stability and Characterization	Lecture, case discussion	Written exam
4	2	Describe recombinant DNA technology and host systems used for protein expression.	Production of Recombinant Proteins	Lecture, problem-based learning	Written exam
5	2	Explain upstream and downstream processing techniques including fermentation and purification.	Expression and Purification of Recombinant Proteins	Lecture, discussion	Written exam
6	2	Discuss formulation challenges of biologics and the role of excipients in protein stability.	Formulation of Biologics	Lecture, discussion	Written exam
7	2	Describe gene therapy concepts, vectors, and clinical challenges.	Gene Therapy and Advanced Therapy Medicinal Products	Lecture, discussion	Written exam
8	2	Discuss development, regulatory aspects, and case studies of biosimilars.	Biosimilars and Biobetters	Lecture, discussion	Written exam
9	2	Explain recombinant vaccines and modern vaccine technologies.	Recombinant Vaccines and Vaccine Technology	Lecture, discussion	Written exam
10	2	Describe monoclonal antibodies used in cancer and inflammatory diseases.	Monoclonal Antibodies in Cancer and Inflammatory Diseases	Lecture, case discussion	Written exam
11	2	Explain principles, clinical indications, and limitations of therapeutic cytokines.	Therapeutic Cytokines	Lecture, discussion	Written exam
12	2	Integrate theoretical concepts of pharmaceutical biotechnology and	Review and Integration	Tutorial, discussion	Oral assessment

		relate them to clinical applications.			
11. Course Evaluation					
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			pharmaceutical Biotechnology: Fundamentals and Applications, 5th Edition – Daan J. A. Crommelin.		
Main references (sources)			Biotechnology and Biopharmaceuticals: Transforming Drugs and Development – Rodney J. Y. H		
Recommended books and references (scientific journals, reports...)			Biotechnology Advances		
Electronic References, Websites			Google Scholar, Research gate		

1. Course Name:					
Drug Delivery Systems					
2. Course Code:					
PDF569					
3. Semester / Year:					
Second semester /fifth year					
4. Description Preparation Date:					
12/2025					
5. Available Attendance Forms:					
Attendance					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2 credits - 2 hours / week					
7. Course administrator's name (mention all, if more than one name)					
Name: Sanarya Thamer Naser Email: sanaria.thamer@uoturath.edu.iq					
8. Course Objectives					
Course Objectives			This course aims to: Explain the stages of drug development from discovery to regulatory approval. Introduce the principles and applications of conventional and advanced drug delivery systems. Describe physicochemical and physiological factors affecting drug absorption and distribution. Familiarize students with modern delivery systems including nasal, ocular, pulmonary, transdermal, and nanotechnology-based systems. Evaluate the safety, effectiveness, and clinical relevance of various drug delivery platforms		
9. Teaching and Learning Strategies					
Strategy	Interactive lectures Scientific discussions Case studies Problem-based learning 138				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1–3	6	New Drug Development and Approval ProcessIntroduction, Drug discovery and drug design, Biologic characterization, Early formulation studies, Investigational New Drug (IND) application, New Drug Application (NDA),	Explain stages of new drug development, describe drug discovery and design, understand biologic characterization	LecturesCase-based discussion	QuizzesMid-term exam

		supplemental, abbreviated and other applications, International Conference on Harmonization (ICH).Reference: Chapter 2, Pharmaceutical Dosage Forms and Drug Delivery Systems (Howard A. Ansel, 11th ed., 2017).	and early formulation studies, and differentiate between regulatory drug applications and international harmonization requirements.		
4–7	7	Pharmaceutical Nanotechnology and NanomedicinesIntroduction, Applications, Polymer–drug conjugates, Dendrimers, Micelle systems, Solid nanoparticles, Liposomes, bilayer vesicles and lipid nanoparticles, Microcapsules and microspheres, Ongoing developments.Reference: Chapter 46, Aulton’s Pharmaceutics (6th ed., 2022).	Describe principles and applications of pharmaceutical nanotechnology, classify nanomedicine systems, compare different nanoparticle-based drug delivery systems, and evaluate recent developments.	LecturesGroup discussion	QuizzesAssignments
7–9	4	Nasal Drug DeliveryIntroduction, Anatomy and physiology, Drug delivery mechanisms, Nasal delivery systems.Reference: Chapter 40, Aulton’s Pharmaceutics (6th ed., 2022).	Explain nasal anatomy and physiology, describe mechanisms of nasal drug absorption, and differentiate nasal drug delivery systems.	Lectures	Quizzes
9–11	5	Ocular Drug DeliveryAnatomy and physiology of the eye, Common ocular conditions, Topical ophthalmic preparations, Formulation considerations, Barriers to ocular drug absorption, Increasing solubility and absorption, Sterility, Ocular pharmacokinetics, Posterior segment targeting, Patient adherence.Reference: Chapter 41, Aulton’s Pharmaceutics (6th ed., 2022).	Explain ocular drug delivery principles, identify formulation challenges, evaluate strategies to enhance ocular bioavailability, and discuss patient adherence issues.	LecturesCase studies	QuizzesAssignments

12–13	4	Transdermal Drug Delivery SystemsIntroduction, Factors affecting percutaneous absorption, Absorption enhancers, Absorption models, Design of TDDSs, Advantages and disadvantages, Patches and tapes, Clinical considerations.Reference: Chapter 11, Pharmaceutical Dosage Forms and Drug Delivery Systems (Howard A. Ansel, 11th ed., 2017).	Describe principles of transdermal drug delivery, analyze factors affecting skin absorption, and evaluate TDDS design and clinical use.	LecturesDiscussion	Quizzes
14–15	4	Pulmonary Drug DeliveryInhaled drug delivery, Formulation and delivery of inhalation aerosols, Aerosol size analysis methods.Reference: Chapter 39, Aulton's Pharmaceutics (6th ed., 2022).	Explain pulmonary drug delivery systems, describe aerosol formulation and delivery, and analyze particle size and lung deposition.	Lectures	QuizzesFinal exam

11. Course Evaluation

Marks are distributed out of 100 based on: Written examinations, Oral examinations ,Assignments and reports and Class participation

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Aulton's Pharmaceutics: The Design and Manufacture of Medicines, 6th Edition, 2022.
Main references (sources)	Pharmaceutical Dosage Forms and Drug Delivery Systems – Howard A. Ansel, 11th Edition, 2017.
Recommended books and references (scientific journals, reports...)	Journals of drug delivery sciences
Electronic References, Websites	Google scholar Resch gate

1. Course Name:					
Advanced pharmaceutical analysis					
2. Course Code:					
PcAp567					
3. Semester / Year:					
2025-2026					
4. Description Preparation Date:					
3\2026					
5. Available Attendance Forms:					
On campus					
6. Number of Credit Hours (Total) / Number of Units (Total)					
45 credits\4 units					
7. Course administrator's name (mention all, if more than one name)					
Name: ALI HAYDER HAMZAH ALWASH Email: ALI.HAYDER@UOTURATH.EDU.IQ					
8. Course Objectives					
Course Objectives			-understanding the principles of the spectrum • Recognizing the different types of spectrums (UV-Vis, IR, NMR, mass) • Uses of spectroscopy in the characterization of organic compounds • Practice practical methods for different spectrum measurements • Allows the students to find the essential knowledge and skills for using The spectroscopic machines and how to interpret data. • The learned skills by students would help them in their postgraduate career, such as drug manufacturing, quality control, or scientific research.		
9. Teaching and Learning Strategies					
Strategy		- Theoretical lectures covering all concepts of each method - Writing reports and conducting research on the applications of the methods mentioned above on different chemical compounds and pharmaceutical preparations - Showing scientific videos to help understand the material and gain the skill - utilizing methodological and supporting books - Holding scientific sessions in the form of discussions or seminars			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
6	1-2	Explain the principles and the applications for UV-Vis spectroscopy.	UV and visible	Lectures	Oral-written exams
14	3-7	Learn students' theory and pharmaceutical applications of IR spectroscopy.	IR spectroscopy	Lectures	Oral-written exams
12	8-10				

11	11-14	Study the principles the applications for the ^1H -NMR and ^{13}C -NMR spectroscopy methods.	NMR spectroscopy	Lectures	Oral-Written exams
2	15	Teach students about the principle, applications, types, fragmentations methods of Mass spectroscopy.	Mass spectroscopy	Lectures	Oral-written exams
		Explain the principles and ^{16}O the applications for CHNO elemental analysis.	Elemental analysis	Lectures	Oral-Written exams

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc
 15 credits- practical part
 25 credits theoretical part
 60 credits final exam

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1-Spectrometric Identification of Organic Compounds by Silverstein, Bassler and Morrill. 2-Applications of absorption spectroscopy of organic compounds by Dyer JR.
Main references (sources)	1-Spectrometric Identification of Organic Compounds by Silverstein, Bassler and Morrill. 2-Applications of absorption spectroscopy of organic compounds by Dyer JR.
Recommended books and references (scientific journals, reports...)	Organic Chemistry by McMurry; 5th ed; Thomson learning CA, USA 2000
Electronic References, Websites	Google scholar, Researchgate

1. Course Name:					
Pharmacoeconomics					
2. Course Code:					
563 GP					
3. Semester / Year:					
2 nd semester/ 5 th year students					
4. Description Preparation Date:					
March 26 2026					
5. Available Attendance Forms:					
Class attendance (on-campus)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2 hours/2 Units					
7. Course administrator's name (mention all, if more than one name)					
Name of the First instructor of the Course: Dr. Zainab Taha Mohammed					
Degree: Board degree of clinical pharmacy					
E-mail: Zainab.taha@uoturath.edu.iq					
Name of the second instructor of the Course: Ameer Amer					
Degree: Master in biochemistry					
E-mail: Ameer.amer@turath.edu.iq					
8. Course Objectives					
Course Objectives			Course Objectives		
9. Teaching and Learning Strategies					
Strategy		Strategy			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	1. Introduce Pharmacoeconomic principles. 2. Demonstrate types of healthcare costs with examples 3. Learn about ECHO model for the 3 patient outcome types. 4. Explain and differentiate among the 4 methods of Pharmacoeconomic analyses.	Basic principle of Pharmacoeconomics	Interactive lectures and related articles 143	Simple quizzes

2	4	1. Identifying costs 2. Types of costs (Direct Medical Costs, Direct Nonmedical Costs, Indirect costs, Intangible costs) 3. Incremental costs and marginal costs 4. Opportunity costs 5. How are costs valued? Timing Adjustments for Costs	Cost analysis	Interactive lectures and related articles	Simple quizzes
3	4	1. Understand the Cost-effectiveness analysis 2. Outcome measures in cost-effectiveness analysis 3. Knowing how to calculate Cost- effectiveness Ratios	Cost-minimizing analysis and Cost effectiveness analyses (CEA).	Interactive lectures and related articles	Simple quizzes
4	4	1. Understand the Cost- Benefit Analysis method. 2. Knowing how to calculate the indirect cost of the disease and indirect benefit of the intervention/program using Human Capital Method (HCM). 3. Using HCM to calculate Daily wage rate and Missed days to find out the indirect benefit of the intervention/management. 4. Describe in details Willingness-to-Pay Method (WTP): Hypothetical Scenario & Bidding Vehicles 5. Formats for presenting Cost-Benefit Analysis (CBA)	Cost-benefit analysis (CBA)	Interactive lectures and related articles 144	Simple quizzes

		When should we select Cost-Benefit or Cost-Effectiveness Analysis?			
5	4	1. Use of decision analysis to design economic evaluations 2. Decision Analysis Structure or tree	Critical assessment of economic evaluation	Interactive lectures and related articles	Simple quizzes
6	4	1. Define Cost of illness 2. Knowing how to calculate Cost of illness 3. Understand the difference between healthcare costs and Cost of illness	Drug-focused versus disease-focused framework for conducting Pharmacoeconomic analyses.	Interactive lectures and related articles	Simple quizzes
7	4	The students should be able to: 1. Understand how to measure utility outcomes 2. identify types of data sources. 3. identify basic methods of data collection and interpretation.	Cost-utility analysis	Interactive lectures and related articles	Simple quizzes
8	1	Define the concept of Cost of Illness (COI) and explain its role in pharmacoeconomics and health policy. • Differentiate COI studies from other economic evaluation methods (e.g., cost-minimization, cost-effectiveness, cost-utility, cost-benefit). • Identify the types of costs included in COI studies (direct, indirect, and intangible costs). • Describe the methodological approaches used to design and conduct COI studies.	Cost-of -illness study	Interactive lectures and related articles 145	

		Analyze examples of COI studies to understand their application in medical, pharmaceutical, and public health contexts.			
9	2	Define the fundamental concepts of cost and cost analysis within the framework of health program evaluation. Identify the five key components of costing study design, including perspective, population, cost type, unit of measurement, and time horizon. Differentiate between Financial Costs (direct expenditures) and Economic Costs (which include opportunity costs and donated resources). Categorize program inputs into distinct groups, such as Capital vs. Recurrent, Direct vs. Indirect, and Fixed vs. Variable costs. Evaluate the strengths and weaknesses of different data collection timings (Prospective vs. Retrospective). Contrast the methodologies of Top- Down (Gross Costing) and Bottom-Up (Micro- costing) approaches, including specialized	Cost-analysis	Interactive lectures and related articles	

		methods like Activity- Based Costing (ABC).			
10	2	Cost-Effectiveness assignment is to teach students how to understand the terminologies used in published Pharmacoeconomic studies.	Assignment submission		Summarizing and writing skills
11. Course Evaluation					
5 points for quizzes and assignments, 25 points for midterm exam and 70 points for the final exam					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)		Bootman JL, Townsend RJ, McGhan WF, (Eds.), Principles Pharmacoeconomics, 2nd ed., Harvey Whitney Books Compa Cincinnati, Oh, latest edition Renée J.G. Arnold. Pharmacoeconomics From Theory to Practice. Second Edition, 2021. CRC Press, Boca Raton, FL, USA			
Main references (sources)		Hasan Raid, Ali Azeez Al-Jumaili , Nizar Abdulateef Al Ani. Refere Infiximab (Remicade) compared to its biosimilar (Remsima) in patie with Ankylosing spondylitis: A Field-based Pharmacoeconomic study. Kindy College Medical Journal. April 30, 2023:19 https://doi.org/10.47723/kcmj.v19i1.908 Hasan Raid Fadhil, Ali Azeez Al-Jumaili , and Nizar Abdulateef Al A Cost-effectiveness Analysis of Reference Infiximab (Remica Compared to its Biosimilar (Remsima) in Iraqi Patients with Rheumat Arthritis. Iraqi J Pharm Sci, Vol.31(Suppl.) 20 https://doi.org/10.31351/vol31issSuppl.pp100-110			
Recommended books and references (scientific journals, reports...)		Value in Health Journal 147 Value in Health Journal ScienceDirect.com by Elsevier Value in Health Journal Regional Issues https://www.valuehealthregionalissues.com/			
Electronic Websites		References, Value in Health Journal and Value in Health Journal Regional Issu			

1. Course Name:	
Organic Pharmaceutical Chemistry IV	
2. Course Code:	
PcOP4557	
3. Semester / Year:	
First Semester / 2025-2026	
4. Description Preparation Date:	
2025	
5. Available Attendance Forms:	
On campus	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30/2	
7. Course administrator's name (mention all, if more than one name)	
Name: ALI HAYDER HAMZAH ALWASH Email: ALI.HAYDER@UOTURATH.EDU.ORG	
8. Course Objectives	
Course Objectives	a. Knowledge 1. Studying updated advanced drug design strategies. 2. Obtaining knowledge on recent strategies that are implemented to improve the pharmacological activity of available drugs through modifying them into prodrugs that will be activated inside the body. 3. Getting knowledge of computer software utilized in drug design and improvement of drug properties. b. Skills 1. Training and practicing in silico drug design 2. Improve students' skills in how to benefit from acquired experience in improving the scientific and academic aspects. Learning and teaching methods 1. Lectures 2. student-based Interactive open discussion 3. Homework and scientific weekly reports 4. Oral and written tests. c. C. Attitude 1. Practicing drug design techniques 2. Acquired advantages from chemical modifications of drugs to improve their properties d. other skills developed through the course (Related to personal development and employment). 1. Utilizing computer software in drug design 2. Students will be assured of being qualified pharmacy personnel

			3. Students will become independent scientists.		
9. Teaching and Learning Strategies					
Strategy		1. Daily oral evaluation 2. Written exams 3. Student's scientific research			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-3	6	6j	Basic principles of Prodrugs	Lectures	oral and written exams
4-6	6		Polymeric prodrugs	Lectures	oral and written exams
7-8			Targeting drugs	Lectures	exams
9-12	4		Combinatorial chemistry	Lectures	oral and written exams
13-15	8		Computer-based drug design	Lectures	exams
	6				oral and written exams
					oral and written exams
11. Course Evaluation					
Distributing the score out of 100 according to the tasks assigned to the student, such as daily contribution, daily oral, monthly, or written exams, reports, etc 30 marks for mid-term exams, quizzes, and oral discussions. 70 marks for the final term exam					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Wilson and Gisvold Textbook of Organic Medicinal and Pharmaceutical Chemistry, Block JH, Beale JM, Jr.; 12th ed, 2004		
Main references (sources)			Wilson and Gisvold Textbook of Organic Medicinal and Pharmaceutical Chemistry, Block JH, Beale JM, Jr.; 12th ed. 2004 Fundamentals in Medicinal Chemistry, Gareth Thomas: Combinatorial Chemistry, Chapter 6.		
Recommended books and references (scientific journals, reports...)					
Electronic References, Websites			PubMed,English-Pharmaceutical Google Scholar		