وزارة التعليم العالي والبحث العلمي
Ministry of Higher Education & Scientific Research

جامعة كلكامش
GILGAMESH UNIVERSITY

University Name: Gilgamesh University

Faculty/Institute: College of Pharmacy

Academic or Professional Program Name:

Final Certificate Name: Bachelor of Pharmacy

Academic System: .....

Description Preparation Date: Quarterly

File Completion Date:

Signature:
Head of Department Name:
Date:

Signature:
Scientific Associate Name: Ahmed yaseen Al Shara
30/6
Date:

The file is checked by:
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department:
Date:

أ.م.د. علي محمد علي
٢٠٢٦/٦/٣٠

1. Program Vision

To achieve excellence and leadership in pharmaceutical education, scientific research, and community service by preparing qualified pharmacists in accordance with quality assurance and academic accreditation standards.

2. Program Mission

The College is committed to delivering high-quality pharmaceutical education through advanced academic and training programs that integrate scientific knowledge, practical skills, and professional ethics to prepare competent pharmacists who contribute to healthcare development.

3. Program Objectives

1. Prepare scientifically and professionally qualified pharmacists.
2. Develop curricula in line with modern pharmaceutical sciences.
3. Promote applied research in pharmaceutical fields.
4. Integrate theory with practical and clinical training.
5. Enhance professional ethics among students.
6. Provide pharmaceutical services to the community.
7. Establish local and international partnerships.
8. Support innovation in pharmaceutical industries.

4. Program Accreditation

Does the program have program accreditation? And from which agency?

5. Other external influences

Is there a sponsor for the program?

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	٦٥	١٨١		
College Requirements				
Department Requirements				
Summer Training				
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		Analytical Chemistry	3	2
First Year		Human Biology	٢	2
First Year		Principles of Pharmacy Practice	2	-
First Year		Mathematics and Biostatistics	3	-
First Year		Computer Science	١	2
First Year		Medical Terminology	1	-
First Year		Democracy &Human right	2	-

First Year		Organic Chemistry I	3	2
First Year		Medical Physics	2	2
First Year		Pharmaceutical Calculations	2	2
First Year		Histology	2	2
First Year		Human Anatomy	1	2
First Year		Computer Science	١	2
Second Year		Medical Microbiology I	3	2
Second Year		Physiology I	3	2
Second Year		Physical Pharmacy I	3	2
Second Year		Organic Chemistry II	3	2
Second Year		Baath Party Crimes	2	-
Second Year		Computer Science	١	2
Second Year		Physiology II	3	2
Second Year		Pharmacognosy I	3	2
Second Year		Medical Microbiology II	3	2
Second Year		Physical Pharmacy II	3	2
Second Year		Organic Chemistry III	2	2
Second Year		Computer Science	١	2
Third Year		Biochemistry I	3	2
Third Year		Pharmaceutical Technology I	3	2
Third Year		Pathophysiology	3	2

Third Year		Inorganic Pharmaceutical Chemistry	2	2
Third Year		Pharmacognosy II	2	2
Third Year		Biochemistry II	3	2
Third Year		Pharmaceutical Technology II	3	2
Third Year		Organic Pharmaceutical Chemistry I	3	2
Third Year		Pharmacognosy III	2	2
Third Year		Pharmacology I	3	-
Third Year		Medical Ethics	1	-
Fourth Year		Organic Pharmaceutical Chemistry II	3	2
Fourth Year		Pharmacology II	3	2
Fourth Year		Clinical Pharmacy I	2	2
Fourth Year		Biopharmaceutics	2	2
Fourth Year		Public Health	2	-
Fourth Year		Organic Pharmaceutical Chemistry III	3	2
Fourth Year		Industrial Pharmacy I	3	2
Fourth Year		General Toxicology	2	2
Fourth Year		Clinical Pharmacy II	2	2
Fourth Year		Pharmacology III	2	-
Fourth Year		Communication skills	2	-
Fifth Year		Industrial Pharmacy II	3	2
Fifth Year		Clinical Chemistry	3	2

Fifth Year		Applied Therapeutics I	3	-
Fifth Year		Clinical Toxicology	2	2
Fifth Year		Organic Pharmaceutical Chemistry IV	2	-
Fifth Year		Hospital Training	-	4
Fifth Year		Advanced Pharmaceutical Analysis	3	2
Fifth Year		Therapeutic Drug Monitoring	2	2
Fifth Year		Pharmacoeconomy	2	-
Fifth Year		Applied Therapeutics II	2	-
Fifth Year		Dosage Form Design	2	-
Fifth Year		Clinical Laboratory Training	-	4
Fifth Year		Pharmaceutical Biotechnology	1	-
Fifth Year		Undergraduate Project	-	2

8. Expected learning outcomes of the program

Knowledge

- **Enabling the student to acquire knowledge in the fundamental subjects of medical and pharmaceutical sciences, including human biology, histology, anatomy, physiology, pathology, immunology, bacteria, and viruses.**

- **Describing the different types of drugs, their therapeutic effects, side effects, and toxicity on the human body.**

- **Understanding the theoretical foundations of manufacturing and evaluating various pharmaceutical dosage forms, as well as the optimal methods for preparation and storage of pharmaceutical products.**

- **Comprehending medical calculations, medical statistics, and medical physics.**

Skills

- **Providing the student with the ability to connect theoretical concepts and practical models to real-world applications by conducting practical experiments in college laboratories and implementing safety instructions during laboratory work.**

- **Equipping the graduate with effective communication skills to interact with medical staff, patients, and the community, regardless of their intellectual, social, psychological, or health backgrounds.**

- **Working efficiently in pharmacies through comprehensive knowledge of the specific requirements of drug dispensing, guiding patients on proper usage, and providing them with appropriate counseling.**

Ethics

- **Enabling students to work in a team spirit and to use teamwork, leadership, and creative skills.**

- **The ability to take responsibility and make correct decisions that serve the patient's best interests.**

- **Commitment of the student to the ethics of the pharmacy profession.**

- **Applying the principles and methodologies of scientific research when conducting and evaluating pharmaceutical and clinical research, including adherence to research ethics.**

9. Teaching and Learning Strategies

- **Brainstorming Strategy**

- **Group Work Strategy**

- **Discussion Strategy**

- **Case Study Strategy**

- **Inductive Teaching Strategy**

- **Concept Mapping Strategy**

- **Self-Learning Strategy**

- **E-Learning Strategy**

- **Study Strategy**

- **Inference Strategy**
- **Spaced Practice Strategy**
- **Interleaving Strategy**
- **Using Examples Strategy**

10. Evaluation methods

a. Daily quizzes
b. Midterm exams
c. Weekly reports
d. Daily attendance and participation
e. Practical exams in hospitals
f. Graduation research project

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Lecturer	3	6			8	1
Assistant Lecturer	–	5			5	–

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.
Professional development of faculty members
Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. **Acceptance Criterion**
(Setting regulations related to enrollment in the college or institute, whether central admission or others)

13. **The most important sources of information about the program**
State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
First Year		Analytical Chemistry		*	*	*	*	*	*	*	*	*	*	*	*
		Human Biology		*	*	*	*	*	*	*	*	*	*	*	*
First Year		Principles of Pharmacy Practice		*	*	*	*	*	*	*	*	*	*	*	*
		Mathematics and Biostatistics		*	*	*	*	*	*	*	*	*	*	*	*
First Year		Computer Science		*	*	*	*	*	*	*	*	*	*	*	*
		Medical Terminology		*	*	*	*	*	*	*	*	*	*	*	*

First Year		Democracy & Human right		*	*	*	*	*	*	*	*	*	*	*	*	*
		Organic Chemistry I		*	*	*	*	*	*	*	*	*	*	*	*	*
First Year		Medical Physics		*	*	*	*	*	*	*	*	*	*	*	*	*
First Year		Pharmaceutical Calculations		*	*	*	*	*	*	*	*	*	*	*	*	*
First Year		Histology		*	*	*	*	*	*	*	*	*	*	*	*	*
First Year		Human Anatomy		*	*	*	*	*	*	*	*	*	*	*	*	*
First Year		Computer Science		*	*	*	*	*	*	*	*	*	*	*	*	*
Second Year		Medical Microbiology I		*	*	*	*	*	*	*	*	*	*	*	*	*
Second Year		Physiology I		*	*	*	*	*	*	*	*	*	*	*	*	*
Second Year		Physical Pharmacy I		*	*	*	*	*	*	*	*	*	*	*	*	*
Second Year		Organic Chemistry II		*	*	*	*	*	*	*	*	*	*	*	*	*

Second Year		Baath Party Crimes		*	*	*	*	*	*	*	*	*	*	*	*	*
Second Year		Computer Science		*	*	*	*	*	*	*	*	*	*	*	*	*
Second Year		Physiology II		*	*	*	*	*	*	*	*	*	*	*	*	*
Second Year		Pharmacognosy I		*	*	*	*	*	*	*	*	*	*	*	*	*
Second Year		Medical Microbiology II		*	*	*	*	*	*	*	*	*	*	*	*	*
Second Year		Physical Pharmacy II		*	*	*	*	*	*	*	*	*	*	*	*	*
Second Year		Organic Chemistry III		*	*	*	*	*	*	*	*	*	*	*	*	*
Second Year		Computer Science		*	*	*	*	*	*	*	*	*	*	*	*	*
Third Year		Biochemistry I		*	*	*	*	*	*	*	*	*	*	*	*	*
Third Year		Pharmaceutical Technology I		*	*	*	*	*	*	*	*	*	*	*	*	*
Third Year		Pathophysiology		*	*	*	*	*	*	*	*	*	*	*	*	*

Third Year		Inorganic Pharmaceutical Chemistry		*	*	*	*	*	*	*	*	*	*	*	*	*
Third Year		Pharmacognosy II		*	*	*	*	*	*	*	*	*	*	*	*	*
Third Year		Biochemistry II		*	*	*	*	*	*	*	*	*	*	*	*	*
Third Year		Pharmaceutical Technology II		*	*	*	*	*	*	*	*	*	*	*	*	*
Third Year		Organic Pharmaceutical Chemistry I		*	*	*	*	*	*	*	*	*	*	*	*	*
Third Year		Pharmacognosy III		*	*	*	*	*	*	*	*	*	*	*	*	*
Third Year		Pharmacology I		*	*	*	*	*	*	*	*	*	*	*	*	*
Third Year		Medical Ethics		*	*	*	*	*	*	*	*	*	*	*	*	*
Fourth Year		Organic Pharmaceutical Chemistry II		*	*	*	*	*	*	*	*	*	*	*	*	*
Fourth Year		Pharmacology II		*	*	*	*	*	*	*	*	*	*	*	*	*
Fourth Year		Clinical Pharmacy I		*	*	*	*	*	*	*	*	*	*	*	*	*

Fourth Year		Biopharmaceutics		*	*	*	*	*	*	*	*	*	*	*	*	*
Fourth Year		Public Health		*	*	*	*	*	*	*	*	*	*	*	*	*
Fourth Year		Organic Pharmaceutical Chemistry III		*	*	*	*	*	*	*	*	*	*	*	*	*
Fourth Year		Industrial Pharmacy I		*	*	*	*	*	*	*	*	*	*	*	*	*
Fourth Year		General Toxicology		*	*	*	*	*	*	*	*	*	*	*	*	*
Fourth Year		Clinical Pharmacy II		*	*	*	*	*	*	*	*	*	*	*	*	*
Fourth Year		Pharmacology III		*	*	*	*	*	*	*	*	*	*	*	*	*
Fourth Year		Communication skills		*	*	*	*	*	*	*	*	*	*	*	*	*
Fifth Year		Industrial Pharmacy II		*	*	*	*	*	*	*	*	*	*	*	*	*
Fifth Year		Clinical Chemistry		*	*	*	*	*	*	*	*	*	*	*	*	*
Fifth Year		Applied Therapeutics I		*	*	*	*	*	*	*	*	*	*	*	*	*
Fifth Year		Clinical Toxicology		*	*	*	*	*	*	*	*	*	*	*	*	*

Fifth Year		Organic Pharmaceutical Chemistry IV		*	*	*	*	*	*	*	*	*	*	*	*	*
Fifth Year		Hospital Training		*	*	*	*	*	*	*	*	*	*	*	*	*
Fifth Year		Advanced Pharmaceutical Analysis		*	*	*	*	*	*	*	*	*	*	*	*	*
Fifth Year		Therapeutic Drug Monitoring		*	*	*	*	*	*	*	*	*	*	*	*	*
Fifth Year		Pharmacoeconomy		*	*	*	*	*	*	*	*	*	*	*	*	*
Fifth Year		Applied Therapeutics II		*	*	*	*	*	*	*	*	*	*	*	*	*
Fifth Year		Dosage Form Design		*	*	*	*	*	*	*	*	*	*	*	*	*
Fifth Year		Clinical Laboratory Training		*	*	*	*	*	*	*	*	*	*	*	*	*
Fifth Year		Pharmaceutical Biotechnology		*	*	*	*	*	*	*	*	*	*	*	*	*
Fifth Year		Undergraduate Project		*	*	*	*	*	*	*	*	*	*	*	*	*

- **Please tick the boxes corresponding to the individual program learning outcomes under evalua**

Course Description Form

1. Course Name:
Analytical Chemistry
2. Course Code:
3. Semester / Year:
First semester, first stage 2025-2026
4. Description Preparation
1-2-2026
5. Available Attendance Forms:
attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
Total hours: 75 hours Total credit units: 4 units
7. Course administrator's name (mention all, if more than one name)
Name:Dr. Aseel Salah Email: dr.aseel.salah21@gmail.com Pharmacist : Zahraa Amer Abdul-Ameer
8. Course Objectives
Fundamentals of analytical chemistry and its components. The concept of electrons; types of strong and weak acids and bases; methods for calculating concentration and their units. Titration methods in analytical chemistry, analytical techniques, and precipitation methods.

Knowledge of organic and inorganic precipitating agents, and understanding acid–base equilibrium calculations and the pH function.

Description of titration theory for simple and complex systems, and precipitation methods.

Calculation of pH in complex systems and methods for calculating specific volume based on comple systems.

Description of oxidation–reduction (redox) theory as applied to titration.

Knowledge of spectrophotometric analysis methods and radiation absorption techniques.

9. Teaching and Learning Strategies

Knowledge of the fundamentals of analytical chemistry and their applications.

Description of titration theory in simple and complex systems.

Description of oxidation–reduction (redox) theory.

Knowledge of advanced analytical methods.

Preparation of concise reports.

10. Course Structure (theoretical and practical)

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	٢	Introduction to Analytical Chemistry: Types and roles in drug development and QC		Lecture	Quiz
2.	٢	Review of Basic Concepts: Concentration units, standards, solution preparation		Lecture	Quiz
3.	٢	Introduction to Pharmacopoeias: USP, BP, monographs, specifications		Lecture	Quiz
4.	2	Case Study: Interpreting pharmacopoeial monographs and ICH Q2(R1) overview		Lecture	Quiz
5.	٢	Gravimetric Analysis: Precipitation, weighing, error sources		Lecture	Quiz
6.	٢	Volumetric Analysis I: Acid-base titrations, indicators, pH, calculations		Lecture	Quiz
7.	٢	MID EXAM.			
8.	٢	Volumetric Analysis I: Acid-base titrations, indicators, pH, calculations		Lecture	Quiz
9.	٢	Volumetric Analysis II: Precipitation and Complexometric titrations (Mohr, EDTA)		Lecture	Quiz
10.	٢	Redox Titrations: Principles, iodometry, permanganometry		Lecture	Quiz
11.	٢	Statistical Evaluation of Data: Mean, SD, confidence limits, Q- test, Grubbs test		Lecture	Quiz
12.	٢	UV-Visible Spectrophotometry: Principles, Beer's Law, applications		Lecture	Quiz
13.	٢	Electrochemical Methods: Potentiometry, Conductometry		Lecture	Quiz
14.	٢	Introduction to Chromatography: TLC, paper chromatography		Lecture	Quiz

week	hours	Learning outcome	Subject name	Learning method	valuation
1.	2	Laboratory safety rules		lab	quiz
2.	2	Demonstration of some laboratory equipment.		lab	quiz
3.	2	Volumetric method of analysis		lab	quiz
4.	2	Preparation and standardization of HCl solution (known)		lab	quiz
5.	2	Preparation and standardization of HCl solution (unknown)		lab	quiz
6.		mid examine			
7.	2	Preparation and standardization of NaOH solution		lab	quiz
8.	2	Determination of the percentage of acetic acid.		lab	quiz
9.	2	Analysis of sodium carbonate and sodium hydroxide mixture.		lab	quiz
10.	2	Determination of chloride by the Mohr method.		lab	quiz
11.	2	Determination of chloride by the Volhard method.		lab	quiz
12.	2	Determination of ferrous form of iron in Mohr's salt.		lab	quiz
13.	2	Determination of total hardness in tab water.		lab	quiz
15		Final			

11. Course Evaluation

Assessment is distributed as follows: 20% for midterm examinations, 20% for practical assessment, and 60% for final examinations.

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Fundamentals of Analytical Chemistry – Skoog, West, Holler & Crouch Supplementary: British Pharmacopoeia (BP), United States Pharmacopeia (USP), ICH Q2(R1)
Main references (sources)	Pharmaceutical Analysis – A.H. Beckett & J.B. Stenlake
Recommended books and references (scientific journals, reports…)	Academic journals related to analytical chemistry topics
Electronic References, Websites	

Course Description Form

2-Course Name:
Human Anatomy and Histology
13. Course Code:
14. Semester / Year:
First semester, first stage
15. Description Preparation
٢٠٢٦-٢-١
16. Available Attendance Forms:
attendance
17. Number of Credit Hours (Total) / Number of Units (Total)
Total hours: 75 hours Total credit units: 4 units
18. Course administrator's name (mention all, if more than one name)
Name: PhD. Mohammed mohsin

Mohammed.Mohsin@gu.edu.iq

Assistant lecturer : alaa Mohsen ali

alaa.mohsen@gu.edu.iq

19. Course Objectives

Course Objectives

1. The general objective of teaching human anatomy is to provide essential scientific knowledge encompassing the structural composition of the body at the level of systems, organs, and cells.

2. The general objective of anatomy and histology is to provide students with comprehensive knowledge and understanding of the anatomical structure of the organs and systems of the human body, and the microscopic relationships of the tissues that comprise these organs, thus helping them to connect structure and function and understand the scientific basis of pathological changes and their clinical applications.

3. In other words:
The goal is for the student to be able to identify the components of the human body at the macroscopic (anatomical) and microscopic (histochemical) levels, and to understand how these structures are related to their vital functions, as a prelude to understanding other medical sciences such as physiology, pathology, and laboratory diagnosis.

20. Teaching and Learning Strategies

A textbook covering both theoretical and practical lectures

Use of a data projector to display illustrative videos

21. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	To understand Circulatory system Location of vascular syste	Circulatory system Location of vascular system (Heart, Arteries, Veins) Epithelial tissues Lecture title	The use of scientific references and use the board	Monthly written examinations andoral examinations
2	3	To understand Circulatory system Location of lymphatic system	Circulatory system Location of lymphatic system (Lymphatic capillary) Connective tissue and muscular tissues	The use of scientific references and use the board	Monthly written examinations andoral examinations
3	3	To understand Lymphoid tissue location of the (Thymus gland, Spleen ,Lymph nodes)	Lymphoid tissue location of the (Thymus gland, Spleen ,Lymph nodes) Structer of the lymphatic system(Lymphatic capillary)	The use of scientific references and use the board	Monthly written examinations andoral examinations
4	3	To understand Lymphoid nodule (MALT) and Tonsils	Lymphoid nodule (MALT) and Tonsils	The use of scientific references and use the board	Monthly written examinations andoral examinations
5	3	To understand Nervous system Central & Peripheral nervous	Nervous system Central & Peripheral nervous system by location	The use of scientific references and use the board	Monthly written examinations andoral examinations

		system by location			
6	3	To understand Respiratory system	Respiratory system Conducting portion (Nose, Nasopharynx, Trachea Bronchus and Bronchioles(Respiratory portion (Lung)	The use of scientific	Monthly written examinations and
7	3	To understand Digestive system location of different parts of digestive tract (GIT	Digestive system location of different parts of digestive tract (GIT) (Oral cavity, Mouth, Esophagus and Stomach(Small intestine, Large intestine, Rectum and Anus.	The use of scientific references anduse the board	Monthly written examinations andoral examinations
8	3	To understand Digestive system Glands associated with the digestive tract by location	Digestive system Glands associated with the digestive tract by location (Salivaryglands, Pancreas, Liver and Gall bladder).	The use of scientific references and use the board	Monthly written examinations andoral examinations
9	3	To understand Endocrine system	Endocrine system location of the pituitary gland location of the Adrenal, Thyroid, Parathyroid, Islet of Langerhans & Pineal glands General structer of the Adrenal, Thyroid,	The use of scientific references anduse the board	Monthly written examinations andoral examinations

			Parathyroid, Islet of Langerhans & Pineal glands		
10	3	To understand Male reproductive system	Male reproductive system location of the testes Excretory genital ducts Excretory genital glands (Seminal vesicles, Prostate and Cowper's glands)	The use of scientific references and use the board	Monthly written examinations andoral examinations
11-١٢	٦	To understand Female reproductive system	Female reproductive system location of ovary, Oviduct, Uterus & Vagina- General structer of ovary, Oviduct, Uterus & Vagina Stages of follicle development Ovulation	The use of scientific references and use the board	Monthly written examinations and oral examinations
-١٣ -١٤ ١٥	٩	To understand Urinary system	Urinary system location of the (kidney &nephrone) location of the (Ureter, Bladder & Urethra)	The use of scientific references and use the board	Monthly written examinations and oral examinations

Course description (practical)		
weeks	Laboratory sessions & *Clinical requirements*	hours
1	Circulatory system 2	4
2	Location of vascular system (heart, Arteries,Veins)	2
3	Epithelial and connective tissue	4
4	Blood cell ,arteries and vein	2
5	Digestive system 2	4
6	Location of different parts of digestive tract (GTI)	2
7	(Oral cavity , Mouth , Esophagus, and Stomach)	2
8	Small intestine ,Large intestine ,Rectum and Anus	2
9	Endocrine system	4
10	Location of the pituitary gland	2
11	Location of the Adrenal , Thyroid, Parathyroid, Islet of Langerhans and Pineal glands	2

1. Course evaluation
   weekly examination
   reports
   Homeworks

2. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	Clinical Anatomy. By Regions edition, 2010 th Snell RS.
Electronic References, Websites	Moore, K.: Essential Clinical Anatomy

Course Description Form

4-Course Name:
Democracy and Human Rights
22. Course Code:
23. Semester / Year:
First semester, first stage, 2025-2026
24. Description Preparation Date:
٢٠٢٦-٢-١
25. Available Attendance Forms:
attendance
26. Number of Credit Hours (Total) / Number of Units (Total)
Total hours: 30 hours Credit units: 2 units
27. Course administrator's name (mention all, if more than one name)
Asst. Lecturer Humam Ali Sabih humam.a.sabeeh@ gu.edu. iq
28. Course Objectives
1-To introduce students to human rights, highlighting their main characteristics, sources, and the historical stages through which human rights have developed. 2-To understand how political rights are exercised. 3-To familiarize students with the Universal Declaration of Human Rights, as well as international charters and treaties that enshrine human rights.

29. Teaching and Learning Strategies
Delivering lectures and using the discussion and dialogue method

30. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Knowing the Foundations of Democracy: Sovereignty of the people Freedom of expression and human rights Election of officials in a free and fair manner Respect for law and institutions Recognizing the Importance of Democracy: Promoting political participation Protecting right Achieving justice and equality	Definition of Democracy	Lecture	Question and Answer Sessions and Conducting Examinations
2	2	Understanding the Emergence of Democracy: Democracy evolved from ancient Greek ideas, through the European Middle Ages, to the modern era and representative systems of governance. Knowing the Different Concepts of Democrac	The Emergence of Democracy Different Concepts of Democracy	Lecture	Question and Answer Sessions and Conducting Examinations

3	2	Understanding Popular Sovereignty: The people are the source of authority and decision-making. Freedom and Equality: Protection of individual rights and fundamental freedoms for all citizens. Election of Officials: Leaders are elected in a free and fair manner. Rule of Law: Everyone, rulers and citizens alike, is subject to the law. Accountability and Transparency: Officials are accountable to the people and oversight institutions. Multiparty System and Freedom of Opinion: Encouragement of diverse viewpoints.	Characteristics of a Democratic System	Lecture	Question and Answer Sessions and Conducting Examinations
4	2	Conditions: An aware populace, rights and freedoms, rule of law, peaceful transfer of power. Components: Constitution, effective institutions, freedom of opinion and press, fair elections. Pillars: Popular sovereignty, freedom and equality, rule of law, accountability and transparency.	Conditions, Components, and Pillars of Democracy	Lecture	Question and Answer Sessions and Conducting Examinations
5	2	Understanding the Types of Democracy	Types of Democracy: Democracy in Islam	Lecture	Question and Answer Sessions and Conducting Examinations

6	2	Definition: A system of governance that relies on the decision of the majority in making decisions. Basic Principle: The majority decides, while respecting the fundamental rights of the minority. Objective: To make effective and prompt decisions that represent the will of the majority of the people.	Majority Rule Systems	Lecture	Question and Answer Sessions and Conducting Examinations
7	2	Understanding the Advantages and Disadvantages of Democracy and Knowing Its Types	Advantages and Disadvantages of Democracy	Lecture	Question and Answer Sessions and Conducting Examinations
8	2	Understanding the Shared Principles: Popular sovereignty Freedom and equality Rule of law Accountability and transparency Democratic Systems: Direct Democracy: The people participate directly in decision-making. Representative Democracy: The people elect representatives to make decisions on their behalf	Fundamental Principles Common to Democratic Governance	Lecture	Question and Answer Sessions and Conducting Examinations

9	2	Understanding Civil and Political Rights	Civil and Political Rights	Lecture	Question and Answer Sessions and Conducting Examinations
10	2	Knowing the Types of Rights	Types of Human Rights in International Law	Lecture	Question and Answer Sessions and Conducting Examinations
11	2	Civil and Political Rights: Right to life, liberty, equality, and political participation. Economic, Social, and Cultural Rights: Right to education, health, work, and an adequate standard of living. Collective Environmental Rights: Right to development, environmental protection, and the rights of indigenous peoples.	Types of Human Rights in International Law	Lecture	Question and Answer Sessions and Conducting Examinations
12	2	Understanding the Universal Declaration of Human Rights (UDHR)	The Universal Declaration of Human Rights (UDHR)	Lecture	Question and Answer Sessions and Conducting Examinations
13	2	Understanding that rights and values vary according to religion and culture. Some religions place greater emphasis on individual rights, while others focus on the rights of the community and society.	Differences in Rights Across Religions	Lecture	

		Recognizing that principles of justice and equality may differ between religions, but fundamental human values are shared.			
14	2	Women's Rights: Equality, access to education, employment opportunities, political participation, and protection from violence and discrimination. Children's Rights: Right to life, health, education, protection from exploitation and abuse, and participation in age-appropriate decision-making. Recognizing the importance of protecting these rights to ensure justice, equality, and sustainable developmen	Women's and Children's Rights	Lecture	Question and Answer Sessions and Conducting Examinations
15	2	Sharia: Protects women's rights in marriage, inheritance, alimony, protection from injustice, and participation in family and social affairs. Civil Law / State Law: Promotes equality in education, employment, and politics, and ensures protection of women	Women's Rights in Sharia and Law	Lecture	Question and Answer Sessions and Conducting Examinations

		from violence and discrimination. Understanding the Complementarity and Differences Between Sharia and Civil Law			

31. Course Evaluation
Midterm Examination: 30 marks Final Examination: 70 marks

32. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1) الأنظمة السياسية تأليف حميد حنون, الديمقراطية من الاغريق الى عالم ما بعد الحداثة تأليف هاشم الميلاني 2) حقوق الانسان والطفل الديمقراطية للدكتور ماهر صالح
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

4-Course Name:
Biostatistics
33. Course Code:
34. Semester / Year:
First semester, first stage, ٢٠٢٥-٢٠٢٦
35. Description Preparation Date:
1-2-2026
36. Available Attendance Forms:
attendance
37. Number of Credit Hours (Total) / Number of Units (Total)
Total Hours: 30 hours Total Credit Units: 2 units
38. Course administrator's name (mention all, if more than one name)
Asst. Lecturer Tabarak Yahya Abd tabarak.abd2101m@coadec.uobaghdad.edu.iq
39. Course Objectives
1) Enable students to apply mathematical statistics in pharmaceutical science. 2) Use biostatistics in specific pharmaceutical courses, calculate the odds ratio a relative risk of an event 3) Estimate statistical population indicators, and develop alternative hypotheses.
40. Teaching and Learning Strategies

Using the smart board

Using presentation slides

Requiring periodic reports

41. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
٢-١	٤	Understand the fundamentals of biostatistics and descriptive statistics. Collect, organize, and summarize health-related data. Interpret statistical results in medical and health sciences.	Fundamentals of biostatistics and descriptive statistics	Smart Board	Quizzes, Reports, and Homework Assignments
٤-٣	٤	Understand the concepts of integration and differentiation. Apply rules of integration and differentiation to problem solving. Use calculus in scientific applications.	Integration and differentiation	Smart Board	Quizzes, Reports, and Homework Assignments
٦-٥	٤	Explain the concept of the area under the curve. Compute areas using definite integrals. Apply area-under-the-curve analysis in	Applications of the area under the curve	Smart Board	Quizzes, Reports, and Homework Assignments

		scientific applications.			
٨-٧	٣	Understand the concepts of samples and confidence intervals. Calculate and interpret confidence intervals. Apply sampling concepts in statistical analysis.	Samples and confidence intervals	Smart Board	Quizzes, Reports, and Homework Assignments
٩	٣	Understand dependent and independent variables. Distinguish the role of each variable in experiments and studies. Use variables for data analysis and result interpretation.	Dependent and independent variables	Smart Board	Quizzes, Reports, and Homework Assignments
١٠- ١١	٣	Understand the concepts of correlation and regression. Calculate and interpret correlation and regression coefficients. Apply correlation and regression for data analysis and prediction.	Correlation and regression	Smart Board	Quizzes, Reports, and Homework Assignments
١٢	٣	Understand one-sample and two-sample tests. Compare data using appropriate statistical tests.	One-sample tests and Two-sample tests	Smart Board	Quizzes, Reports, and Homework Assignments

		Interpret test results to determine differences or relationships.			
١٣	٢	Understand the concept of Analysis of Variance (ANOVA) tests. Apply ANOVA to compare means across multiple groups. Interpret ANOVA results to identify statistically significant differences between groups.	Analysis of variance tests	Smart Board	Quizzes, Reports, and Homework Assignments
١٤	٢	Understand non-normal data distributions. Select appropriate statistical tests for non-normal data. Apply statistical analysis to non-normal datasets.	Choices in the domain of non-normal distribution	Smart Board	Quizzes, Reports, and Homework Assignments
١٥	٢	Understand correlation tests for categorical variables. Identify relationships between categorical variables. Apply statistical tests to categorical data.	Correlation test for categorical variables	Smart Board	Quizzes, Reports, and Homework Assignments

42. Course Evaluation

Preparation of Periodic Reports

Conducting Oral and Written Examinations

Classroom Discussions Through Questions That Encourage Linking the Material with Other Subjects Assessment: 30 marks for the Midterm Examination + 70 marks for the Final Examination	
43. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	**1)** Introductory Biostatistics for the Hea Sciences, by Michael R. Chernick **1)** *Introductory Statistics* Using *SPSS*, Secc Edition, by *Herschel Knapp*.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

5- Course Name:
Medical physics
44. Course Code:
45. Semester / Year:
First semester, first stage ,2025−2026
46. Description Preparation Date:
1−2−2026
47. Available Attendance Forms:
attendance
48. Number of Credit Hours (Total) / Number of Units (Total)
Total Hours: ٤٥ hours Total Credit Units: 2 units
49. Course administrator's name (mention all, if more than one name)
Asst. Lecturer: Taha Rashdi taha.rushdi@gu.edu.iq
50. Course Objectives

1) Gives students the ability to deal with the concepts of physics, emphasizes the knowledge and skills required to efficiently discharge the duties and responsibilities of the pharmacist.

2) students will be able to understand the physical terminology and abbreviation used to describe the lecture, and the application in medical field.

51. Teaching and Learning Strategies

Using the smart board

Using presentation slides

Requiring periodic reports

52. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	٢	Understand general concepts of physics methods and standards. Identify thermodynamic systems and their properties. Apply the principle of energy conservation.	General concepts: Method of physics and standards; thermodynamics system and system properties; conservation of energy principle	lectures using PowerPoint	Quizzes, midterm exams, and final exams.
٢	٢	Understand pressure, temperature, and their scales (Celsius, Fahrenheit, Kelvin). Learn the equation of state for gases. Distinguish between ideal and real gases.	Pressure; temperature and temperature scales (Celsius, Fahrenheit,Kelvin); equation of state; ideal gas and real gas; general law of gases.	lectures using PowerPoint	Quizzes, midterm exams, and final exams.

		Apply the general gas law.			
٣	٢	Understand heat and energy. Learn work and mechanical forms of work. Understand power. Apply the first law of thermodynamics. Study Boyle's and Charles' laws of gases.	Heat and energy; work and mechanical forms of work; power; the 1st law of thermodynamics; Boyles and Charles law	lectures using PowerPoint	Quizzes, midterm exams, and final exams.
٤	٢	Identify devices for blood glucose monitoring. Understand parenteral infusion devices. Study cardiac output measurement devices.	Medical Devices for: Blood Glucose Monitoring ,Parenteral Infusion Devices , Cardiac Output Measurement	lectures using PowerPoint	Quizzes, midterm exams, and final exams.
٥	١	Identify implantable cardiac pacemakers. Understand their basic mechanism and functions.	Implantable Cardiac Pacemakers	lectures using PowerPoint	Quizzes, midterm exams, and final exams.

		Recognize their use in treating cardiac rhythm disorders.			
٦	١	Identify the electrocardiogram (ECG). Understand the basics of recording the heart's electrical activity. Interpret basic ECG results.	Electrocardiogram ECG	lectures using PowerPoint	Quizzes, midterm exams, and final exams.
٧	١	Identify the electroencephalography (EEG). Understand the basics of recording the brain's electrical activity. Interpret basic EEG patterns.	Electroencephalography EEG	lectures using PowerPoint	Quizzes, midterm exams, and final exams.
٨	١	Understand Kirchoff's, Planck's, Stefan–Boltzmann, and Wien's laws. Learn about black body and albedo. Study heat transfer methods: radiation,	Radiation: Kirshoffs law; planks law; Stefan-Boltzman law; Wiens law; Black body and Albedo; Heat transfer (radiation, convection, conduction).	lectures using PowerPoint	Quizzes, midterm exams, and final exams.

		convection, and conduction.			
٩	٢	Identify X-rays and their spectra, and understand X-ray absorption. Understand the effects of ultraviolet (UV) and infrared (IR) radiation. Study the medical and biological effects of radiation.	X-Ray and X-Ray spectra; absorption of X-Ray; U.V and IR effects; medical and biological effects of radiation;	lectures using PowerPoint	Quizzes, midterm exams, and final exams.
١٠	١	ntroduction to Radiotherapy. Understanding the use of Radioactive Iodine in medicine. Studying the medical and therapeutic applications of radiation.	Radiotherapy, radioactive iodine	lectures using PowerPoint	Quizzes, midterm exams, and final exams.
١١	١	Understand the principle of MRI. Recognize medical diagnostic uses of MRI. Be able to differentiate images from different MRI techniques.	Magnetic Resonance Imaging MRI	lectures using PowerPoint	Quizzes, midterm exams, and final exams.

١٢	١	Understand the principle of CT imaging. Recognize clinical applications of CT scans. Interpret basic CT images.	Computed Tomography CT scan	lectures using PowerPoint	Quizzes, midterm exams, and final exams.
١٣	١	Understand the principle of diffusion. Recognize flow and viscosity properties (rheology). Apply concepts in pharmaceutical systems and materials.	Diffusion and rheology	lectures using PowerPoint	Quizzes, midterm exams, and final exams.

53. Course structure (practical)

Course description (practical)		
Weeks	Laboratory sessions & *Clinical requirements*	hours
1	Guidelines of Medical Physics Lab and Rules must be obeyed by the students	2
2	Graphing Techniques	2
3 4	Ohm's law: - verify ohm's law - to find the value of different values of resistance 2 4	2
5 6	Semiconductors (junction diode): To determine the characteristics of the semiconductors Comparison between omic and non-omic resistance	2
7 8	The focal length of convex lens: -Rough value of focal length of different convex lenses, -A graphical method of measuring of focal length, Comparison between these methods and the given value.	2
9 10	Hook's law: -To verify Hook's law and determine the force constant of the spring. -To determine the work done by stretching the spring	2

11 12	Focal length of concave mirror: -Locating the radius of curvature -Dete	2
13 14	Laser applications: -To measure the width of a single slit by using a laser -To measure the wavelength of laser by using a certain single slit	2
15	Boyle's law: -To verify Boyle's law -To measure the pressure of the atmosphere	2

1. Course Evaluation
Preparing periodic reports. Conducting oral and written tests. Class discussions through questions that encourage linking the material with other subjects. 20 marks practical + 20 marks theoretical (annual effort). Final exam + 60 marks.

1. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Physics for Biology and Medical Studer 2nd ed. 2) Medical Instruments and Device principles and practices: Schreiner, Steven CRC Press, 2015.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	

Electronic References, Websites	

Course Description Form

6-Course Name:
Arabic Language
2. Course Code:
3. Semester / Year:
Second Semester – First stage – 2025–2026
4. Description Preparation Date:
٢٠٢٦-٢-١
5. Available Attendance Forms:
full attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
Total hours: 30 hours Total credits: 2 credits
7. Course administrator's name (mention all, if more than one name)
Asst. Lecturer Abdulhussein Ali Abdulhussein

abdulhussein.ali@gu.edu.iq

8. Course Objectives

1-Enable students to learn sentence construction skills and understand how incorrect sentences aff meaning.

2-Enable students to prepare scientific reports in Arabic.

9. Teaching and Learning Strategies

Using the smart board.

Using presentation slides (PowerPoint).

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	تعريف اللغة العربية: التعرف على اللغة العربية كلغة سامية ذات أهمية ثقافية وتاريخية كبيرة. أهمية اللغة العربية: فهم دورها في التواصل، العلم، الأدب، والدين. مكونات اللغة: التعرف على الحروف، الكلمات، الجملة، والنحو والصرف. تنمية المهارات اللغوية: القدرة على القراءة، الكتابة، الاستماع، والتحدث بشكل صحيح. الوعي بالثقافة العربية: تقدير التراث الأدبي	مقدمة عن اللغة العربية	lectures	• Short quizzes • Term exam • Final exam

٢	٢	التعرف على الجملة الفعلية: تبدأ بالفعل، ويكتمل معناها بالفاعل والمفعول أحيانًا. تحديد عناصرها: فعل، فاعل، ومفعول به عند الحاجة. استخدامها: القدرة على صياغة جمل فعلية صحيحة وواضحة.	الجملة الفعلية	lectures	
3	2	تعريفها: تبدأ باسم وتفيد الخبر عن المبتدأ. عناصرها: مبتدأ وخبر. الاستخدام: تكوين جمل اسمية صحيحة وواضحة	الجملة الاسمية	lectures	• Short quizzes • Term exam • Final exam
٤	٢	فهم المبتدا والخبر وقواعدها	المبتدا والخبر	lectures	
5	2	فهم ان واخواتها وقواعدها	ان واخواتها	lectures	• Short quizzes • Term exam • Final exam
٦	٢	فهم كان واخواتها وقواعدها	كان واخواتها	lectures	
7	2	فهم قواعد الفاعل ونائب الفاعل	قواعد الفاعل ونائب الفاعل	lectures	• Short quizzes • Term exam • Final exam

٨	٢	التعرف على أنواع الهمزة: همزة الوصل وهمزة القطع. مواضع الكتابة: أول الكلمة، وسطها، آخرها. طريقة الرسم: حسب موقعها والحركة: على الألف، الياء، أو السطر	قواعد ر سم الهمزة	lectures	
9	2	فهم المفعول به والمفعول المطلق وقواعدها	المفعول بة والمفعول المطلق	lectures	• Short quizzes • Term exam • Final exam
١٠	٢		امرو القيس تحليل نص شعر ي	lectures	
11	2		بدر شاكر السياب :تحليل نص شعر ي	lectures	• Short quizzes • Term exam • Final exam
١٢	٢		محمد الجواهري : :تحليل نص شعري	lectures	
13	2		أبو الطيب المتنبي :تحليل نص شعري	lectures	• Short quizzes • Term exam • Final exam

١٤	٢		عمرو بن كلثوم:تحليل نص شعري	lectures	
15	2		لبيد بن ربيعة :تحليل نص شعري	lectures	• Short quizzes • Term exam • Final exam
11. Course structure (practical)					

1. Course Evaluation
Annual assessment: 30 marks Final exam: 70 marks

2. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	**١) كتاب العربية الجامعية لغير المتخصصين تأليف د.عبد الراجحي** **٢) كتاب اللغة العربية للأقسام غير الاختصاص تأليف الدكتور محيي هلال** **٣) شرح أبن عقيل الجزء الأول**
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

7- Course Name:
Physiology I
2. Course Code:
3. Semester / Year:
Second semester, first stage٢٠٢٦–٢٠٢٥
4. Description Preparation Date:
٢٠٢٦–٢–١
5. Available Attendance Forms:
attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
Total hours: 75 hours Total credits: 4 credits
7. Course administrator's name (mention all, if more than one name)

م.د. محمد محسن شلال

Mohammed.Mohsin@gu.edu.iq

م.م. الاء محسن علي

alaa.mohsen@gu.edu.iq

8. Course Objectives

Enable the student to understand the physiology and function of the cell.

Enable the student to understand body physiology and the functions of different organs.

Provide a complete description of the physiology of the various body systems.

9. Teaching and Learning Strategies

Lectures

Conducting practical experiments

Reading textbooks

Engaging in scientific discussions

Performing laboratory experiments

Reading textbooks (repeated for emphasis)

Using Data Show / projector

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	information about Cell composition	**The general and cellular basis of medical physiology**	Lectures	Oral tests + homework
2-3	6	Body cells and Cell membrane, Ion channels	Physiology of nerves and muscles: Nerve cells; excitation and conduction;	Lectures	Oral tests + homework

			Properties of mixed nerves; glia; neurotrophins; Nerve fiber types and functions; Muscles: Skeletal muscle; smooth .muscle; cardiac muscle Synaptic transmission: Reflexes; cutaneous, deep and visceral ;sensations alert behavior, sleep and electrical activity of the brain; control of posture and movement; higher function of the nervous system; central regulation of visceral function; the autonomic nervous system		
4-5	٦	**Properties of mixed nerves; glia; neurotrophins**	Respiration: Respiratory zones; Mechanics of ;respiration; air volumes respiratory muscles; compliance of the lungs and chest wall; ;surfactants differences in ventilation and blood flow in deferent parts of the lung; Dead space and uneven ventilation; Pulmonary circulation: Pressure, volume and flow. Gas transport between the lungs and tissue; Regulation of respiration: Neural control of breathing; Respiratory centers; Regulation of respiratory activity: Chemical factors; non ;chemical factors Respiratory adjustment in health and disease; Effect of exercise; ;Hypoxia Emphysema; Asthma	Lectures	Oral tests + homework

٧-٦	6	**Nerve functions** Graded potentials, action potential	Renal Physiology: Introduction; innervations of the renal vessels; renal clearance; renal blood flow; glomerular :filtration rate (GFR) Measurements; factor affecting GFR; Filtration fraction; reabsorption of +Na Cl – and glucose. , Tubuloglomerular feedback and glomerulotubular balance; water excretion in: proximal tubules; loop of henle; distal ;tubules collecting ducts; the counter current mechanism; role of urea; water diuresis and osmotic diuresis; acidification of ;the urine: H+ secretion reaction with buffers; ammonia secretion; factors affecting acid ;secretion bicarbonate execration; +regulation of Na – K+ and Cl , ;excretion; uremia acidosis; micturition	Lectures	Oral tests + homework
١٠-٩-٨	٩	**Smooth muscle; cardiac muscle**	Cardiovascular system: origin and spread of cardiac excitation; the electrocardiogram; cardiac arrhythmias; electrographic findings in cardiac diseases; mechanical events of the cardiac cycle; cardiac ;output cardiovascular regulatory mechanisms: Local ;regulatory mechanisms systemic regulation by the nervous system; systemic regulation by	Lectures	Oral tests + homework

			hormones; Coronary circulation; Hypertension; Heart failure; Angina pectoris		

11. Course structure (practical)

Course description (practical)		
Weeks	Laboratory sessions & *Clinical requirements*	hours
1	Experiments on respiratory system (respiratory rate and volumes(	2
2	Introduction to blood physiology	2
3	Blood typing and blood transfusion	2
4	Tutorial	2
5	Packed cell volume	2
6	Determination of hemoglobin concentration	2
7	Blood indecies Mid exam	2
8	Determination of bleeding time and clotting time	2
9	Determination of hemoglobin concentration	2
10	Blood indecies	2
11	Effect of exercise on blood pressure	2
12	Electrocardiogram (ECG)	2
13	Tutorial and review	2
١٤-١٥	Determination of hemoglobin concentration	٤

1. Course Evaluation

Theory 20% + Practical 20%

Annual assessment 40%

Final exam 60%

3. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Textbook of Medical Physiology by Guyton AC; latest edition. Review of Medical Physiology; Ganong W.F (Ed.), Latest edition.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	1. Vander Human Physiology: The Mechanisms of body function. Latest edition. 2. Review of Medical Physiology by Ganong W.F. Latest edition
Electronic References, Websites	

Course Description Form

2. Course Name:
medical terminology
3. Course Code:
4. Semester / Year:
First Semester – First Stage – 2025–2026
5. Description Preparation Date:
1–2–2026
6. Available Attendance Forms:
Attendance

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

Total hours: ١٥ hours

Total credits: 1 credit

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

Assistant Lecturer: Qasim Khalid

Email: Qasim.khalid@gau.edu.iq

9. Course Objectives

Course Objectives

Recognize and understand basic medical terms.

Identify medical abbreviations and decode them.

Spell and pronounce basic medical terms correctly.

Analyze unfamiliar terms using knowledge of word roots, prefixes, and suffixes.

10. Teaching and Learning Strategies

Lectures and interactive presentations

Self-learning and research projects

Workshops and interactive seminars

11. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	1	Understanding the basics of medical terminology	Basic word roots and common suffixes	Lectures	quizzes and homework
٣-٢	٢	Understanding the basics of medical terminology	More word roots, suffixes and prefixes related to pharmaceutical sciences (pharmacognosy, clinical pharmacy, pharmaceutics	Lectures	quizzes and homework
٤	١	Understanding the basics of medical terminology	Basic anatomical terms and abnormal conditions	Lectures	quizzes and homework
٥	١	Understanding the basics of medical terminology	The genitals and urinary tract	Lectures	quizzes and homework
٦	١	Understanding the basics of medical terminology	The gastrointestinal tract	Lectures	quizzes and homework
٧	١	Understanding the basics of medical terminology	The heart and cardiovascular system	Lectures	quizzes and homework
٨	١	Understanding the basics of medical terminology	Symptoms, diagnoses, treatments, communication qualifiers, and statistics	Lectures	quizzes and homework
٩	١	Understanding the basics of medical terminology	Growth and development, and body orientation	Lectures	quizzes and homework
١٠	١	Understanding the basics of medical terminology	Gynecology, pregnancy, and childbirth	Lectures	quizzes and homework
١١	١	Understanding the basics of medical terminology	The eye and the respiratory tract	Lectures	quizzes and homework
١٢	١	Understanding the basics of medical terminology	The nervous system and	Lectures	quizzes and homework

			behavioral disorders		
١٣	١	Understanding the basics of medical terminology	The nervous system and behavioral disorders	Lectures	quizzes and homework
١٤	١	Understanding the basics of medical terminology	Blood	Lectures	quizzes and homework
١٥	١	Understanding the basics of medical terminology	immunity	Lectures	quizzes and homework

12. Course Evaluation

30 marks for the midterm exam + 70 marks for the final exam Total: 100 marks

13. Learning and Teaching Resources

Required textbooks (curricular books any)	Medical Terminology: A Living Language (4th Edition) - Softcover Fremgen, Bonnie F.; Frucht, Suzanne S . Collins CE., A Short course in Medical Terminology. 3rd edit 2014. Lipincott Williams and Wilkins
Main references (sources)	edical Terminology For Dummies: 3rd Edition By Beverley Henderso CMT-R, HRT Jennifer L. Dorsey With: Randye Kaye Publisher Tantor Audio
Recommended books and references (scientific journals, reports…)	Quick & Easy Medical Terminology A Paperback edition by Peggy C. Leonard in English (2 Nov 2023

Course Description Form

14. Course Name:
organic Chemistry I
15. Course Code:
16. Semester / Year:
Second Semester – First Stage– 2025-2026
17. Description Preparation Date:
1-2-2026
18. Available Attendance Forms:
Attendance
19. Number of Credit Hours (Total) / Number of Units (Total)

Total hours: 75 hours
Total credits: 4 credits

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

Name: Dr. Aseel Salah Mansour

Email: dr.aseel.salah21@gmail.com

Pharmacist Zahraa Amer Abdulameer

21. Course Objectives

To teach students the principles and fundamentals of organic chemistry, which include types of hydrocarbon compounds such as alkanes, alkenes, alkynes, cyclic alkanes, alkyl halides, alcohols, ethers, and stereochemistry. This includes studying the properties of these compounds, their pharmaceutical importance, methods of preparation, and their subsequent reactions.

22. Teaching and Learning Strategies

1-**Knowledge and fundamental principles of organic chemistry**
2-**Conducting practical experiments related to theoretical concepts**
3-**Reading textbooks**
4- **Engaging in scientific discussions**

23. Course Structure (theoretical and practical)

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	3	Introduction (Structure and properties: Atomic and molecular orbitals, Hybrid orbitals, Intermolecular forces, Polarity, Structure and physical properties))		Lecture	Quiz

2.	2	Alkanes.	Lecture	Quiz
3.	2	methane.		
4.	4	Alkenes	Lecture	Quiz
5.	3	dienes.	Lecture	Quiz
6.	3	Alkynes		
7.	3	Cycloalkanes.	Lecture	Quiz
8.	3	Cycloalkanes.		
9.	3	Stereochemistry I & II	Lecture	Quiz
10.	3	Alkyl halides.	Lecture	Quiz
11.	3	Alcohols	Lecture	Quiz
12.	3	Aromatic Hydrocarbons (includes benzene, electrophilic aromatic substitution, arenas and their derivatives).	Lecture	Quiz
13.		Aromatic Hydrocarbons (includes benzene, electrophilic aromatic substitution, arenas and their derivatives).	Lecture	
14.	3	Phenols.	Lecture	Quiz
15.	3	ethers.	Lecture	Quiz

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1.	٢	Understand the rules and guidelines of laboratory safety. Identify chemical and physical hazards and ways to prevent them. Adhere to safety procedures during laboratory work.	Laboratory Safety	lab	
2.	٢	To learn the basic principles of organic chemistry. To know the types of laboratory glassware and their uses.	Introduction to Organic Chemistry and Laboratory Glassware	lab	Quiz
3.	2	Understand the principle of melting point determination. Ability to determine the melting point of a known sample. Use the melting point to evaluate the purity of a substance.	Determination of melting point (Known sample).	lab	Quiz
4.	2	Understand the principle of melting point determination. Ability to determine the melting point of an unknown sample. Use the results to identify the substance and evaluate its purity.	Determination of melting point (quiz and unknown).	lab	Quiz
5.	2	Understand the principle of boiling point measurement. Ability to determine the boiling point of a known sample. Use the boiling point to evaluate the identity and purity of a substance.	Determination of boiling point (known sample).	lab	Quiz

6.	2	Understand the principle of boiling point measurement. Ability to determine the boiling point of an unknown sample. Use the results to identify the substance and assess its purity.	Determination of boiling point (quiz and unknown).	lab	Quiz
7.	2	Understand the principle of recrystallization. Ability to purify a known sample using recrystallization. Assess the purity of the substance after purification.	Re-crystallization (known sample).	lab	Quiz
8.	2	Understand the principle of recrystallization. Ability to purify an unknown sample using recrystallization. Use the results to identify the substance and assess its purity.	Re-crystallization (quiz and unknown sample).	lab	Quiz
9.	2	Understand the principle of distillation techniques. Ability to separate known samples using distillation. Use distillation to assess the purity of substances and separate them.	Distillation techniques (known samples).	lab	Quiz
10.	2	Understand the principle of distillation techniques. Ability to separate an unknown sample using distillation. Use the results to identify the substance and assess its purity.	Distillation techniques (quiz and unknown).	lab	Quiz

11.	2	Understand the concept of solubility and classify substances according to their solubility. Ability to determine the solubility category of a known sample. Use the results to evaluate the chemical properties of the substance.	Determination of solubility class (known sample).	lab	Quiz
12.	2	Understand the concept of solubility and classify substances according to their solubility. Ability to determine the solubility category of an unknown sample. Use the results to identify the substance and evaluate its chemical properties.	Determination of solubility class (quiz and unknown).	lab	Quiz
13–14	4	Understand the basic principles of chemical analysis. Ability to determine the components of simple samples. Apply the concepts in practical material analysis.	Elementary Analysis	lab	Quiz
15	٢	Understand the principle of sodium reaction with organic compounds. Ability to detect the presence of elements (N, S, Halogens) in a sample. Apply the techniques to obtain information about the chemical structure of the substance.	Sodium Fusion	lab	

11. Course Evaluation	
20 marks for midterm exams, 20 marks for practical, and 60 marks for final exams.	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any	R.T. Morrison, R.N. Boyd and S.K. Bhattacharjee "Organic Chemistry" 7th Edition Pearson Education Inc. (2011).
Main references (sources)	John McMurry "Organic Chemistry" 9th Edition Cengage Learning, USA (2016).
Recommended books and references (scientific journals, reports...)	John McMurry "Organic Chemistry with Biological Applications" 3rd Edition Cengage Learning, USA (2015).
Electronic References, Websites	Google searching for organic chemistry

Course Description Form

24. Course Name:
Pharmaceutical calculation
25. Course Code:
26. Semester / Year:
Second Semester – First Stage – 2025-2026
27. Description Preparation Date:

٢٠٢٦-٢-١
28. Available Attendance Forms:
Attendance
29. Number of Credit Hours (Total) / Number of Units (Total)
Total hours: 75 hours Total units: 4 units
30. Course administrator's name (mention all, if more than one name)
Dr. Ahmed Yaseen Al-Shar'ah Email: Ahmed.yaseen.alsharea@gau.edu.iq
31. Course Objectives
1. Develop skills to accurately and safely interpret prescriptions and medication orders. 2. Apply all types of measurement systems in pharmaceutical calculations, including determining dosag according to different patient needs. 3. Perform formula adjustment calculations, including methods of reduction and enlargement. 4. Calculate concentration percentages, ratios, density, and specific/relative weight or volume for variou pharmaceutical preparations. 5. Prepare and evaluate isotonic solutions to ensure compatibility with physiological systems. 6. Calculate values related to electrolyte solutions, including milliequivalents, millimoles, and milliosmole 7. Apply the principles of preparing intravenous solution mixtures and calculate the flow rate for IV thera
32. Teaching and Learning Strategies

Use of the smart board

Use of presentation slides

Requirement for periodic reports

1. Course Structure (theoretical)

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
١	٣	Learning how interpret prescriptions medication orders	Interpretation of prescription or medication orders	smart boa	Interactive questions and discussions
٢	٣	Learn differ measurement systems and th units, and ap related calculations	Systems of measurement	smart boa	Interactive questions a discussions

٤-٣	٣	The student lea how to calcul density, spec gravity, and spec volume.	Density, specific gravity and specific volume	smart boa	Interactive questions discussions
٦-٥	٦	Define solution concentration and explain its importance in medical and pharmaceutical fiel Explain the concep percent strength. Calculate percentag concentration usin the appropriate formulas for each type. Define ratio strengt Convert betwe percent strength a ratio strength, a vice versa.	Percent strength, ratio strength, and other expressions of concentration	smart boa	Interactive questions discussions
٨-٧	٦	Define drug dosa recognize the types dosages, and calcul drug dosages bas on the patie	Calculation of doses, calculation of doses patient parameters	smart boa	Interactive questions discussions

		weight and bo surface area.			
٩	٣	Define the concept reducing and enlarging pharmaceutical formulas and expla its importance in pharmaceutical compounding. Explain when and why formula reduction or enlargement is needed based on th required quantity. Identify the origina (master) formula a the quantity to be prepared. Accurately calculat the reduction or enlargement factor Apply the calculate factor to all components of the formula. Maintain the correc proportions among components after modification. Use correct units when performing calculations.	Reducing and enlarging formulas	smart boa	Interactive questions discussions

		Detect and correct calculation errors during formula adjustment. Solve practical problems related to reducing and enlarging pharmaceutical formulas. Apply the concept practical pharmaceutical preparations.			
١٠	٣	Define the concept altering product strength and explai its importance in pharmaceutical practice. Explain methods of altering product strength, such as: Dilution Concentration Calculate the final strength of a preparation after dilution or concentration. Define stock solutic and explain their uses.	Altering product strength, use of stock solutions, and problem solving by alligation	smart boa	Interactive questions discussions

		Calculate the requi amount of a stock solution to prepare specific concentration. Prepare a product with a specified concentration using stock solutions correctly. Explain the princip of the alligation method and its mathematical basis Use the alligat method to so problems involv mixing solutions different concentrations.			
١١	٦	Understand the concept of isotonic solutions and their effects on cells. Distinguish betwee different types of osmotic tonicity. Adjust the osmotic tonicity of pharmaceutical solutions. Understand the rol of buffer solutions i stabilizing pH.	Altering product strength, use of stock solutions, and problem solving by alligation Isotonic and buffer solutions	smart boa	Interactive questions discussions

		Apply these conce in ba pharmaceutical preparations.			
١٣-١٢	٦	Understand the concept of electroly solutions. Distinguish betwee mEq, mmol, and mOsm. Calculate electrolyt concentrations usir different units. Relate charge and concentration to osmotic effects. Apply the calculati in simple medical a pharmaceutical problems.	Electrolyte solutions (milliequivalents, millimoles and milliosmoles)		Interactive questions discussions
١٥-١٤	٦	Understand the bas of parenteral administration and injections. Recognize the preparation and mixing of intravenc solutions (admixtures). Accurately calculat the rate of flow.	Electrolyte solutions (milliequivalents, millimoles and milliosmoles)	smart boa	

		Choose the appropriate metho for intravenous administration. Apply the calculati in simple clini cases.			

2. Course description (practical)

week	hours	Unit name	Learning method	Evaluation
١	٢	Demonstration of different glass ware and equipment used in the field of pharmacy	Use of the smart board, conducting experiments, and solving mathematical problems	Discussions and practical results evaluation
٢	٤	Pharmaceutical measurements	Use of the smart board, conducting experiments, and solving mathematical problems	Discussions and practical results evaluation
٣	٤	Volume measurements.	Use of the smart board, conducting experiments, and solving mathematical problems	Discussions and practical results evaluation
٤	٤	Calculations involving liquid pharmaceutical preparations.	Use of the smart board, conducting experiments, and solving mathematical problems	Discussions and practical results evaluation
٥	٤	Calculations involving buffer and isotonic liquid preparations	Use of the smart board, conducting experiments, and solving	Discussions and practical results evaluation

			mathematical problems	
٦	٤	Reducing and enlarging prescription contents.	Use of the smart board, conducting experiments, and solving mathematical problems	Discussions and practical results evaluation
7	٤	**Percentages in calculating prescription contents.**	Use of the smart board, conducting experiments, and solving mathematical problems	Discussions and practical results evaluation
8	٤	Stock solutions and dilution technique during dispensing technique.	Use of the smart board, conducting experiments, and solving mathematical problems	Discussions and practical results evaluation

3. Course Evaluation

Practical: 20 marks + 20 marks for the midterm exam

Annual coursework: 40 marks

Final exam: 60 marks

4. Learning and Teaching Resources

Required textbooks (curricular books, any)	1) Pharmaceutical Calculations; 15th edition (2017) by Howard Ansel
Main references (sources)	

Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Computer Science
2. Course Code:
3. Semester / Year:
Second Semester – First Stage – 2025-2026
4. Description Preparation Date:

٢٠٢٦-٢-١
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
Total hours: 45 hours Total units: 2 units
7. Course administrator's name (mention all, if more than one name)
Assistant Lecturer Janat Tareq Fannous jannat.tariq@gu.edu.iq
8. Course Objectives 1) Provide a thorough overview of the fundamental concepts of computer applications. 2) The course covers the use of Microsoft Word, Microsoft Power point, and Google applications in detail.
9. Teaching and Learning Strategies

Strategy	Teaching Strategies: 1. *Demonstrations and Tutorials:* - Provide step-by-step demonstrations of PowerPoint features and functionalities. - Offer tutorials to guide users through creating various types of presentation 2. *Hands-on Practice:* - Allow users to practice creating presentations independently. - Provide exercises and assignments to reinforce learning. 3. *Feedback and Evaluation:* - Offer constructive feedback on presentations created by users.

	- Evaluate presentations based on criteria such as content clarity, visual desig and delivery skills. 4. *Case Studies and Examples:* - Present case studies and examples of effective PowerPoint presentations. - Analyze successful presentations to identify best practices and techniques. Learning Strategies: 1. *Active Engagement:* - Encourage active participation in learning activities and discussions. - Prompt users to explore different features of PowerPoint through experimentation. 2. *Self-paced Learning:* - Provide resources such as tutorials, guides, and online courses for self-pace learning. - Encourage users to explore advanced features of PowerPoint based on their interests and needs. 3. *Collaborative Learning:* - Facilitate group projects where users collaborate to create presentations. - Foster peer learning through sharing tips, feedback, and experiences with PowerPoint. 4. *Continuous Improvement:*

	- Encourage users to seek feedback and continuously refine their presentatio skills. - Provide opportunities for users to highlight their presentations and rece constructive criticism.

10. Course Structure(Theoretical and Practical)

No.	Lesson Subject	Hours
1	Introduction to Microsoft Word (File and Home Tab)	1
2	Insert tab	1
3	Layout Tab	1
4	References Tab	1
5	Mailings Tab	1
6	Review Tab	1
7-8	View Tab	2
9	Introduction to Microsoft PowerPoint	1
10	File and Home Tab	1
11	Insert tab	1
12	Design	1
13	Transition Tab, Slide View	1
14 and 15	Animation Tab , Review Tab , View Tab	2

11. Course Evaluation

Annual coursework: 40 marks Final examination: 60 marks Total marks: 100	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1) Provide a thorough overview of the fundamental concepts of computer applications. 2) The course covers the use of Microsoft Word, Microsoft Power point, and Google applications in detail.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

5. Course Name:
Organic chemistry II
6. Course Code:
7. Semester / Year:
First Semester – Second Stage – 2025-2026
8. Description Preparation Date:
٢٠٢٦-٢-١
9. Available Attendance Forms:

Attendance

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

Total hours: 75 hours

Total units: 4 units

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

Dr. Aseel Salah Mansour

Email: dr.aseel.salah21@gmail.com

Pharmacist: Zahraa Amer Abdul Ameer

12. Course Objectives

A- Cognitive Objectives

A1: To become familiar with the concept of pharmaceutical chemistry in general and organic chemis in particular.

A2: To be able to identify aromatic organic compounds and distinguish them from aliphatic compounds.

A3: To understand the preparation of aromatic compounds, their reactions, and practical applications both

A4: To recognize compounds directly related to their specialization and their practical applications.

A5: To be able to distinguish toxic compounds from non-toxic ones.

B- Skill Objectives of the Course

B1: The student's knowledge of the concept of organic chemistry.

B2: The student's understanding of the basic principles of aromatic organic chemistry.

B3: The student's ability to practice all theoretical and practical applications of organic chemistry.

B4: The student's ability to understand accuracy, precision, and laboratory techniques.

13. Teaching and Learning Strategies

Strategy

Lectures, conducting scientific experiments, and engaging in scientific discussions

14. Course structure (theoretical)

Week	Hours	Unit name	Learning method	Evaluation me
1.	3	Alkyl halides.	Lectures	quiz
2.	3	Stereochemistry II.	Lectures	quiz
3.	3	Stereochemistry II.		
4.	3	Aldehydes and ketones (include also aldol and Claisen condensation); Classification, reactions and properties.	Lectures	quiz
5.	3	Aldehydes and ketones (include also aldol and Claisen condensation); Classification,	Lectures	quiz
6.	3	Aldehydes and ketones, reactions and properties.	Lectures	quiz
7.	3	Carboxylic acids: properties and reactions	Lectures	quiz
٨.	3	Carboxylic acids: properties and reactions	Lectures	quiz
9	3	Carboxylic acids: properties and reactions	Lectures	quiz
10	3	Functional derivatives of carboxylic acids.	Lectures	quiz
11	3	Functional derivatives of carboxylic acids.	Lectures	quiz
12-13	3	Amines I and II.	Lectures	quiz
14-15	3	Phenols.	Lectures	quiz

11. Course Structure (practical)

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	2	Recognize and identify different types of alcohols. Apply chemical tests to confirm the presence of alcohol functional groups. Understand the basic reactions used for alcohol identification.	**Identification of Alcohols**	practical experiments	Various tests
2	2	Identify alcohols in an unknown sample using chemical tests. Apply practical knowledge to accurately interpret the results. Distinguish between different types of alcohols in the unknown sample.	**Identification of Alcohols (quiz unknown)**	practical experiments	Various tests
3	2	Recognize phenols and distinguish them from other compounds. Apply chemical tests to identify the presence of the phenolic hydroxyl group. Understand the basic reactions used for phenol identification.	**Identification of Phenols**	practical experiments	Various tests

4	2	Identify phenols in an unknown sample using chemical tests. Apply practical knowledge to accurately interpret the results. Distinguish between different types of phenols in the unknown sample.	**dentification of Phenols (quiz unknown)**	practical experiments	Various tests
5	2	Recognize aldehydes and ketones and distinguish them from other compounds. Apply chemical tests to identify carbonyl groups. Understand the basic reactions used for aldehyde and ketone identification.	**Identification of Aldehydes and ketones**	practical experiments	Various tests
6	2	Identify aldehydes and ketones in an unknown sample using chemical tests. Apply practical knowledge to accurately interpret the results. Distinguish between different types of aldehydes and ketones in the unknown sample.	**Identification of Aldehydes and ketones (quiz unknown)**	practical experiments	Various tests

7	2	Recognize carboxylic acids and distinguish them from other compounds. Apply chemical tests to identify the carboxyl group. Understand the basic reactions used for carboxylic acid identification.	**Identification of Carboxylic acid**	practical experiments	Various tests
8	2	Identify carboxylic acids in an unknown sample using chemical tests. Apply practical knowledge to accurately interpret the results. Distinguish between different types of carboxylic acids in the unknown sample.	**Identification of Carboxylic acid (quiz unknown)**	practical experiments	Various tests
9	2	Recognize amines and distinguish them from other compounds. Apply chemical tests to identify the amino group. Understand the basic reactions used for amine identification.	**Identification of Amines**	practical experiments	Various tests

10	2	Identify amines in an unknown sample using chemical tests. Apply practical knowledge to accurately interpret the results. Distinguish between different types of amines in the unknown sample.	**Identification of Amines (quiz unknown)**	practical experiments	Various tests
11	2	Recognize salts of carboxylic acids and distinguish them from other compounds. Apply chemical tests to identify the presence of carboxylate groups. Understand the basic reactions used for the identification of carboxylic acid salts.	**Identification of Salt of carboxylic acid**	practical experiments	Various tests
١٢	٢	Identify salts of carboxylic acids in an unknown sample using chemical tests. Apply practical knowledge to accurately interpret the results. Distinguish between different types of carboxylic acid salts in the unknown sample.	**Identification of Salt of carboxylic acid(quiz unknown(**	practical experiments	Various tests

١٣	٢	Recognize general organic compounds and distinguish between them. Apply chemical tests to identify different functional groups. Understand the basic reactions used for the identification of organic compounds.	**Identification of organic compound (general known)**	practical experiments	Various tests
١٤	٢	Identify organic compounds in an unknown sample using chemical tests. Apply practical knowledge to accurately interpret the results. Distinguish between different types of organic compounds in the unknown sample.	**Identification of organic compound (general quiz)**	practical experiments	Various tests
١٥	٢	Recognize the Cannizzaro reaction and its types. Understand the conditions, reactants, and products of the reaction. Apply the reaction to identify suitable organic compounds and analyze the results practically.	**Cannizzaro reaction**	practical experiments	Various tests

12. Course Evaluation	
20 marks for theory (midterm exam + daily exams) + 20 marks for practical 60 marks for the final exam (theory only) Total: 100 marks	
13. Learning and Teaching Resources	
Required textbooks (curricular books, if any	1-Morrison RT and Boyd RN, Organic Chemistry, 6th edd. 2008 2-Organic Chemistry by McCurry; 5th ed. Thomason learning; CA,USA; 2000
Main referen (sources)	1-Beale, J.M. and Block, J.H. (2011)" Wilson and Gisvold textbook of organic medicinal and pharmaceutical chemistry ;11th Edd.; WoltersKluwer. 2)Furniss B.S., Hannaford, A.J. and Tatchell,A.R.; Vogel text book of practical organic chemistry, 5th edd, 3) Vogel practical organic chemistry
Recommended books and references (scientific journals, reports…)	Journals of organic chemistry Theoretical and practical. practical organic chemistry
Electronic References, Websites	Google for searching organic chemistry. As ppt. and pdf and you tubes Include examples in each topic related to the preparation of certain medicines, as the college specializes in pharmacy, and to keep up with the development of drug preparation in an environmentally friendly manner.

Course Description Form

15. Course Name:
Organic chemistry III
16. Course Code:
17. Semester / Year:
Second Semester – Second Stage – 2025–2026
18. Description Preparation Date:

1-2-2026

19. Available Attendance Forms: Official daily attendance

Attendance

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

Total hours: 60 hours

Total units: 3 units

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

Name: Dr. Aseel Salah Mansour

Email: dr.aseel.salah21@gmail.com

Pharmacist Zahraa Amer Abdulameer

22. Course Objectives

Course Objective

A. Cognitive goals

- Statement of knowledge and basic principles in chemistry
- Conducting practical experiments of theoretical concepts
- Preparation of explanatory aids
- Preparing brief reports

B. The skill goals of the program

- Students will demonstrate knowledge in fields of organic chemistry
- Solve samples of questions related to the course

23. Teaching and Learning Strategies

Strategy

- reading different correlated books
- -use Scientific references

participate in workshops

24. Course structure (theoretical)

Week	Hours	Unit name	Learning method	Evaluation method
1.	٢	Heterocyclic system: Classes of heterocyclic systems; generalstructures; properties; Occurrence in nature and in medicinal products. I (Theory)	Lectures	quiz
2.	2	Heterocyclic system: Classes of heterocyclic systems; generalstructures; properties; Occurrence in nature and in medicinal products. II	Lectures	quiz
3.	2	Five-membered ring heterocycliccompounds: pyrrole; furan and thiophen. I	Lectures	quiz
4.	2	Five-membered ring heterocycliccompounds: pyrrole; furan and thiophen. II	Lectures	quiz
5.	2	Source of pyrrole, furan and thiophen. I	Lectures	quiz
6.	2	Source of pyrrole, furan and thiophen. II	Lectures	quiz
7.	2	Six-membered ring heterocycliccompounds: Structure & reactions of pyridine. I	Lectures	quiz
8.	2	Six-membered ring heterocycliccompounds: Structure & reactions of pyridine. II	Lectures	quiz
١٠-٩	٤	Six-membered ring heterocycliccompounds: Structure & reactions of pyridine. II		
١١	٢	Saturated five-membered heterocyclic compounds I	Lectures	quiz
١٢	٢	Saturated five-membered heterocyclic compounds II	Lectures	quiz
١٤-١٣	٤	Heterocyclic offive & six member rings with two & three heteroatoms.	Lectures	quiz
١٥	٢	Heterocyclic offive & six member rings with two & three heteroatoms	Lectures	quiz

14. Course Structure (practical)

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Conduct practical experiments	Aldol Condensation - Synthesis of Dibenzalacetone	Practical	quiz

2	2	Conduct practical experiments	Aldol Condensation - Synthesis of Dibenzalacetone (quizand unknown)	Practical	quiz
3	2	Conduct practical experiments	Synthesis of p-Nitro acetanilide from Acetanilide (Electrophilic Aromatic Substitution	Practical	quiz
4	2	Conduct practical experiments	(quiz- unknown Synthesis of p-Nitro acetanilide from Acetanilide (Electrophilic Aromatic Substitution)	Practical	quiz
5	2	Conduct practical experiments	Synthesis of p-nitroaniline from aniline based on protection/deprotection of amine group	Practical	quiz
6	2	Conduct practical experiments	(Synthesis of p-nitroaniline from aniline based on protection/deprotection of amine group quiz-unknown)	Practical	quiz
7	2	Conduct practical experiments	Cross aldol condensation Preparationof 1-(4-methoxyphenyl)-3-phenylprop-2-en-1-one	Practical	quiz
8	2	Conduct practical experiments	Cross aldol condensation Preparationof 1-(4-methoxyphenyl)-3-phenylprop-2-en-1-one (Quiz- unknown)	Practical	

9	2	Conduct practical experiments	Cannizzaro reaction	Practical	quiz
10	2	Conduct practical experiments	Cannizzaro reaction (Quiz- unknown)	Practical	quiz
11	2	Conduct practical experiments	Cannizzaro raction part 2 Synthesis of benzoic acid and benzal alcohol	Practical	quiz
12	2	Conduct practical experiments	Preparation of Benzoic Acid from Benzyl Chloride	Practical	quiz
١٣	٢	Conduct practical experiments	Preparation of Acetanilide	Practical	quiz
١٤	٢	Conduct practical experiments	Mechanochemical synthesis of racemic 1,1'- bi-2-naphthol and 2,3-diphenylquinoxaline	Practical	quiz
١٥	٢	Conduct practical experiments	Mechanochemical synthesis of racemic 1,1'- bi-2-naphthol and 2,3-diphenylquinoxaline (quiz- unknown)	Practical	quiz

15. Course Evaluation

20 marks for theory (midterm exam + daily exams) + 20 marks for practical

60 marks for the final exam (theory only)

Total: 100 marks

16. Learning and Teaching Resources

Required textbo (curricular books, any)	Organic Chemistry by Robert T. Morrison and Robert N. Boyed, latest edition.
Main referen (sources)	Organic Chemistry by J. McMurry, latest ed., Thomason learning, CA, USA
Recommended books and references (scientific journals, reports…)	John McMurry "Organic Chemistry with Biological Applications" 3rd Edition Cengage Learning, USA (**2015**).
Electronic References, Websi	Google searching for organic chemistry

Course Description Form

25. Course Name:
Medical Microbiology I
26. Course Code:
27. Semester / Year:
First Semester – Second Stage – 2025–2026
28. Description Preparation Date:1

٢٠٢٥-٢-١

29. Available Attendance Forms:

Attendance

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

Total hours: 75 hours

Total units: 4 units

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

Dr. Atheer Khudair Hamad

Email: atheerspace@gmail.com

Asst. Lect. Alaa Mohsen Ali

Email: alaa.mohsen@gu.edu.iq

32. Course Objectives

Course Objective

A. Cognitive goals

- Statement of knowledge and basic principles in chemistry
- Conducting practical experiments of theoretical concepts
- Preparation of explanatory aids
- Preparing brief reports

B. The skill goals of the program

- Students will demonstrate knowledge in fields of organic chemistry
- Solve samples of questions related to the course

33. Teaching and Learning Strategies

Strategy

theoretical lectures

practical experiments

34. Course structure (theoretical)

Week	Hours	Unit name	Learning metho	Evaluation method
1	٣	Importance of microbiology, History of microbiology an Anatomy of bacteria: Surface appendage, Capsule, Cell wall of G.+ve & G –ve bacteria, Cytoplasmic membrane and Morphology of Bacteria, Stainir and Classification	Lectures	quiz
2	٣	. Bacterial physiology: Physica and chemical growth determinat growth and growth curves, bacterial reproduction	Lectures	quiz
3	٣	Genetics: Definition, genetic, element, mutation (spontaneou gene transfer, transformation, conjugation, and gene transduction).	Lectures	quiz
4	٣	Recombinant DNA biotechnolo and Sporulation and germinatio	Lectures	quiz
5	٣	. Sterilization (chemical + physical Methods).	Lectures	quiz
6	٣	Chemotherapy. And Antibiotic	Lectures	quiz
٧	٣	Staphylococci species:		
٨	٣	Staphylococci species: Streptococcus pyogenes. Streptococcus pneumoniae		

٠	٣	Aerobic Spore- forming bacteria Bacillus species (B. anthracis, B. subtilis, B. cases).		
10	٣	Clostridium perfringens; Clostridium tetani; Clostridiun botulinum	Lectures	quiz
11	٣	Corynebacterium diphtheria an Propionibacterium acnes, Lister	Lectures	quiz
12	٣	Mycobacterium tuberculosis; M leprae	Lectures	quiz
13	٣	Chlamydia; Actinomycetes	Lectures	quiz
14	٣	Enterobacteriaceae: E. coli; Klebsiella spp.; Citrobacter, Serta Lia, Hafnia Enterobacter	Lectures	quiz
15	٣	Shigella spp; Salmonella spp; Proteus spp , Pseudomonas spp and Vibrio Cholerae; Brucella spp; Hemophilus spp; Campylobacter spp		

17. Course Structure (practical)

Week	Hours	Unit or subject name	Learning method	Evaluation method
1	2	Orientation to the laboratory. Rules	Practical	Quiz

		of conduct and general safety. Microscopic techniques. Bright-field light microscope.		
2	2	Examination of stained microorganisms; Smear preparation and simple staining; Gram staining.	Practical	Quiz
3	2	The hanging drop slide and bacterial motility; Acid-fast staining procedure.	Practical	Quiz
4	2	Bacterial spores and endospores staining; Microbiological. culture media and sterilization; Methods of inoculation and isolation of pure culture.	Practical	Quiz
5	2	Action of dyes and antibiotics; Enzymes assays for some specific microbial enzymes.	Practical	quiz

6	2	Assays for specific metabolic activities; Acid and gas production from: Carbohydrate fermentation; Triple sugar iron agar test. IMVIC tests.	Practical	quiz
7	2	Systemic bacteriology: Staphylococci spp.	Practical	quiz
8	2	Streptococci species.	Practical	
9	2	Salmonella species	Practical	quiz
10	2	Shigella species.	Practical	quiz
11	2	Pseudomonas species.	Practical	quiz
١٢	2	Proteus species.	Practical	Quiz
١٣	٢	*Escherichia coli*		
١٤	٢	*Klebsiella species.*		
١٥	٢	*Candida albicans.*		

18. Course Evaluation
20 marks for theory (midterm exam + daily exams) + 20 marks for practical 60 marks for the final exam (theory only) Total: 100 marks

19. Learning and Teaching Resources	
Required textbooks (curricu books, if any)	1.Medical Microbiology, seventeenth edition E .Jawetz, J.L. Melnick, E.A. Adel 1987 2. Principles of microbiology by Roland M.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic Referenc Websites	

Course Description Form

35. Course Name:
Computer Sciences
36. Course Code:

37. Semester / Year:

First Semester – Second Stage – 2025–2026

38. Description Preparation Date:

٢٠٢٦-٢-١

39. Available Attendance Forms:

Attendance

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

Total hours: 45 hours

Total units: 2 units

1 hour theoretical + 2 hours practical

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

Assistant Lecturer Janat Tareq Fannous

jannat.tariq@gu.edu.iq

42. Course Objectives

1) Provide a thorough overview of the fundamental concepts of computer applications.

2) The course covers the use of Microsoft Excel and Google applications in detail.

43. Teaching and Learning Strategies

Use of the smart board

Use of presentation slides

Requirement for periodic reports

Course Structure (Theoretical + Practical)

Week	Hours	Unit or subject name	Learning method	Evaluation method

1	١	Introduction to Excel	Theoretical and Practical	Quizzes Midterm Exam Final Exam
2	١	Insert tab	Theoretical and Practical	Quizzes Midterm Exam Final Exam
3	٢	Insert tab	Theoretical and Practical	Quizzes Midterm Exam Final Exam
4	١	Page Layout and Basic Functions	Theoretical and Practical	Quizzes Midterm Exam Final Exam
5	١	Logical Functions	Theoretical and Practical	Quizzes Midterm Exam Final Exam
٧-٦	٢	Logical Functions	Theoretical and Practical	Quizzes Midterm Exam Final Exam

٩-٨	٢	Data	Theoretical and Practical	Quizzes Midterm Exam Final Exam
١١-١٠	٢	Review and view	Theoretical and Practical	Quizzes Midterm Exam Final Exam
١٥-١٢	٣	Developer	Theoretical and Practical	Quizzes Midterm Exam Final Exam

Course Evaluation	
20 marks for theory (midterm exam + daily exams) + 20 marks for practical 60 marks for the final exam (theory only) Total: 100 marks	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1) Microsoft office Professional, BY Linda Foulkes, Senior Editor: Afshaan Khan . 2) Microsoft office Professional, BY Joyce Cox, Jo an Lambert & Curtis Frge
Main references (sources)	

Recommended books and references (scientific journals, reports…)	
Electronic Referenc Websites	

Course Description Form

1. Course Name:

Crimes of the Ba'ath Regime in Iraq

2. Course Code:

3. Semester / Year:

First Semester – Second Stage – 2025–2026

4. Description Preparation Date:

٢٠٢٦-٢-١

5. Available Attendance Forms:

Attendance

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

Total number of hours: 30 hours

Total number of credits: 2 credits

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

Asst. Lect. Humam Ali Sabeeh

humam.a.sabeeh@gu.edu.iq

8. Course Objectives

Enlightening this generation with an intellectual awakening that reveals to it some of the crimes of this regime—crimes that m neither legally nor morally remain concealed from free and civilized people.

Clarifying the investigative and truth-seeking system's documentary resources that uncover aspects of the crimes of the Ba'a regime.

Documenting the crimes of the Ba'ath regime in accordance with the Law of the Iraqi High Criminal Court (2005).

9. Teaching and Learning Strategies

Delivering lectures and using the discussion and dialogue method

Course Structure (Theoretical)

Week	Hours	Unit or subject name	Learning method	Evaluation method
١-٢	٤	Definition of Crime: Linguistically and Terminologically	Lecture	Question and Answer
٣-٤	٤	Human Rights Violations	Lecture	Question and Answer
٥-٦	٤	Psychological Crimes and Their Effects	Lecture	Question and Answer
٧-٨	٤	Violations of Iraqi Laws Human Rights Violations and Crimes of the Ba'ath Party Regime	Lecture	Question and Answer
٩-١٠	٤	Decisions on the Political and Military Violations of the Ba'ath Regime The false accusation of plotting a coup against anyone opposing the Ba'ath regime to purge its opponents within the army	Lecture	Question and Answer
١١-١٢	٤	Environmental Crimes War-related and Radioactive Pollution and Landmine Explosions	Lecture	Question and Answer

13-15	6	Radioactive contaminationUse of internationally prohibited weapons	Lecture	Question and Answer

Course Evaluation
٣0 marks for theory (midterm exam + daily exams) ٧0 marks for the final exam (theory only) Total: 100 marks

Learning and Teaching Resources	
Required textbooks (curricular books, if any)	United Nations Reports Condemning the Ba'ath Regime – Human Rights Violations (1991–2003) Dr. Raed Abis and Dr. Abbas Atiyah, Publisher: Iraqi Center for Documenting Extremism Crimes, First Edition Archive of the Iraqi Center for Documenting Extremism Crimes at the Holy Abbasid Shrine.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic Referenc Websites	

Course Description Form

10. Course Name:
Pharmacognosy I
11. Course Code:
12. Semester / Year:
Second Semester – Second Stage – 2025–2026
13. Description Preparation Date:
1–2–2026
14. Available Attendance Forms:
Attendance
15. Number of Credit Hours (Total) / Number of Units (Total)
Total number of hours: 75 hours Total number of credits: 4 credits
16. Course administrator's name (mention all, if more than one name)
Asst. Lect. Noor Ahmed Noor.a.hammadi@gu.edu.iq Pharmacist Mustafa Ahmed
17. Course Objectives
This course is intended to study the scope of Pharmacognosy,

medicinal plant nomenclature, classification of natural products, phytochemistry which include extraction and isolation of active constituents from natural sources.

18. Teaching and Learning Strategies

1. Using the smart board for slide presentation in theoretical part
2. Experimental work

19. Course Structure (Theoretical)

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	General Introduction: The Scope of Pharmacognosy, definitions and basic principles. Drugs from natural sources, crud drugs, official and non-official drugs.		Slide show, smart board and scientific references	Monthly written exams, daily written exams, oral exams, quizzes
2	3	Classification of natural products. Plant nomenclature and taxonomy.		Slide show, smart board and scientific references	Monthly written exams, daily written exams, oral exams, quizzes
3	3	Production of crude drugs: Cultivation, collection, drying and storage. Deterioration of crude natural products.		Slide show, smart board and scientific references	Monthly written exams, daily written exams, oral exams, quizzes

4	3	Pharmacological activities of natural products. Chemistry of natural drug products.	Slide show, smart board and scientific references	Monthly written exams, daily written exams, oral exams, quizzes	
5	3	Quality control: Evaluation of natural products; macroscopical evaluation; physical evaluation; chemical evaluation; biological evaluation; spectroscopical evaluation.	Slide show, smart board and scientific references	Monthly written exams, daily written exams, oral exams, quizzes	
6	3	Separation technique: introduction, mechanisms of separation and classification based on the type of technique.	Slide show, smart board and scientific references	Monthly written exams, daily written exams, oral exams, quizzes	
7	3	Paper chromatography, Thin layer chromatography	Slide show, smart board and scientific references	Monthly written exams, daily written exams, oral exams, quizzes	
8	3	Column chromatography	Slide show, smart board and scientific references	Monthly written exams, daily written exams, oral exams, quizzes	
9	3	High performance liquid chromatography	Slide show, smart board and scientific references	Monthly written exams, daily written exams, oral exams, quizzes	
10	3	Gas chromatography	Slide show, smart board and scientific references	Monthly written exams, daily written exams, oral exams, quizzes	
11	3	GEL filtration chromatography	Slide show, smart board and scientific references	Monthly written exams, daily written exams, oral exams, quizzes	

12	3	Ion exchange chromatography	Slide show, smart board and scientific references	Monthly written written exams, oral exams, quizzes
13	3	Affinity chromatography		
14	3	Plant tissue culture	=	=
15	3	Review before final exam		

20. Course structure (practical)

week	hours	Description
1	2	Micro measurement and magnification
2	٤	Microscopical identification of crude drugs and cell contents
3	2	Extraction and separation techniques.
4	2	=
5	2	Chromatography.
6	2	=
7	2	Paper chromatography (circular and horizontal paper chromatography).
8	2	=
9	2	Introduction to thin-layer chromatography
10	2	TLC on microscope slides
11	2	Partition chromatography for the separation of volatile oils.
12	2	=
13	2	Effect of activity of adsorbents on Rf values
14	2	=

21. Course Evaluation

20 marks for theory (midterm exam + daily exams) + 20 marks for practical

60 marks for the final exam (theory only)

Total: 100 marks

22. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Trease and Evans Pharmacognosy; 15th ed., 2000. 2. Practical manual / second stage Pharmacognosy
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

23. Course Name:
Medical Microbiology II
24. Course Code:
25. Semester / Year:
Second Semester – Second stage – 2025-2026
26. Description Preparation Date:
٢٠٢٦-٢-١
27. Available Attendance Forms:
Attendance
28. Number of Credit Hours (Total) / Number of Units (Total)
Total Hours: 60 hours Total Credits: 3 credits
29. Course administrator's name (mention all, if more than one name)
Asst. Lect. Alaa Mohsen Ali alaa.mohsen@gu.edu.iq
30. Course Objectives
Providing a basic understanding of bacterial morphology, anatomy, physiology, and genetics, along w methods for handling, visualization, and characterization
31. Teaching and Learning Strategies

Course Structure (Theoretical)					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

15 weeks	45 hours	Knowledge and application	Parasitology : Introduction. Intestinal and tissue protozoa Helminthes Cestodes Trematodes Nematods Virology: Introduction RNA viruses DNA viruses Immunology: introduction, innate and adaptive immunity, complement, MHC molecule and autoimmu diseases, hypersensitivity, tumo immunity, immunodeficiency, immunological methods	in person education lectures using data show (PowerPoint) software	Short quizzes Term exam Final exam

1	3	Students acquire information in the field of parasites to the required level	Introduction to medical parasitology	Slide show andsmart board	Monthly written exams, daily written exams, oral exams, quizzes
2	3	Students	Introduction to	Slide show and	Monthly written

		acquire information in the field of parasites to the required level	protozoa, *Entamoeba histolytica, E. coli*, *Entamoeba gingival is*, *Endolimax nana*, *Entamoeba. Butchlii*	smart board	exams, daily written exams, oral exams, quizzes
3	3	Students acquire information in the field of parasites to therequired level	A. The flagellates of digestive tract and genital organs: *Giardia lamblia*, *Trichomonas vaginalis*, *Trichomonas tenax*, *Trichomonas hominis.* Ciliates: *Balantidium coli*	Slideshow and smart board	Monthly written exams, daily written exams,oral exams, quizzes
4	3	Students acquire information in the field of parasites to the required level	B. Blood & tissue flagellates: *Leishmania* spp. and *Trypanosome*spp.	Slide show and smart board	Monthly written exams, daily written exams,oral exams, quizzes
5	3	Students acquire information in the field of parasites to the	Sporozoa: A. Malaria parasite *Plasmodium spp.*	Slide show and smart board	Monthly written exams, daily written exams,oral exams,

					quizzes
6	3	Students acquire information in the field of parasites to the required level	B. Toxoplasmosis *Toxoplasma gondii*	Slide show andsmart board	Monthly writtenexams, daily written exams, oral exams, quizzes
7	3	Students acquire information in the field of parasites to the required level	Helminths: Introduction and Classification, Trematoda: Blood flukes or Schistosomes	Slide show andsmart board	Monthly writtenexams, daily written exams, oral exams, quizzes
8	3	Students acquire information in the field of parasites to the required level	Cestoda: A. Adult tapeworm Infections: *Taenia saginata*, *Taenia solium*, *Hymenolepis nana*	Slide show andsmart board	Monthly writtenexams, daily written exams, oral exams, quizzes
9	3	Students acquire information in the field of parasites to the required level	B. larval tapeworm infection: *Echinococcus granulosus*, *multilocularis*	Slide show andsmart board	Monthly writtenexams, daily written exams, oral exams, quizzes
10	3	Students acquire information in the field of parasites to the required level	Nematodes: Introduction to Nematodes: *Ascaris lumbricoides*,	Slide show andsmart board	Monthly writtenexams, daily written exams, oral exams, quizzes

11	3	Students acquire information in the field of parasites to the required level	*Ancylostoma duodenale*, *Enterobius vermicularis*	Slide show andsmart board	Monthly writtenexams, daily written exams, oral exams, quizzes
12	3	Students acquire information in	General Laboratory Diagnostic Techniques and Samples, Review	Slide show andsmart board	Monthly written exams, daily written exams, oral exams,
Course description (virology)					
1	1	Introduction toVirology		Slide show and smart board	oral exams, quizzes
2	1	Replication of viruses		Slide show and smart board	oral exams, quizzes
3	1	Chemotherapy		Slide show and smart board	oral exams, quizzes

4	1	Herpesviruses	Slide show andsmart board	=
5	1	Hepatitis viruses	Slide show andsmart board	=
7	1	Retro viruses & AIDS, SARS, Ebola Lassa viruses	Slide show andsmart board	=
8	1	Alteration genetictransformation of virus	Slide show andsmart board	Monthly written exams, daily written exams, oral exams, quizzes
9	1	Oncogenic viruses	Slide show andsmart board	Monthly written exams, daily written exams, oral exams, quizzes
Course structure (Immunology)				

1	2	General information in immunology	General informationin immunology	Slide show and smart board	Monthly written exams, daily written exams, oral exams, quizzes
2	2	Innate and adaptive immunity	Innate and adaptive immunity	Slide show and smart board	Monthly written exams, daily written exams, oral exams, quizzes
3	2	Study of antigen characteristic	Antigen characteristic	Slide show and smart board	Monthly written exams, daily written exams, oral exams, quizzes
4	2	Study of B andT cells	B and T	Slide show and smart board	Monthly written exams, daily written exams, oral exams, quizzes
5	2	Study of the complement andits role in in the immunity	Complement	Slide show and smart board	Monthly written exams, daily written exams, oral exams, quizzes
6	2	Study of autoimmune	Autoimmune disease 1	Slide show and smart board	Monthly written exams,
7	2	Study of autoimmune diseases	Autoimmunedisease 2	Slide show and smart board	Monthly written exams, daily written exams, oral exams, quizzes
8	2	Study of antibody characteristic	Antibody characteristic	Slide show and smart board	Monthly written exams, daily written exams, oral exams, quizzes

9	2	understand the mechanisms of immunity against cancer diseases	Oncogenicimmunity	Slide show and smart board	Monthly written exams, daily written exams, oral exams, quizzes
10	2	Study of Hypersensitivity reactions	Hypersensitivitytype-1	Slide show and smart board	Monthly written exams, daily written exams, oral exams, quizzes
11	2	Study of Hypersensitivity reactions	Hypersensitivitytype-2	Slide show and smart board	Monthly written exams, daily written exams, oral exams, quizzes
12	2	Study the Immune deficiencydiseases	Immune deficiency diseases	Slide show and smart board	Monthly written exams, daily written exams, oral exams, quizzes
13	2	Complete the study of Immunedeficiency diseases	Complete Immune deficiency diseases	Slide show and smart board	Monthly written exams, daily written exams, oral exams, quizzes

Course Evaluation

20 marks for theory (midterm exam + daily exams) + 20 marks for practical

60 marks for the final exam (theory only)

Total: 100 marks

Learning and Teaching Resources

Required textbooks (curricular books, if any)	1.Medical Microbiology, seventeenth edition E .Jawe J.L.Melnick, E.A. Adel 1987
Main references (sources)	2. Principles of microbiology by Roland M.

Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

6-Course Name:
Arabic Language
12. Course Code:
13. Semester / Year:
Second Semester – Second stage – 2025–2026
14. Description Preparation Date:
٢٠٢٦–٢–١
15. Available Attendance Forms:
attendance
16. Number of Credit Hours (Total) / Number of Units (Total)
Total hours: 30 hours Total credits: 2 credits

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

Asst. Lecturer Abdulhussein Ali Abdulhussein

abdulhussein.ali@gu.edu.iq

18. Course Objectives

1- Enabling the student to acquire cognitive skills regarding linguistic concepts.

2- Developing the student's expressive abilities.

3- Teaching students to distinguish between the root of a word and its additions, and their effect or enhancing meaning.

4- Teaching students the methods and rules for controlling and structuring vocabulary.

19. Teaching and Learning Strategies

Using the smart board.

Using presentation slides (PowerPoint).

20. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	ان يكتسب الطالب مهارة اتقان وضبط القواعد وتقوية ملكة الطالب اللغوية.	النحو - قسام الكلام (اسم وفعل وحرف) المبتدأ وانواعه الخبر وانواعه	Lecture delivery, class discussion, and exercises	Interactive Questions and Classroom Discussions
٢	٢	ان يكتسب الطالب مهارة اتقان وضبط القواعد وتقوية ملكة الطالب اللغوية	كان واخواتها إن واخواتها	Lecture delivery, class discussion, and exercises	Interactive Questions and Classroom Discussions
3	2	ان يكتسب الطالب مهارة اتقان وضبط القواعد	المثنى والملحق به	Lecture delivery, class	Interactive Questions and

		وتقوية ملكة الطالب اللغوية.	جمع المذكر السالم والملحق به جمع المؤنث السالم والملحق به الاسماء الخمسة	discussion, and exercises	Classroom Discussions
٤	٢	ان يكتسب الطالب مهارة اتقان وضبط القواعد وتقوية ملكة الطالب اللغوية.	**بناء الفعل الماضي**	Lecture delivery, class discussion, and exercises	Interactive Questions and Classroom Discussions
5	2	ان يكتسب الطالب مهارة اتقان وضبط القواعد وتقوية ملكة الطالب اللغوية.	بناء الفعل الامر	Lecture delivery, class discussion, and exercises	Interactive Questions and Classroom Discussions
٦	٢	ان يكتسب الطالب مهارة اتقان وضبط القواعد وتقوية ملكة الطالب اللغوية.	الاسماء المنصوبة (المفعول به – المفعول المطلق – المفعول لاجله – المفعول فيه – المفعول معه)	Lecture delivery, class discussion, and exercises	Interactive Questions and Classroom Discussions
7	2	ان يكتسب الطالب القدرة على قراءة وتحليل النصوص الادبية وفهمها واستيعاب مضمونها .	**الشعر – نازك الملائكة**	Lecture delivery, class discussion, and exercises	Interactive Questions and Classroom Discussions
٨	٢	ان يكتسب الطالب القدرة على قراءة وتحليل النصوص الادبية وفهمها واستيعاب مضمونها .	الشعر – محمد مهدي الجواهري	Lecture delivery, class discussion, and exercises	Interactive Questions and Classroom Discussions
9	2	أن يكتسب الطالب المهارات اللغوية ويحسن من خلالها الرسم الكتابي	الاملاء- كتابة الهمزة (الوصل والقطع)	Lecture delivery, class discussion, and exercises	Interactive Questions and Classroom Discussions
١٠	٢	أن يكتسب الطالب المهارات اللغوية ويحسن من خلالها الرسم الكتابي وصولاً الى إجادة الكتابة والتعبير عنها بصورة فصيحة	**الهمزة المتوسطة والمتطرفة**	Lecture delivery, class discussion, and exercises	Interactive Questions and Classroom Discussions

11	2	أن يكتسب الطالب المهارات اللغوية ويحسن من خلالها الرسم الكتابي وصولاً الى إجادة الكتابة والتعبير عنها بصورة فصيحة	**كتابة الضاد والظاء**	Lecture delivery, class discussion, and exercises	Interactive Questions and Classroom Discussions
١٢	٢	أن يكتسب الطالب المهارات اللغوية ويحسن من خلالها الرسم الكتابي وصولاً الى إجادة الكتابة والتعبير عنها بصورة فصيحة	**كتابة التاء القصيرة والطويلة**	Lecture delivery, class discussion, and exercises	Interactive Questions and Classroom Discussions
13	2	أن يكتسب الطالب المهارات اللغوية ويحسن من خلالها الرسم الكتابي وصولاً الى إجادة الكتابة والتعبير عنها بصورة فصيحة	**علامات الترقيم –قاعدة الالف الفارقة**	Lecture delivery, class discussion, and exercises	Interactive Questions and Classroom Discussions
١٤	٢	أن يكتسب الطالب المهارات اللغوية ويحسن من خلالها الرسم الكتابي وصولاً الى إجادة الكتابة والتعبير عنها بصورة فصيحة	**كتابة العدد**	Lecture delivery, class discussion, and exercises	Interactive Questions and Classroom Discussions
15	2	ان يكتسب الطالب القدرة على اتقان القراءة الصحيحة لايات القرآن الكريم ومعرفة معاني القرآن وتنمية قدرة الطالب على الحفظ والنطق السليم	**القرآن الكريم – سورة يس**	Lecture delivery, class discussion, and exercises	Interactive Questions and Classroom Discussions
21. Course structure (practical)					

12. Course Evaluation
٣0 marks for theory (midterm exam + daily exams)
٧0 marks for the final exam (theory only)
Total: 100 marks

4. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Expression, Composition, Handwriting, and Dictation / Prof. Dr. Abdulrahman Mutlak Al-Jubouri
Main references (sources)	القرآن الكريم The Holy Quran أوضح المسالك لألفية ابن مالك / ابن هشام Awḍaḥ al-Masālik fī Alfiyyat Ibn Mālik / Ibn Hisham شرح قطر الندى وبل الصدى لابن هشام Sharḥ Qaṭr al-Nadā wa Ball al-Ṣa by Ibn Hisham همع الهوامع للسيوطي Hamaʿ al-Hawāmʿ by Al-Suyuti النحو الوافي لعباس حسن Al-Naḥw al-Wāfī by Abbas Hass شذا العرف في فن الصرف Shudhā al-ʻUrf fī Fan al-Ṣarf المهذب في الصرف Al-Muḥadhdhab fī al-Ṣarf
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

32. Course Name:
Physical pharmacy II
33. Course Code:
34. Semester / Year:
Second Semester – Second Stage– 2025–2026
35. Description Preparation Date:
٢٠٢٦–٢–١
36. Available Attendance Forms:
Attendance
37. Number of Credit Hours (Total) / Number of Units (Total)
Total Hours: 75 hours Total Credits: 4 credits
38. Course administrator's name (mention all, if more than one name)
1- Dr. Ahmed Yaseen Al-Shar'ah Ahmed.yaseen.alsharea@gau.edu.iq 2-Asst. Lect. Qasim Khalid Qasim.khalid@gau.edu.iq
39. Course Objectives
1-Understanding complex formation phenomena, compound classification, and the methods used for their analysis. 2-Exploring the principles of drug diffusion, including Fick's laws, membrane transport, and factors affecting permeability. 3-Analyzing the chemical kinetics of drug degradation and conducting stability studies using reaction rate laws and accelerated tests. 4-Studying interfacial phenomena, surface tension, diffusion, and the role of surfactants in wetting and formulation stability. 5-Examining the rheological properties of pharmaceutical systems, including flow behavior and methods for characterizing flow. 6-Learning about colloidal systems, particle science, and polymer science, with a focus on particle behavior, formulation effects, pharmaceutical applications.

40. Teaching and Learning Strategies
Conducting practical experiments, reading textbooks, engaging in scientific discussio performing laboratory experiments, reading textbooks.

41. Course Structure (theoretical)

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	4	To understand	Complexation (Chapter 10) • Classification of complexes • Metal complexes • Organic molecular complexes • Inclusion compounds Methods of analysis	Lectures	Oral Exams + Homework
2-4	6	To understand	Diffusion (Chapter 11) • Introduction • Steady state diffusion • Fick's first law of diffusion • Fick's second law • Diffusion through membranes • Permeability • Diffusion driving forces • Lag time Apparatus and methods assessing drug diffusion	Lectures	Oral Exams + Homework

4-6	7	To understand	Chemical kinetics and stability (Chapter 14) • Introduction • Rates, orders and molecularity of reactions • Temperature effects • Other factors effects • Stability of pharmaceuticals Accelerated stability and st testing		Oral Exams Homework
6-8	6	To understand	Interfacial phenomena (Chapter 15) • Classification of interfaces • Liquid interfaces • Surface and interfacial tensions • Surface free energy • Measurement of interfacial tension • 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	Lectures	Oral Exams Homework

			• Wetting and wetting agents • Applications of surface-active agents • Foam and antifoaming agents Electric properties interfaces		
8-10	6	To understand	Interfacial phenomena (Chapter 15) • Classification of interfaces • Liquid interfaces • Surface and interfacial tensions • Surface free energy • Measurement of interfacial tension • 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 • Wetting and wetting agents • Applications of surface-active agents	Lectures	Oral Exams Homework

			• Foam and antifoaming agents Electric properties interfaces		
10-12	6	To understand	Colloidal dispersions (Chapter 17) • Introduction to disperse systems • Types of colloidal systems • Optical properties of colloids • Kinetic properties of colloids • Electrical properties of colloids • Solubilization using colloids Pharmaceutical applicatior colloids	Lectures	Oral Exams Homework
12-14	5	To understand	Micrometrics (Chapter 19) • Particle size and size distribution • Methods of determining particle size • Particle shape and surface area • Methods for determining surface area Derived properties of powc (porosity, pac arrangements, densities particles, bulkiness and f properties)	Lectures	Oral Exams + Homework

14-15	5	To understand	Pharmaceutical polymers (Chapter 21) • 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	Lectures	Oral Exams + Homework

42. Course description (practical)

week	hours	Unit name	Learning method	Evaluation
١	4	Solubilization of components of pharmaceutical preparations.	Lab	Quiz
٢	4	Solubilization of Aspirin.	=	=
٣	٢	Surface tension: measurements and calculations	=	=
٤	4	Rate kinetics: Application in stability of pharmaceutical stability	=	=
٥	4	Determination of critical micelles concentration	=	=

٦	6	Viscosity: Measurements and calculations	=	=
7	6	**Determination of particle size by optical microscopy and Sedimentation**	=	=

Practical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
٢–١	٤	Understanding methods for dissolving components of pharmaceutical preparations and improving their solubility	Solubilization of components of pharmaceutical preparations.	Using the smart board, conducting experiments, and solving mathematical problems	Discussions and evaluation of practical results
٤–٣	٤	Understanding methods for dissolving aspirin and improving its solubility in solutions	Solubilization of Aspirin.	Using the smart board, conducting experiments, and solving mathematical problems	**Discussions and evaluation of practical results**
٥	٢	Understanding the measurement of surface tension and its calculations	Surface tension: measurements and calculations	Using the smart board, conducting experiments, and solving mathematical problems	**Discussions and evaluation of practical results**
٧–٦	٤	Understanding the application of reaction kinetics in evaluating drug stability	Rate kinetics: Application in stability of pharmaceutical stability	Using the smart board, conducting experiments, and solving	**Discussions and evaluation of practical results**

				mathematical problems	
٩–٨	٤	Understanding how to determine the critical micelle concentration (CMC)	Determination of critical micelles concentration	Using the smart board, conducting experiments, and solving mathematical problems	**Discussions and evaluation of practical results**
١٢–١١–١٠	٦	Understanding viscosity measurement and its calculations	Viscosity: Measurements and calculations	Using the smart board, conducting experiments, and solving mathematical problems	**Discussions and evaluation of practical results**
١٥–١٤–١٣	٦	Understanding particle size measurement using optical microscopy and sedimentation methods	Determination of particle size by optical microscopy and Sedimentation	Using the smart board, conducting experiments, and solving mathematical problems	**Discussions and evaluation of practical results**

54. Course Evaluation	
20 marks for theory (midterm exam + daily exams) + 20 marks for practical 60 marks for the final exam (theory only) Total: 100 marks	
55. Learning and Teaching Resources	
Required textbooks (curricular book: any)	Martin's Physical Pharmacy and Pharmaceutical Sciences; 7th edition; 2017. Aulton's Pharmaceutics; The Design and Manufacture of Medicines; 6th edition, 2022
Main references (sources)	

Recommended books and references (scientific journals, reports...)	

Course Description Form

43. Course Name:
Physical pharmacy I
44. Course Code:
45. Semester / Year:
First Semester – Second Stage– 2025–2026
46. Description Preparation Date:
٢٠٢٦-٢-١
47. Available Attendance Forms:
Attendance
48. Number of Credit Hours (Total) / Number of Units (Total)
Total Hours: 75 hours Total Credits: 4 credits
49. Course administrator's name (mention all, if more than one name)
Dr. Ahmed Yaseen Al-Sharea

Ahmed.yaseen.alsharea@gau.edu.iq

Asst. Lect. Qasim Khalid

Qasim.khalid@gau.edu.iq

50. Course Objectives

1. Understanding the states of matter, molecular interactions, and phase equilibria, including the phase rule and thermal analysis techniques.
2. Analyzing the properties of non-electrolyte solutions, including colligative behavior and methods for determining molecular weight.
3. Studying the behavior of electrolyte solutions by applying dissociation theories, ionic strength, and expressions of colligative properties.
4. Exploring solubility and distribution phenomena, focusing on solute-solvent interactions and partitioning between immiscible phases.
5. Applying principles of ionic equilibrium, acid-base theories, pH calculations, and the effect of ionic strength on solution behavior.
6. Understanding the composition and function of buffer and isotonic solutions in maintaining pH and physiological compatibility.

51. Teaching and Learning Strategies

Using the smart board

Using slide presentations

Requesting periodic reports

52. Course Structure (theoretical)

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-3	9	To understand	**States of matter (Chapter 2)** • **Binding forces between molecules** • **States of matter** • **The gaseous state** • **The liquid state**	Smart Board	Interactive Questions and Discussions

			• **Solids and crystalline state** • **The liquid crystalline state** • **The supercritical fluid state** • **Thermal analysis** • **Phase equilibria and phase rule** **Solid dispersions**		
4-5	6	To understand	Nonelectrolytes (Chapter 5) • Physical properties of substances • Types of solutions • Concentration expressions • Ideal and real solutions • Colligative properties Molecular we determination.	Smart Board	Interactive Questions and Discussions
6-7	6	To understand	Electrolyte solutions (Chapter 6) • Properties of solutions of electrolytes • Theory of dissociation • Theory of strong electrolytes • Ionic strength • The Debye-Hückel theory Coefficients for expres colligative properties	Smart Board	Interactive Questions and Discussions
8-11	12	To understand	Solubility and distribution phenomena (Chapter 9) • Introduction	Smart Board	Interactive Questions and Discussions

			• Solvent-solute interactions • Solubility of liquids in liquids • Solubility of solids in liquids • Determining thermodynamic and kinetic solubility • Poor aqueous solubility • Measuring solubility Distribution of sol between immisc solvents		
12-13	6	To understand	Ionic equilibria (Chapter 7) • Introduction • Brønsted–Lowry theory • Ionization and dissociation • Classification of solvents • Lewis electronic theory • Acid-base equilibria Calculation of pH acidity constants	Smart Board	Interactive Questions and Discussions
14-15	6	To understand	Buffered and isotonic solutions (Chapter 8) • The buffer equation • Buffer capacity Buffers in pharmaceut and biological systems	Smart Board	Interactive Questions and Discussions

53. Course description (practical)

week	hours	Unit name	Learning method	Evaluation

١	٢	Introduction to physical pharmacy	Lab	Quiz
٢	٤	Expression of concentrations in pharmaceutical preparations	=	=
٣	٤	Two-component systems containing liquid phases	=	=
٤	٤	Three-component systems	=	=
٥	٤	Tie linear for three-component systems	=	=
٦	٢	Partition coefficient: Measurements and evaluation	=	=
7	٤	**Solubility methods**		
8	٤	Buffer solutions	=	=
9	٢	Determination of solubility product constant of slightly soluble salts	=	=

Practical					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
١	٢	Understanding the concept of physical pharmacy and its role in drug preparation Identifying the fundamental properties of pharmaceutical materials Recognizing the effects of physical and chemical forces on drugs	Introduction to physical pharmacy	Using the smart board, conducting experiments, and solving mathematical problems	Discussions and evaluation of practical results

		Applying these concepts in the design and analysis of pharmaceutical formulations			
٣–٢	٤	Understanding methods of expressing solution concentration Knowing percentages, molarity, molality, and parts per million (ppm) Using accurate concentrations in drug preparation	Expression of concentrations in pharmaceutical preparations	Using the smart board, conducting experiments, and solving mathematical problems	Discussions and evaluation of practical results
٥–٤	٤	Understanding the formation of a system from two liquid substances Knowing the solubility of each component in the other Studying liquid phase equilibrium Applications in the preparation of pharmaceutical solutions and dispersed formulations	Two-component systems containing liquid phases	Using the smart board, conducting experiments, and solving mathematical problems	Discussions and evaluation of practical results
٧–٦	٤	Understanding the equilibrium of three-component systems	Three-component systems	Using the smart board, conducting	Discussions and evaluation of practical results

		Studying the interactions of components and their effects on phases Applications in the design of complex pharmaceutical solutions and formulations		experiments, and solving mathematical problems	
٩–٨	٤	Understanding the tie line in three-component systems It illustrates the distribution of components between two equilibrium liquid phases It helps in determining the concentration of each component in the different phases	Tie linear for three-component systems	Using the smart board, conducting experiments, and solving mathematical problems	Discussions and evaluation of practical results
١٠	٢	Understanding the partition coefficient between two immiscible solvents Knowing the methods for its measurement and evaluation Using it to estimate drug solubility, absorption, and distribution in the body	Partition coefficient: Measurements and evaluation	Using the smart board, conducting experiments, and solving mathematical problems	Discussions and evaluation of practical results

١٢–١١	٤	Knowing methods to increase the solubility of pharmaceutical substances Understanding factors affecting solubility, such as temperature and solvent Applying these methods to improve drug absorption and stability	**Solubility methods**	Using the smart board, conducting experiments, and solving mathematical problems	Discussions and evaluation of practical results
١٤–١٣	٤	Understanding the mechanism of buffered solutions Knowing how to calculate pH and buffer capacity Applying them in drugs and biological systems to maintain stability	Buffer solutions	Using the smart board, conducting experiments, and solving mathematical problems	Discussions and evaluation of practical results
١٥	٢	Understanding the concept of solubility product (Ksp) for sparingly soluble salts Knowing methods to measure and determine Ksp Applying it to estimate salt solubility and control ion concentrations	Determinati on of solubility product constant of slightly soluble salts	Using the smart board, conducting experiments, and solving mathematical problems	Discussions and evaluation of practical results

56. Course Evaluation	
20 marks for theory (midterm exam + daily exams) + 20 marks for practical 60 marks for the final exam (theory only) Total: 100 marks	
57. Learning and Teaching Resources	
Required textbooks (curricular books any)	Martin´s physical pharmacy and pharmaceutical sciences, Patrick J. Sinko . Wolters Kluwer. Lippincott Williams &Wilkins. Philadelphia. 2011. Lab manual for physical pharmacy adopted by the department
Main references (sources)	
Recommended books and references (scientific journals, reports...)	

Course Description Form

54. Course Name:
Physiology I
55. Course Code:
56. Semester / Year:
First Semester – Second Stage– 2025–2026
57. Description Preparation Date:
1–2–2026
58. Available Attendance Forms:
Attendance
59. Number of Credit Hours (Total) / Number of Units (Total)
Total Hours: 75 hours Total Credits: 4 credits
60. Course administrator's name (mention all, if more than one name)
Dr. Atheer Khudair Hamad atheerspace@gmail.com Asst. Lect. Alaa Mohsen Ali alaa.mohsen@gu.edu.iq
61. Course Objectives
Enabling the student to understand the physiology and function of the cell Enabling the student to understand the physiology of the body and the functions of its various organs Providing a comprehensive description of the physiology of the body’s different systems
62. Teaching and Learning Strategies

For lectures, conducting practical experiments, reading textbooks, engaging in scientific discussions, and perform laboratory experiments					
63. Course Structure (theory)					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	information about Cell composition	**Introduction to cell physiology**	Lectures	Oral tests + homework
2	3	Body cells and Cell membrane, Ion channels	**The general and cellular basis of medical physiology**	Lectures	Oral tests + homework
3	3	**Properties of mixed nerves; glia; neurotrophins**	**Physiology of the nervous system and muscles,** Nerve cells; excitation and conduction;	Lectures	Oral tests + homework
4	3	**Nerve functions** Graded potentials, action potential	**Nerve fiber types**	Lectures	Oral tests + homework
5	3	**Smooth muscle; cardiac muscle**	**Muscles:** Skeletal muscle; contraction	Lectures	Oral tests + homework
6	3	**Alert behavior, sleep and electrical activity of the brain; control of posture and Movement**	**Synaptic transmission:** Reflexes, Cutaneous, deep, and visceral sensations	Lectures	Oral tests + homework
7	3	**The autonomic nervous system**	**Higher function of the nervous system:** central regulation of visceral function	Lectures	Oral tests + homework
8	3	**Surfactants; differences in ventilation and blood flow in deferent parts of**	**Respiration:** Respiratory zones; Mechanics of respiration; air volumes; respiratory muscles;	Lectures	Oral tests + homework

		the lung	compliance of the lungs and chest wall		
9	3	Gas transport between the lungs and tissue.	**Respiration:** Respiratory zones; Mechanics of respiration; air volumes; respiratory muscles; compliance of the lungs and chest wall	Lectures	Oral tests + homework
10	3	**Respiratory adjustment** in health and disease; Effect of exercise;	**Respiration:** Dead space and uneven ventilation; Pulmonary circulation: Pressure, volume and flow	Lectures	Oral tests + homework
11	3	**Renal physiology**: Introduction; innervations of the renal vessels; renal clearance; renal blood flow**.**	**Regulation of respiration:** Neural control of breathing; Respiratory centers; Regulation of respiratory	Lectures	Oral tests + homework
12	3	**Filtration fraction**: Reabsorption of Na^+, Cl^- and glucose. Tubular glomerular feedback and glomerulo tubular balance; water excretion in proximal tubules; loop of Henle; distal tubules; collecting ducts.	**Glomerular filtration rate (GFR)**: Measurements; factor affecting GFR	Lectures	Oral tests + homework
13	3	**Acidification of the urine:** H^+ secretion; reaction with buffers; ammonia secretion; factors affecting acid secretion.	**The counter current mechanism**; role of urea; water diuresis and osmotic dieresis**.**	Lectures	Oral tests + homework

14	3	**Cardiovascular:** origin and spread of cardiac excitation.	**Bicarbonate execration**; regulation of Na^+, K^+ and Cl^- excretion; uremia; acidosis. micturition	Lectures	Oral tests + homework
15	3	**Electrographic** findings in cardiac diseases; mechanical events of the cardiac cycle	**Cardiac output**	Lectures	Oral tests + homework

1. Course description (practical)

week	hours	Unit name	Learning method	Evaluation
١	٢	**Introduction to the physiology**	introduction	Various Tests
٢	٢	**Protein synthesis**	Learning the processes of protein synthesis in the cell and their regulations	Various Tests
٣	٢	**Tissue types in human body. Intercellular Communication**	Learning the communication between cells	Various Tests
٤	٢	**Action potential**	Learning the generation of action potential and its regulations	Various Tests
٥	٢	**Excitable tissue: Muscle cell**	Learning the function of muscles and their regulations	Various Tests
٦	٢	**Function of liver**	Learning the function of liver	Various Tests
7	٢	Function of liver	Learning the function of live	Various Tests
8	٢	**GIT motility**	Learning control of GIT muscle	Various Tests
9	٢	**Urinary System**	Learning the function of urinary organs	Various Tests
١٠	٢	**Seminars Nervous tissue**	Learning the function of nervous system	Various Tests
١١	٢	**Seminars Skeletal muscle**	Learning the function of voluntary muscles	Various Tests
١٢	٢	**Seminars cardiac tissue**	the function of cardiac muscles	Various Tests
١٣	٢	**Seminars respiratory system**	the function of respiratory muscles and respiratory organs	Various Tests

١٥-١٤	٤	**Seminars urinary system**	Learning the function of kidneys and body hemostasis	Various Tests

2. Course Evaluation

20 marks for theory (midterm exam + daily exams) + 20 marks for practical

60 marks for the final exam (theory only)

Total: 100 marks

3. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Textbook of Medical Physiology by Guyton AC; latest editi Review of Medical Physiology; Ganong W.F (Ed.), Latest edition.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	1.Vander Human Physiology: The Mechanisms of body function. Latest edition. 2. Review of Medical Physiology by Ganong W.F. Latest edition.
Electronic References, Websites	

Course Description Form

1. Course Name: *Physiology II*
2. Course Code:
3. Semester / Year:
Second Semester – Second Stage– 2025–2026
4. Description Preparation Date:
1–2–2026
5. Available Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
Total Hours: ٧٥ hours Total Credits: ٤ credits
7. Course administrator's name (mention all, if more than one name)
Dr. Atheer Khudair Hamad atheerspace@gmail.com Asst. Lect. Alaa Mohsen Ali alaa.mohsen@gu.edu.iq
8. Course Objectives
Enabling the student to understand the physiology and function of the cell

Enabling the student to understand the physiology of the body and the functions of its various organs

Providing a comprehensive description of the physiology of the body's different systems

9. Teaching and Learning Strategies

Lectures
Conducting practical experiments
Reading textbooks
Engaging in scientific discussions

Performing laboratory experiments

Reading textbooks

10. Course Structure (theory)

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 & 2			Digestive system Gastrointestinal function: function of stomach, small intestine, pancreas, liver, purpose of GI motility, large intestine, water absorption. Digestion and absorption of carbohydrates, proteins, fats, absorption of vitamins and minerals. Regulation of GIT basic principles: neural regulation, hormonal regulation, Phases of Gastrointestinal Control. Fatty acids and lipids; fatty acid oxidation and synthesis; ketone bodies; cellular lipids; transport of lipids in blood; free fatty acid metabolism; cholesterol metabolism; essential fatty acids; eicosanoids.		
3 & 4					

Specific contractile and secretory processes that occur in each segment of the GIT:

Mouth, Pharynx, and Esophagus (Chewing, salivation, swallowing)

The stomach: anatomy, HCl Production and secretion, pepsin secretion, stimulation of pepsin, function of pepsin.

Gastric Motility: frequency and force of contraction.

Pancreatic Secretions: bicarbonate, enzymes, control of secretions.

Bile secretion, bile function.

Small intestine: anatomy, function, secretion, absorption, and motility.

Large intestine: anatomy, function, secretion and motility.

Pathophysiology of the GIT: Ulcers, vomiting, dehydrations, gallstones, constipation and diarrhea.

5, 6 & 7

Endocrine and reproductive physiology

General function or role of endocrine system, hormones (definition and classification), hormone secretion, hormone transport and clearance from the blood.

Mechanisms of Action of Hormones: Hormone Receptors and Their Activation

Hypothalamic regulation of hormonal functions: Hypothalamus maintains body homeostasis, anatomy of the hypothalamus, relation to the pituitary gland "hypophysis", signals to the hypothalamus (thirst).

Control of Posterior Pituitary Secretion (Vasopressin & Oxytocin), functions of vasopressin and oxytocin, Control of anterior pituitary hormones secretion. Cell types in the anterior pituitary.

Growth "somatotropic or somatotropin" hormone: physiological functions of GH, regulation of GH secretion.

Thyroid metabolic hormones: Anatomy of thyroid gland, function of thyroid gland, synthesis and secretion of the thyroid metabolic hormones, Physiologic microanatomy of the thyroid gland, synthesis of metabolic thyroid hormones, transport of thyroxin and T3 to tissues.

8 & 9

Physiological Functions of the Thyroid Hormones: genomic and non-genomic effects, Regulation of TH Secretion, Diseases of the Thyroid.

Adrenocortical Hormones: Hormones of adrenal cortex (Mineralocorticoids and Glucocorticoids).

Functions and regulation of the Mineralocorticoids and Aldosterone hormones

Pancreatic Hormone Physiology: Anatomy of pancreas, Hormones of the pancreas.

Insulin: synthesis of insulin, metabolism and secretion, action of insulin.

Glucose: Glucose transporters, diabetes mellitus (DM).

Glucagon: Stimulants of secretion, inhibitors of secretion, Action of glucagon.

Somatostatin (SIH)

Somatotropin “STH” (growth hormone “GH”)

10 & 11

Blood physiology

Function and composition, plasma, hemopoiesis, bone marrow, regulation of hemopoiesis.

Red blood cells: Erythropoiesis, regulation of erythropoiesis.

Hemoglobin (function, synthesis, destruction), anemia, red cell indices (MCV, MCHC, MCH), polycythemia.

White blood cells: Leukopoiesis, granulocytes & monocytes, diapedesis, phagocytosis,

inflammation, immune mechanism & role of lymphocytes.

Blood types (blood groups): genetic determination of agglutinogens, blood tying, the Rh system, transfusion reactions.

Platelets: origin, structure & function, hemostasis and blood coagulation, clotting mechanisms, clot retraction, hemostatic control mechanism.

12 & 13

Blood disorders: Anemia, sickle cell disease, hemophilia, leukemia. Stem cell transplant.

Immunity

Innate immunity - first line (skin, nose, saliva, stomach, urine) - second line of defense (antimicrobial substances, natural killer cells and phagocytosis, microbial evasion of phagocytosis, phases of phagocytosis, inflammation, Abscess and ulcers.

Adaptive immunity: maturation of T-lymphocytes and B-lymphocytes, cell mediated immunity and humoral immunity, clonal selection, antigen and antigen receptors, diversity of antigen receptors, major histocompatibility complex antigen, pathways of antigen processing.

14 & 15

Activation of T-lymphocytes, activation and clonal selection of T-helper cells, activation and clonal selection of cytotoxic T-cells, elimination of invaders, immunological surveillance.

Antibody mediated (humoral) immunity: Activation and clonal selection of B-cells, antibodies (structure and action), role of complement system in immunity, immunological memory, self-recognition and self-tolerance.

11. Course Structure (practical)

Week	
1.	Hemoglobin estimation
2.	Packed cell volume
3.	RBC count
4.	ABO test
5.	WBC count
6.	Platelets count
7.	Bleeding time &clotting time
8.	Erythrocyte sedimentation rate
9.	Seminars Cardio vascular system
10.	Seminars Digestive system
11.	Seminars nervous system
12.	Seminars skeletal muscle
13.	Seminars immune system
14.	Seminars hematopoietic system
	Final exam

12. Course Evaluation

20 marks for theory (midterm exam + daily exams) + 20 marks for practical

60 marks for the final exam (theory only)

Total: 100 marks

13. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Review of Medical Physiology; Ganong W.F (E Latest edition
Main references (sources)	
Recommended books and references (scientific journals, reports…)	1.Vander Human Physiology: The Mechanism body function. Latest edition. 2. Review of Medical Physiology by Ganong W Latest edition.
Electronic References, Websites	

Course Description Form

13. Course Name:
Biochemistry I
14. Course Code:
15. Semester / Year:
First Semester – Third Year – 2025–2026
16. Description Preparation Date:
٢٠٢٦-٢-١
17.Available Attendance Forms:
Attendance
18. Number of Credit Hours (Total) / Number of Units (Total)
Total Hours: 75 hours Total Credits: 4 credits
19. Course administrator's name (mention all, if more than one name)
Ass. Prof. Dr. Ali Mohammed Ali Hussein Al-Nuaimi ali.m.alnuaimi@gu.edu.iq Dr. Aseel Salah Mansour dr.aseel.salah21@gmail.com Lecturer Hiba Mushtaq Ahmed hiba.m.ahmed@gu.edu.iq
20. Course Objectives

Course Objectives	Providing students with the principles of biochemistry related to important biomolecules and preparing them to discuss the metabolism of these molecules. Providing students with the necessary technical skills in the field of biochemistry.

21. Teaching and Learning Strategies

Strategy	1. Discussion and Opinion Exchange: • Use surveys or discussions to assess students' prior knowledge in topics related to biochemistry. • Connect new concepts with prior knowledge to enhance students' understanding. 2. Interactive Learning: • Conduct practical experiments or simulations to illustrate biochemical concepts.

	3. Utilizing Technology: • Depend on technological tools such as interactive presentations and digital simulations. 4. Motivation and Curiosity Stimulation: • Engage students in research projects or presentations on specific topics to stimulate curiosity. 5. Collaborative Work: • Encourage students to work collaboratively through group projects or group discussions. 6. Continuous Assessment: • Implement diverse assessment techniques such as written tests, practical projects, and oral performances. 7. Focus on Critical Thinking: • Encourage students to engage in critical thinking and analyze biochemical concepts.

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
١	٣	Understanding what biochemistry studies	Familiarity with what biochemistry studies	Lectures	Daily Quiz + Homework Assignments
٢	٣	Understanding Amino Acids: their structure, classification, properties, and forms.	Amino Acids: Structure, classification, properties, and forms of amino acids.	Lectures	Daily Quiz + Homework Assignments
٣	٣	Understanding chemical reactions of amino acids, zwitterions, isoelectric pH, non-proteogenic	Chemical reactions, zwitterion, isoelectric pH, non-proteogenic amino acids, and clinical importance	Lectures	Daily Quiz + Homework Assignments

		amino acids, and their clinical significance.			
٤	٣	Understanding the peptide bond, and the structure and function of some important peptides in humans.	Peptide bond, structure and function of some important peptides in human	Lectures	Daily Quiz + Homework Assignments
٥	٣	Understanding the order of protein structure and the bonds present in proteins at different structural levels.	Order of protein structure, bonds in proteins of different order of structure	Lectures	Daily Quiz + Homework Assignments
٦	٣	Understanding the determination of the amino acid sequence in primary structure proteins.	Determination of the amino acids sequence in primary order proteins,	Lectures	Daily Quiz + Homework Assignments
٧	٣	Understanding the determination of the N-	Determination of the N and C termini.	Lectures	Daily Quiz + Homework Assignments

		terminal and C-terminal of proteins			
٨	٣	Understanding the chemistry and classification of carbohydrates and fats, their clinical importance, and the classification of saturated and unsaturated fatty acids.	Chemistry, classification of carbohyd Clinical importance and classification, saturated and unsaturated fatty acids rates	Lectures	Daily Quiz + Homework Assignments
٩	٣	Understanding the clinical importance and classification of fatty acids, including saturated and unsaturated fatty acids.	Clinical importance and classification, saturated and unsaturated fatty acids	Lectures	Daily Quiz + Homework Assignments
١٠	٣	Understanding the structure, nomenclature, and classification of enzymes.	Enzymes structure, nomenclature, and classification		Daily Quiz + Homework Assignments

١١	٣	Understanding the general principles and factors affecting the rate of enzyme-catalyzed reactions.	General principles, factors affecting the rate of enzyme catalyzed reaction	Lectures	Daily Quiz + Homework Assignments
١٢	٣	Understanding competitive and noncompetitive inhibitors, and irreversible enzyme inhibition	The competitive and noncompetitive inhibitors, irreversible inhibition	Lectures	Daily Quiz + Homework Assignments
١٣	٣	Understanding the ideal enzyme-catalyzed step for regulation of a metabolic pathway.	The ideal enzyme-catalyzed step for regulation of a metabolic pathway,	Lectures	Daily Quiz + Homework Assignments
١٤	٣	Understanding the basic principles of endocrine hormone action.	The basic principles of endocrine hormone action	Lectures	Daily Quiz + Homework Assignments
١٥	٣	Understanding the roles of stimulus, hormone	The roles of stimulus, hormone release, signal generation, and response	Lectures	Daily Quiz + Homework Assignments

		release, signal generation, and response			

No.	**Lab title**	**Hours**
1	Effects of acids on carbohydrates: Molish test; Bials test; Anthron test; Seliwanoffs test; Mucic acid test.	2
2	Classification of carbohydrates according to reducing properties: Benedicts test; Fehlings test; Barfoed test.	2
3	Classification of carbohydrates according to reducing properties: Iodine test; Ozasone test.	2
4	Determination of unknown carbohydrates sample.	2
5	Color reactions of proteins: Biuret test; Ninhydrin test	2
6	Color reactions of proteins: Millons test; Hopkins-Cole test; unoxidized sulfur test.	2
7	Solubility of proteins (effects of acid, neutral salts, heavy metals, and alkaloidal reagents).	2
8	Determination of unknown sample of proteins.	2
9	Experiments on solubility of lipids.	2
10	Acrolin test for lipids; Soap; Studying properties of soap.	2
11	Determination of saponification number.	2
12	Properties of lipids: Iodine test for lipids.	2
13	Properties of enzymes: Effects of heat on enzymes.	2
14	Properties of enzymes: Effect of concentration of enzyme (salivary amylase) on reaction velocity	2
15	Properties of enzymes: Effect of pH on enzymatic activity.	2

Course Evaluation 20 marks for theory (midterm exam + daily exams) + 20 marks for practical 60 marks for the final exam (theory only) Total: 100 marks

Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Harper's Illustrated Biochemistry, 32 ed.
Main references (sources)	Lippincott Illustrated Reviews: Biochemistry, 7th ed. Lehninger Principles of Biochemistry, 8th ed.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

13. Course Name:
Biochemistry II
14. Course Code:
15. Semester / Year:
Second Semester – Third Year – 2025–2026
16. Description Preparation Date:
٢٠٢٥-٢-١
17.Available Attendance Forms:
Attendance
18.Number of Credit Hours (Total) / Number of Units (Total)
Total Hours: 75 hours Total Credits: 4 credits
19. Course administrator's name (mention all, if more than one name)
Ass. Prof. Dr. Ali Mohammed Ali Hussein Al-Nuaimi ali.m.alnuaimi@gu.edu.iq Dr. Aseel Salah Mansour dr.aseel.salah21@gmail.com Lecturer Hiba Mushtaq Ahmed hiba.m.ahmed@gu.edu.iq
20. Course Objectives

Course Objectives	1) Learning of the fundamentals of cellular metabolism of carbohydrates, lipids, and amino acids and their association with various metabolic diseases 2) Providing students with the necessary technical skills in the field of biochemistry.
21. Teaching and Learning Strategies	
Strategy	Lectures – Practical – Quizes – Reports

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	3	To understand	Bioenergetics: The Role of ATP	lectures + smart board	Exam
2	3	To understand	The Respiratory Chain and Oxidative Phosphorylation	lectures + smart board	Exam
3	3	To understand	Overview of Metabolism and the Provision of Metabolic Fuels	lectures + smart board	Exam
4	3	To understand	The Citric Acid Cycle	lectures + smart board	Exam
5	3	To understand	Glycolysis and the Oxidation of Pyruvate	lectures + smart board	Exam
6	3	To understand	Metabolism of Glycogen	lectures + smart board	Exam
7	3	To understand	Gluconeogenesis and the Control of Blood Glucose	lectures + smart board	Exam
8	3	To understand	The Pentose Phosphate Pathway and Other Pathways of Hexose Metabolism	lectures + smart board	Exam
9	3	To understand	Biosynthesis of Fatty Acids	lectures + smart board	Exam
10	3	To understand	Oxidation of Fatty Acids: Ketogenesis	lectures + smart board	Exam
11	3	To understand	Lipid Transport and Storage	lectures + smart board	Exam
12	3	To understand	Overview of Proteins and Amino Acids Metaolism Biosynthesis of the Nutritionally Nonessential Amino Acids	lectures + smart board	Exam
13	3	To understand	Catabolism of Proteins and of Amino Acid Nitrogen	lectures + smart board	Exam
14	3	To understand	Catabolism of the Carbon Skeletons of Amino Acids Conversion of Amino Acids to Specialized Products	lectures + smart board	Exam

15	3	To understand	Porphyrins and Bile pigments	lectures + smart board	Exam

Course description (practical)

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	2	The student learns the pathological condition according to its physical properties	General urine examination: Physical properties.	lectures and discussions Practical work Video presentation	Written and oral exams Report preparation Conducting sample analysis
2.	2	The student learns the pathological condition based on chemical properties, such as measuring protein levels in urine and blood sugar.	General urine examination: Chemical properties; Protein in urine; Sugar in urine.	lectures and discussions Practical work Video presentation	Written and oral exams Report preparation Conducting sample analysis
3.	2	The student learns to examine ketone bodies and bile salts and identify related diseases based on their colors.	General urine examination: Ketone bodies in	lectures and	

			urine (Rothera test); Bile salts in urine (Hays test); Bilirubin in urine.	discussions Practical work Video presentation	Written and oral exams Report preparation Conducting sample analysis
4.	2	Unknown urine sample test to identify possible diseases.	General urine examination: Evaluation of unknown urine sample	lectures and discussions Practical work Video presentation	Written and oral exams Report preparation Conducting sample analysis
5.	2	Learning how to collect cerebrospinal fluid and measure glucose levels in it	Cerebrospinal fluid analysis: Measurement of glucose in CSF.	lectures and discussions Practical work	Written and oral exams Report preparation Conducting sample analysis

				Video presentation	
6.	2	Learning how to collect cerebrospinal fluid and measure chloride levels in it	Cerebrospinal fluid analysis: Measurement of chloride in CSF.	lectures and discussions Practical work Video presentation	Written and oral exams Report preparation Conducting sample analysis
7.	2	Learning how to collect cerebrospinal fluid and measure protein levels in it	Cerebrospinal fluid analysis: Measurement of proteins in CSF.	lectures and discussions Practical work Video presentation	Written and oral exams Report preparation Conducting sample analysis
8.	2	Measuring calcium levels in the blood	Serum calcium measurement.	lectures and	Written and oral exams

				discussions Practical work Video presentation	Report preparation Conducting sample analysis
9.	2	Measuring salt levels, such as phosphorus, to identify related diseases, such as bile duct obstruction and kidney diseases	Blood phosphorus measurement (inorganic phosphate).	lectures and discussions Practical work Video presentation	Written and oral exams Report preparation Conducting sample analysis
10.	2	Measuring protein levels in the blood	Serum total proteins (quantitative analysis).	lectures and discussions Practical work	Written and oral exams Report preparation Conducting sample analysis

				Video presentation	
11.	2	Measuring blood urea levels to identify kidney diseases	Estimation of urea level in the blood.	lectures and discussions Practical work Video presentation	Written and oral exams Report preparation Conducting sample analysis
12.	2	Measuring uric acid levels in the blood to identify certain diseases, such as gout	Measurement of serum uric acid level.	lectures and discussions Practical work Video presentation	Written and oral exams Report preparation Conducting sample analysis
13.	2	Measuring ascorbic acid in the blood to determine blood acidity	Measurement of serum ascorbic acid level.	lectures and	Written and oral exams

				discussions Practical work Video presentation	Report preparation Conducting sample analysis
14.	2	Detecting the concentration of free hydrochloric acid due to its association with stomach diseases	Gastric juice analysis: Detection of free hydrochloric acid	lectures and discussions Practical work Video presentation	Written and oral exams Report preparation Conducting sample analysis
15.	2	Detecting the concentration of free hydrochloric acid due to its association with stomach diseases, and measuring the total acid level	Gastric juice analysis: detection of free acid, total acid content.	lectures and discussions Practical work	

				Video presentation	

Course Evaluation

٢٠ marks for theory (midterm exam + daily exams) + 20 marks for practical
60 marks for the final exam (theory only)
Total: 100 marks

24. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Harper's Illustrated Biochemistry, 32 ed.
Main references (sources)	*Lippincott Illustrated Reviews: Biochemistry, 7th ed.* *Lehninger Principles of Biochemistry, 8th ed.*
Recommended books and references (scientific journals, reports...)	

33. Course Name:

Inorganic Pharmaceutical Chemistry

34. Course Code:

35. Semester / Year:

First semester, Third stage-2025-2026

36. Description Preparation Date:

1-2-2026

37. Available Attendance Forms:

Attendance

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

Total Hours: 60 hours

Total Credits: 3 credits

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

Assist. Lecturer Hamza Fadhil Hamza

Hamza.fadhil@gu.edu.iq

Asst. Lect. Hadeel Hussein

Hadeel.h.hamza@gu.edu.iq

40. Course Objectives

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

41. Teaching and Learning Strategies

1. Lectures
2. Conducting experiments
3. Reading textbooks

Conducting scientific discussions

42. Course Structure (theoretical and practical)

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Understanding of Electron configuration, chemical properties, advantages and disadvantages of using Alkali metals	Alkali metals	Lecture	Quiz
2	3	Understanding of Electron configuration, chemical properties, advantages and disadvantages of using Alkaline earth metals	Alkaline Earth Metals	Lecture	Quiz
3-4	3	Understanding the chemistry of group 13	Group 13	Lecture	Quiz
5	3	Understanding the general chemistry of group 14 elements	The Carbon Group	Lecture	Quiz
6-7	3	Understanding the general chemistry of Transition Metals and d-Block Metal Chemistry	Transition Metals and d-Block Metal Chemistry	Lecture	Quiz
8	3	Understanding the chemistry of heavy-metal poisoning and chelation therapy	Chelation Therapy	Lecture	Quiz

9	3	Understanding the chemistry of Protective adsorbents	Protective adsorbents	Lecture	Quiz
10	3	Understanding the chemistry of Topical agents	Topical agents	Lecture	Quiz
11	3	Understanding the chemistry of Dental agents	Dental agents	Lecture	Quiz
12	3	Understanding the chemistry of Organometallic Chemistry	Organometallic Chemistry	Lecture	Quiz
13-14	3	Understanding the chemistry of radioactive Compounds and Their Clinical Application	Radioactive Compounds and Their Clinical Application	Lecture	Quiz
15	3	Understanding the chemistry of radiopharmaceuticals for imaging	Radiopharmaceuticals for imaging	Lecture	Quiz

1. Course description (practical)

week	hours	Unit name	Learning method	Evaluation
١	٢	Preparation and standardization of 1N HCl (known sample)	lectures + Conducting experiments	Daily exams and oral questions
٢	٢	Preparation and standardization of 1N HCl (quiz and unknown)	Conducting experiments	Daily exams and oral questions
٣	٢	Preparation and standardization of 1N 1NaOH (known sample)	lectures + Conducting experiments	Daily exams and oral questions
٤	٢	Preparation and standardization of 1N NaOH (quiz and unknown)	Conducting experiments	Daily exams and oral questions
٥	٢	Assay of NaOH solution (known sample)	lectures + Conducting experiments	Daily exams and oral questions
٦	٢	Assay of NaOH solution (unknown sample)	Conducting experiments	Daily exams and oral questions
7	٢	**Assay of sodium benzoate (known sample)**	lectures + Conducting experiments	Daily exams and oral questions
8	٢	Assay of sodium benzoate (quiz and unknown)	Conducting experiments	Daily exams and oral questions
9	٢	Assay of Borax (explanation of basic concepts)	lectures + Conducting experiments	Daily exams and oral questions
١٠	٢	Assay of Borax (quiz and unknown)	Conducting experiments	Daily exams and oral questions
١١	٢	Assay of citric acid (known sample)	lectures + Conducting experiments	Daily exams and oral questions
١٢	٢	Assay of citric acid (unknown sample)	Conducting experiments	Daily exams and oral questions

١٣	٢	Assay of magnesium hydroxide (known sample)	lectures + Conducting experiments	Daily exams and oral questions
١٤	٢	Assay of magnesium hydroxide (quiz and unknown)	Conducting experiments	Daily exams and oral questions
١٥	٢	Assay of ammoniated mercury (unknown sample)	Conducting experiments	Daily exams and oral questions

2. Course Evaluation

20 marks for theory (midterm exam + daily exams) + 20 marks for practical

60 marks for the final exam (theory only)

Total: 100 marks

3. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1-Essentials of Inorganic Chemistry For Students Pharmacy, Pharmaceutical Sciences and Medici Chemistry by KATJA A. STROHFELDT, School Pharmacy, University of Reading, UK 2-Inorganic Medicinal and Pharmaceutical Chemis by Block, Roche Soine and Wilson, latest edition. 3- Laboratory Handbook for Practical Inorga Pharmaceutical Chemistry adopted by the departme
Main references (sources)	
Recommended books and references (scientific journals, reports…)	Google Scholar
Electronic References, Websites	Google Scholar

Course Description Form

1. Course Name:
Organic Pharmaceutical Chemistry I
2. Course Code:
3. Semester / Year:
Second semester, Third stage2025-2026
4. Description Preparation Date:
1-2-2026
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
Total Hours: 60 hours **Total Credits: 3 credits**
7. Course administrator's name (mention all, if more than one name)
Assist. Lecturer Hamza Fadhil Hamza

Hamza.fadhil@gu.edu.iq
Assist. Lecturer Hadeel Hussein Hamza
hadeel.h.hamza@gu.edu.iq

8. Course Objectives

This course provides a comprehensive overview of the core principles governing how drugs interact with the human body, from metabolism and distribution to receptor binding and therapeutic action.

The curriculum is structured to first explain what the body does to a drug (pharmacokinetics), then detail the principles of rational drug design (pharmacodynamics).

9. Teaching and Learning Strategies

1. **Lectures**
2. **Conducting experiments**
3. **Reading textbooks**

Conducting scientific discussions

10. Course Structure (theoretical and practical)

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Understanding the drug distribution	Drug distribution	Lecture	Quiz
1-2	3	Understanding the acid -base properties of drug	Acid -base properties	Lecture	Quiz
2	3	Understanding the Statistical prediction of pharmacological activity	Statistical prediction of pharmacological activity	Lecture	Quiz
3	3	Understanding the QSAR models	QSAR models	Lecture	Quiz
3-4	3	Understanding the drug receptor interaction: forces involved	Drug receptor interaction: forces involved	Lecture	Quiz
4	3	Understanding the Steric features of drugs	Steric features of drugs	Lecture	Quiz
5	3	Understanding the isosterism ,Optical	Isosterism ,Optical	Lecture	Quiz

		isomerism and biological activity	**isomerism and biological activity**		
6-8	**3**	**Understanding the concept, chemistry, and strategies of prodrug.**	**Prodrug**	**Lecture**	**Quiz**
8-14	**3**	**Understanding the general pathways of drug metabolism**	**Drug Metabolism**	**Lecture**	**Quiz**
15	**3**	**Factors affecting drug metabolism**	**Drug Metabolism**	**Lecture**	**Quiz**

Practical

Organic Pharmaceutical Chemistry - I

No.	Lecture title	Hours
1.	Preparation and standardization of 0.1N $KMnO_4$ (known sample)	2
2.	Preparation and standardization of 0.1N $KMno_4$ (quiz and unknown)	2
3.	Assay of hydrogen peroxide solution (known sample)	2
4.	Assay of hydrogen peroxide solution (quiz and unknown sample)	2
5.	Assay of ferrous sulfate (known sample)	2
6.	Assay of ferrous sulfate (unknown sample)	2
7.	Preparation and standardization of 0.1$Na_2S_2O_4$ solution (known sample)	2
8.	Preparation and standardization of 0.1$Na_2S_2O_4$ solution (quiz and unknown sample)	2
9.	Assay of copper sulfate (known sample)	2
10.	Assay of copper sulfate (unknown sample)	2
11.	Assay of Chlorinated Lime (known sample)	2
12.	Assay of Chlorinated Lime (quiz and unknown)	2
13.	Preparation and assay of Lugol's Solution (known sample)	2
14.	Preparation and assay of Lugol's Solution (quiz and unknown)	2
15.	Assay of Alum (unknown sample)	2

Reference text

Laboratory Handbook for Practical Pharmaceutical Chemistry adopted by the department.

11. Course Evaluation	
20 marks for theory (midterm exam + daily exams) + 20 marks for practical **60 marks for the final exam (theory only)** **Total: 100 marks**	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	**1) Wilson and Gisvolds textbook of organic medicinal and pharmaceutical chemistry, John M. B.; John H.B. (twelfth edition).** **2) An Introduction to Medicinal Chemistry 5th Edition by Graham L. Patrick, University of the West of Scotland, UK**
Main references (sources)	
Recommended books and references (scientific journals, reports...)	**Google Scholar**

Practical					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
١	٢	Preparing a 0.1N potassium permanganate solution accurately Understanding why $KMnO_4$ is not considered a primary standard Performing standardization using a known primary standard	Preparation and standardization of 0.1N KMnO4 (known sample)	Delivering lectures and conducting experiments	Daily exams and oral questions

		Applying titration principles and calculating the accurate normality of the solution Developing laboratory skills and measurement accuracy			
٢	٢	Practically preparing a 0.1N $KMnO_4$ solution Standardizing the solution using an unknown sample Accurately calculating the actual normality Assessing the student's skills in titration and calculations Verifying the accuracy of the results practically	Preparation and standardization of 0.1N KMno4 (quiz and unknown	Preparing and measuring the concentration of an unknown	Daily exams and oral questions
٣	٢	Accurately determining the concentration of hydrogen peroxide Applying the redox titration method Using a known standard solution for estimation Performing correct calculations to	Assay of hydrogen peroxide solution (known sample)	Delivering lectures and conducting experiments	Daily exams and oral questions

		determine the percentage Enhancing accuracy and laboratory skills			
٤	٢	Estimating the concentration of hydrogen peroxide in an unknown sample Practically applying redox titration Accurately calculating the concentration from titration results Assessing the student's skills in analysis and calculations Verifying the accuracy and correctness of the results	Assay of hydrogen peroxide solution (quiz and unknown sample)	Preparing and measuring the concentration of an unknown	Daily exams and oral questions
٥	٢	Accurately determining the percentage of Fe^{2+} in the standard sample Applying redox titration (usually with $KMnO_4$) Calculating purity/concentration and comparing it with the theoretical value	Assay of ferrous sulfate (known sample)	Delivering lectures and conducting experiments	Daily exams and oral questions

		Following laboratory procedures and safety measures			
٦	٢	Estimating the concentration of Fe^{2+} in the unknown sample Performing redox titration accurately Calculating purity/standard from the titration results Evaluating the accuracy of results and possible sources of error	Assay of ferrous sulfate (unknown sample)	Preparing and measuring the concentration of an unknown	Daily exams and oral questions
٧	٢	Preparing a 0.1 N $Na_2S_2O_4$ solution correctly Performing standardization using a known primary standard Accurately calculating the actual normality Maintaining laboratory accuracy and safety during preparation and standardization	**Preparation and standardization of 0.1Na2S2O4 solution (known sample)**	Delivering lectures and conducting experiments	Daily exams and oral questions
٨	٢	Accurately preparing a 0.1 N $Na_2S_2O_4$ solution Standardizing the solution using an	Preparation and standardization of 0.1Na2S2O4 solution (quiz	Preparing and measuring the concentration	Daily exams and oral questions

		unknown sample/method Calculating the true normality from the titration results Assessing accuracy and possible sources of error in the results	and unknown sample)	of an unknown	
٩	٢	Determining the concentration of Cu^{2+} in the standard sample Accurately applying the appropriate titration method Calculating purity/standard and comparing it with the theoretical value Maintaining laboratory accuracy and safety	Assay of copper sulfate (known sample	Delivering lectures and conducting experiments	Daily exams and oral questions
١٠	٢	Estimating the concentration of Cu^{2+} in the unknown sample Performing the analytical titration accurately Calculating purity/standard from the titration results Evaluating the accuracy of results and	Assay of copper sulfate (unknown sample)	Preparing and measuring the concentration of an unknown	Daily exams and oral questions

		possible sources of error			
١١	٢	Determining the available chlorine content in the standard sample Accurately using the appropriate chemical titration Calculating purity/standard and comparing it with the theoretical value Maintaining laboratory accuracy and safety procedures	Assay of Chlorinated Lime (known sample	Delivering lectures and conducting experiments	Daily exams and oral questions
١٢	٢	Determining the available chlorine content in the standard sample Accurately applying the appropriate chemical titration Calculating purity/standard and comparing it with the theoretical value Adhering to laboratory accuracy and safety procedures	Assay of Chlorinated Lime (quiz and unknown	Preparing and measuring the concentration of an unknown	Daily exams and oral questions
١٣	٢	Accurately preparing a Lugol's solution	Preparation and assay of Lugol's	Delivering lectures and	Daily exams and oral questions

		Determining the I_2 concentration in the standard sample Performing the appropriate titration and calculating the true normality Adhering to laboratory safety and measurement accuracy	Solution (known sample	conducting experiments	
١٤	٢	Accurately preparing a Lugol's solution Estimating the I_2 concentration in an unknown sample Performing the titration and calculating the actual normality Evaluating accuracy and possible laboratory sources of error	Preparation and assay of Lugol's Solution (quiz and unknown	Preparing and measuring the concentration of an unknown	Daily exams and oral questions
١٥	٢	Estimating the Al^{3+} content in the unknown sample Accurately performing the appropriate analytical titration Calculating purity/standard from the titration results	Assay of Alum (unknown sample)	Preparing and measuring the concentration of an unknown	Daily exams and oral questions

		Evaluating accuracy and possible sources of error			

13. Course Evaluation	
20 marks for theory (midterm exam + daily exams) + 20 marks for practical 60 marks for the final exam (theory only) Total: 100 marks	
14. Learning and Teaching Resources	
Required textbooks (curricular book any)	1) Wilson and Gisvolds textbook of organic medicinal and pharmaceutical chemistry, John M. B.; John H.B. (twelfth edition). 2) An Introduction to Medicinal Chemistry 5th Edition by Graham L. Patrick, University of the West of Scotland, UK
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Google Scholar

Course Description Form

13. Course Name:
Pharmacognosy II
14. Course Code:
15. Semester / Year:
First course /Third stage2025-2026
16. Description Preparation Date:
1-2-2025-206
17.Available Attendance Forms:
Attendance
18.Number of Credit Hours (Total) / Number of Units (Total)
Total Hours: 60 hours Total Credits: 3 credits
19. Course administrator's name (mention all, if more than one name)
Asst. Lect. Rasha Abdul Ridha Khalaf Rasha.a.khalaf@guc.edu.iq Pharmacist Hussein Abdul Kareem
20. Course Objectives

Course objectives: The first course includes an introduction the biological compositions of the biological materials form in primary and secondary plants, in addition to knowing t types of carbohydrates, glycosides, volatile and fixed o resins vitamins, and amino acids, in addition to studying t plant families of these types.	• Knowing the types of plan specific to each type..... • Knowing how to extract th active ingredient..... • Knowing the benefits and reasons for using plants for each type..

21. Teaching and Learning Strategies

Strategy	-Using modern methods in presenting lectures in the form of slides - Video clips and explanatory diagrams - Visiting the medicinal plants garden and submitting scientific repo - Monitoring students' attendance
	- Asking questions during the lecture - Conducting surprise oral and written exams - Conducting extracurricular activities

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introduction to Medicinal Plants and Bioactive Components Medicinal Plants	Introduction:General biosynthesis thwaysof secondary metabolites		

	3	carbohydrates	carbohydrates	Deliver g lectur and discuss ns in person, carryin out practic experi nts	Discuss ns, conduc g evaluat ns of t theoret al a practic aspects conduc g surpr exams, activiti and homew k.
3&4	6	Glycosides :biosynthesis, physical and Chemicalproperties ;cardiacglycosides ;saponinglycosides ;antheroquonone glycosides;flavonoid glycosidescyanophore glycosides	Glycosides :biosynthe physical and Chemicalproperties ;cardiacglycosides ;saponinglycosides ;antheroquonone glycosides;flavonoid glycosidescyanophore glycosides		
5&6 &7	9	Isothiocyanate glycosides;aldehyde,alcoh c,phenolic, lactone coumarines& chromones glycosides	Isothiocyanate glycosides;aldehyde,alcoho phenolic, lacto coumarines& chromo glycosides		
8	3	Resins &resin combination	Resins &resin combination		

9&10	6	Lipids:fixed oils &waxes	Lipids:fixed oils &waxes		
11 &12	6	Volatile oils :introduction ,chemistry of volatile oils ,biosynthesis of volatile l ,hydrocarbons as volatile , oils alcohols as volatile oils aldehydes as volatile oils	latile oils :introduction emistry of volatile oils ,biosynthesis of volatile ,hydrocarbons as volatile , oils alcohols as volatile o aldehydes as volatile oils		
13	3	Ketones ,phenols oxides, ,ester phenolic ethers as volatile oils	tones ,phenols oxides, ,ester phenolic ethers as volat oils		
14	3	Non- medicinal toxic plant	Non- medicinal toxic plants		
15	3	Vitamins &amino acids	Vitamins &amino acids		

Course description (practical)

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1.	4	Gastric juice analysis: Detection of free hydrochloric acid concentration.	lab	Quiz	
2.	4	Gastric juice analysis: detection of free acid, total acid content.	lab	Quiz	
3.	4	Cardio-active glycosides	lab	Quiz	
4.	4	Anthraquinone glycosides	lab	Quiz	
5.	3	Saponin glycosides.	lab	Quiz	
6.	4	Tannins.	lab	Quiz	
7.	3	Volatile oils	lab	Quiz	
8.	4	Flavonoid glycoside	lab	Quiz	

Course Evaluation

20 marks for theory (midterm exam + daily exams) + 20 marks for practical
60 marks for the final exam (theory only)
Total: 100 marks

24. Learning and Teaching Resources

Required textbooks (curricular books, if any)	• Trease and Evans Pharmacogno William Charles Evans, 16th ed. •Pharmacognosy by Var E- Tyler, 7th ed. •Fundimentals Pharmacognosy and Phytotherapy, Michael Heinrich, 2nd ed
Main references (sources)	Pharmacognosy by Varro- Tyler, 7th ed.
Recommended books and references (scientific journals, reports...)	Academic journals related to the topics of drugs and medicinal plants on the sites of Google Scholar, Wikipedia

Course Description Form

13. Course Name:	
Pharmacognosy III	
14. Course Code:	
15. Semester / Year:	
Second course /Third stage2025-2026	
16. Description Preparation Date:	
١-٢-٢٠٢٥-٢٠٢٦	
17.Available Attendance Forms:	
Attendance	
18.Number of Credit Hours (Total) / Number of Units (Total)	
Total Hours: 60 hours Total Credits: 3 credits	
19. Course administrator's name (mention all, if more than one name)	
Asst. Lect. Rasha Abdul Ridha Khalaf Rasha.a.khalaf@guc.edu.iq الصيدلاني مصطفى أحمد Pharmacist Mustafa Ahmed	
20. Course Objectives	
Course Objectives Course objectives: Study the alkaloids and plant families of these types, study the antibiotics ar Phytotherapy..	• Knowing the types of plants specific t each type..... • Knowing how to extract the active ingredient..... • •Knowing the benefits and reasons for using plants for each type.....
21. Teaching and Learning Strategies	

Strategy	-Using modern methods in presenting lectures in the form of slides -Video clips and explanatory diagrams -Visiting the medicinal plants garden and submitting scientif reports -Monitoring students' attendance -Asking questions during the lecture -Conducting surprise oral and written exams -Conducting extracurricular activities

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
١-٧	١٤	Understanding the sources of alkaloids, their types, and their therapeutic activities	Alkaloids	Attendance	Quizzes Homeworks
٨-١١	٨	Understanding natural antibiotics, their sources, and their benefits	Antibiotics	Attendance	Quizzes Homeworks
١٥-١٢	٨	Understanding the most important medicinal plants and their clinical applications	Phytotherapy	Attendance	Quizzes Homeworks

Course description (practical)

Week	Hours	Unit or subject name	Required Learning Outcomes	Learning method	Evaluation method
1.	4	Alkaloids piperine	scientific experiments	lab	Quiz
2.	4	Black pepper	scientific experiments	lab	Quiz
3.	4	Tropaine alkaloids	scientific experiments	lab	Quiz
4.	4	Indole alkaloids	scientific experiments	lab	Quiz
5.	4	Identification of Harmala alkaloids	scientific experiments	lab	Quiz
6.	4	Purine bases	scientific experiments	lab	Quiz
7.	3	Isoquinoline alkaloids	scientific experiments	lab	Quiz
8.	3	Citric acid	scientific experiments	lab	Quiz

Course Evaluation
20 marks for theory (midterm exam + daily exams) + 20 marks for practical
60 marks for the final exam (theory only)
Total: 100 marks

Course Description Form

1. Course Name:
Pharmaceutical Ethics
2. Course Code:
3. Semester / Year:
Second course /Third stage2025-2026
4. Description Preparation Date:
٢٠٢٦-٢٠٢٥-٢-١
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
Total hours: 15 Total credits: 1 credit
7. Course administrator's name (mention all, if more than one name)
Asst. Prof. Dr. Ali Mohammed Ali Hussein Al-Nuaimi ali.m.alnuaimi@gu.edu.iq .
8. Course Objectives
The course will provides an overview of ethical issues facing practicing pharmacists in order enable the student to understand the basic concepts of ethics which formulate the relationship pharmacist with the patient, colleges, and other health personnel in order to deliver pharmaceutical services in good way. The course will begin with an introduction to ethics in pharmaceutical practice and then proceed examine in depth specific topics (Beneficence, Autonomy, Confidentiality, Consent The course will include lectures, case analysis, and classroom discussion
9. Teaching and Learning Strategies
Lectures, Discussion sessions, Field trips, Workshops
10. Course Structure (theoretical and practical)

theoretical					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
١	٢	Identify the basic principles of pharmacy ethics. Understand the ethical relationship between the pharmacist, patients, colleagues, and other healthcare professionals. Apply ethical concepts in practical situations and classroom discussions.	Introduction to Pharmacy Ethics (Theoretical considerations)	lectures and discussions	Written and oral exams, and direct questions
٢	١	Identify the Code of Ethics for pharmacists. Understand the principles and professional behaviors required in pharmacy practice. Apply the Code of Ethics in practical and professional situations.	Code of Ethics for Pharmacists.	lectures and discussions	Written and oral exams, and direct questions
٣	٣	Identify common ethical considerations in pharmaceutical care practice.	Common Ethical Considerations in Pharmaceutical Care Practice	lectures and discussions	Written and oral exams, and direct questions

		Understand the principles of beneficence, autonomy, honesty, informed consent, confidentiality, and fidelity. Apply these ethical principles in practical situations with patients and colleagues.	(Beneficence, Autonomy, Honesty, Informed Consent, Confidentiality, Fidelity		
٤	٢	Identify the importance of interprofessional relationships in healthcare. Understand the pharmacist's role within a multidisciplinary healthcare team. Develop communication and collaboration skills with colleagues from different professions to provide effective pharmaceutical care.	Interprofessional Relations	lectures and discussions	Written and oral exams, and direct questions
٥	١	Identify the foundations of making ethical decisions in pharmacy.	Making ethical decisions	lectures and discussions	Written and oral exams, and direct questions

		Understand the steps for analyzing ethical situations and evaluating available options. Apply ethical principles to make responsible professional decisions in pharmacy practice.			
٦	١	Identify ethical issues related to clinical pharmacy research. Understand ethical principles for protecting the rights of research participants. Apply ethical standards in the design and conduct of pharmaceutical research studies.	Ethical issues related to clinical pharmacy research	lectures and discussions	Written and oral exams, and direct questions
٧	١	Identify ethical problems that may arise in the pharmacist's clinical practice. Understand how to handle complex ethical situations while providing pharmaceutical care.	Ethical problems in the pharmacist's clinical practice	lectures and discussions	Written and oral exams, and direct questions

		Apply responsible ethical decision-making when facing professional challenges.			
٨	١	Identify methods to prevent the misuse of medicines. Understand factors leading to medicine misuse and its effects on patients and society. Apply strategies to reduce medicine misuse in pharmacy practice.	Preventing misuse of medicines	lectures and discussions	Written and oral exams, and direct questions
٩	٣	Identify the use of case studies to understand ethical issues in pharmacy. Analyze different ethical situations and evaluate available options. Develop practical ethical decision-making skills in pharmacy practice.	Case studies in pharmacy ethics	lectures and discussions	Written and oral exams, and direct questions
Practical					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

11. Course Evaluation	
12. Learning and Teaching Resources	
Required textbooks (curricular boo if any)	1- Ruth Rodgers, (ed.); fast track: Law and Ethics in Pharmacy Practice. Pharmaceutical Press 2010. 2-Joy Wingfield and David Badcott . Pharmacy Ethics and Decision Making. Pharmaceutical Press2007 3-Robert J. Cipolle, Linda M. Strand, Peter C. Morley. Pharmaceutical Care Practice: The Clinician's Guide, 2nd Edition. 4- Robert m. Veatch and Amy Haddad. Case Studies in Pharmacy Ethics. second edition. Copyright © 2008 by Oxford University Press, Inc.
Main references (sources)	
Recommended books and references (scientific journals, reports...)	

Course Description Form

1. Course Name:
Pharmacology 1
2. Course Code:
3. Semester / Year:
Second course /Third stage2025-2026
4. Description Preparation Date:
١-٢-٢٠٢٥-٢٠٢٦
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
Total hours: 45 hours Total credits: 3 units
7. Course administrator's name (mention all, if more than one name)
Asst. Lecturer Zainab Khalid Zainab.k.ali@gu.edu.iq
8. Course Objectives
To introduce the pharmacy students to the basis of general pharmacology. The student will le about various body systems and drugs used to affect them in health and disease. Moreover course will cover the drugs used to treat microbial infections.
9. Teaching and Learning Strategies
Using the smart board Using presentation slides Requesting periodic reports
10. Course Structure (theoretical and practical)
theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
١	٣	Learning the routes of drug administration Absorption of drug Drug distribution Drug clearance through metabolism Drug clearance by the kidney Clearance by other routes	Pharmacokinetics	Lectures	daily exams + discussions questions and answers
٢	٣	Understanding signal transduction, dose–response relationships, intrinsic activity, and quantitative dose–response relationships.	Drug–Receptor Interactions and Pharmacodynamics	Lectures	daily exams + discussions questions and answers
٣	٣	Understanding an introduction to the nervous system and chemical signaling between cells.	The Autonomic Nervous System	Lectures	daily exams + discussions questions and answers
٤	٣	Understanding cholinergic receptors, direct-acting cholinergic agonists, reversible cholinesterase inhibitors, irreversible cholinesterase inhibitors, and cholinesterase inhibitor toxicity.	Cholinergic Agonists	Lectures	daily exams + discussions questions and answers
٥	٣	Understanding muscarinic receptor	Cholinergic Antagonists	Lectures	daily exams + discussions

		antagonists, ganglionic blockers, and neuromuscular blockers			questions and answers
٦	٣	Understanding the properties of adrenergic agonists Direct-acting adrenergic agonists Indirect-acting adrenergic agonists Mixed-acting adrenergic agonists	Adrenergic Agonists	Lectures	daily exams + discussions questions and answers
٧	٣	Understanding alpha-adrenergic receptor blockers Beta-adrenergic receptor blockers Drugs affecting neurotransmitter release	Adrenergic Antagonists	Lectures	daily exams + discussions questions and answers
٨	٣	Understanding the selection of antimicrobial agents Route of administration Determinants of rational dosing Chemotherapeutic spectrum" Antimicrobial drug formulations Drug resistance	Principles of Antimicrobial Therapy	Lectures	daily exams + discussions questions and answers

		Prophylactic use of antibiotics Complications of antibiotic therapy Sites of action of antibiotics			
٩	٣	Understanding penicillins Cephalosporins Other beta-lactam antibiotics Beta-lactamase inhibitors Vancomycin Lipoglycopeptides Daptomycin Fosfomycin Polymyxins	Cell Wall Inhibitors	Lectures	daily exams + discussions questions and answers
١٠	٣	Understanding tetracyclines Glycylcyclines Aminoglycosides Macrolides and ketolides Fidaxomicin Chloramphenicol Clindamycin Quinupristin/Dalfopristin Oxazolidinones	Protein Synthesis Inhibitors	Lectures	daily exams + discussions questions and answers

١١	٣	Understanding folic acid antagonists Sulfonamides, Cotrimoxazole Trimethoprim	Quinolones, Folic Acid Antagonists, and Urinary Tract Antiseptics Fluoroquino	Lectures	daily exams + discussions questions and answers
١٢	٣	Understanding drugs for subcutaneous fungal infections Drugs for superficial (cutaneous) fungal infections	Antimycobacterial Drugs	Lectures	daily exams + discussions questions and answers
١٣	٣	Chemotherapy of amoebiasis Chemotherapy of malaria Chemotherapy of trypanosomiasis Chemotherapy of leishmaniasis Chemotherapy of toxoplasmosis	Antifungal Drugs	Lectures	daily exams + discussions questions and answers
١٤	٣	Chemotherapy of amoebic infections Chemotherapy of malaria Chemotherapy of trypanosomal infections Chemotherapy of leishmaniasis Chemotherapy of toxoplasmosis	Antiprotozoal Drugs	Lectures	daily exams + discussions questions and answers

١٥	٣	Understanding drugs for the treatment of roundworms Drugs for the treatment of hookworms Drugs for the treatment of tapeworms	Anthelmintic Drugs	Lectures	daily exams + discussions questions and answers

Practical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

11. Course Evaluation

20 marks for theory (midterm exam + daily exams) + 20 marks for practical
60 marks for the final exam (theory only)
Total: 100 marks

12. Learning and Teaching Resources

Required textbooks (curricular books any)	Lipincott Pharmacology 3rd Edition, 2006
Main references (sources)	

Recommended books and references (scientific journals, reports...)	

Course Description Form

14. Course Name:
Pathophysiology
15. Course Code:
16. Semester / Year:
First Semester – Third Year – 2025–2026
17. Description Preparation Date:
٢٠٢٥–٢–١
18. Available Attendance Forms: official full attendance
Attendance
19. Number of Credit Hours (Total) / Number of Units (Total)
Total hours: 75 hours Total credits: 4 units
20. Course administrator's name (mention all, if more than one name)

Dr. Mohammed Mohsin Shalal

Mohammed.mohsin@gu.edu.iq

Asst. Lecturer Zainab Khalid

Zainab.k.ali@gu.edu.iq

Asst. Lecturer Noor Ahmed

Noor.a.hammadi@gu.edu.iq

21. Course Objectives

Course Objectives

Describe the basic concepts of pathophysiology at the cellular level related to injury, the self-defense mechanism, mutation, and cellular proliferation. Outline basic pathological factors that influence the disease process.

Describe the impact and abnormal functions upon the organ (s) associated with the disease process of targeted body systems. Describe clinical manifestations associated with the diseased organ(s).

22. Teaching and Learning Strategies

Lectures – Practical – Quizes - Reports

1. Course Structure (theoretical and practical)

theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
١	١	Introducing pathology and its relationship to related sciences such as immunology and histology, along with some commonly used terminology.	Introduction to Pathophysiology	Lectures	Daily quiz and discussion

		In the practical aspect, identifying pathological histological changes caused by cellular necrosis.			
٢	٦	Define key pathological concepts and terminology. Explain the relationship between pathology, immunology, and histology. Identify histopathological changes caused by cellular necrosis.	Cell injury and tissue response; Degeneration; Necrosis; Atrophy; Hypertrophy; Metaplasia and Calcification; Inflammation and Repair.	Lectures	Daily quiz and discussion
٣	٤	Identify disorders of water, electrolyte, and acid–base balance. Differentiate between hypernatremia, hyponatremia, hyperkalemia, and hypokalemia. Understand SIADH and diabetes insipidus. Distinguish between metabolic and respiratory acidosis and alkalosis.	Disorders of electrolytes and water and acid–base balances: Hyper And Hyponatremia ; Hyper and Hypokalemia; Syndrome of inappropriate secretion of ADH; Diabetes insipidus; Metabolic acidosis and alkalosis; Respiratory	Lectures	Daily quiz and discussion

			acidosis and alkalosis.		
٤	٣	Identify major cardiovascular disorders. Differentiate between congestion, edema, thrombosis, embolism, and infarction. Understand shock, heart failure, and coronary heart disease. Distinguish types of hypertension and hypotension. Differentiate between aneurysm and varicose veins.	Disorders of cardiovascular system: Hyperemia; Congestion and edema; Thrombosis; embolism and infarction; Shock; Coronary heart disease and MI; Rheumatic heart disease; Heart failure; Acute pulmonary edema; Essential hypertension; Secondary hypertension; Malignant hypertension; Hypotension; Aneurysm versus varicose veins;	Lectures	Daily quiz and discussion
٥	٣	Identify common respiratory system disorders. Understand the pathophysiology of	Disorders of respiratory system: Pneumonias; Tuberculosis; Respiratory distress	Lectures	Daily quiz and discussion

		pneumonia and tuberculosis. Recognize respiratory distress syndrome and bronchial asthma. Differentiate between emphysema, bronchiectasis, and cystic fibrosis. Understand pulmonary embolism and pulmonary hypertension.	syndrome; Bronchial asthma; Emphysema and bronchiectasis ; Cystic fibrosis; Pulmonary embolism; Pulmonary hypertension.		
٦	٣	Identify common renal system disorders. Understand renal syndromes such as nephrotic syndrome and glomerulonephritis. Recognize kidney diseases associated with diabetes and hypertension. Understand pyelonephritis and drug-induced nephropathies. Differentiate between acute and chronic renal failure.	Disorders of the renal system: Nephrotic syndrome; Glomerulonephritis; Diabetic glomerulosclerosis; Hypertensive glomerular disease; Pyelonephritis ; Drug related nephropathies ; Acute renal failure; Chronic renal failure.	Lectures	Daily quiz and discussion
٧	٤	Identify common gastrointestinal and	Disorders of GI and hepatobiliary	Lectures	Daily quiz and discussion

		hepatobiliary disorders. Understand peptic ulcer and Zollinger–Ellison syndrome. Recognize irritable bowel syndrome, Crohn's disease, and diarrhea. Understand celiac disease, viral hepatitis, and primary biliary cirrhosis. Differentiate between liver failure and cholelithiasis.	systems: Peptic ulcer and Zollinger Ellison syndrome; Irritable bowel syndrome; Crohn's diseaseDiarrhea; Celiac disease; Viral hepatitis; Primary biliary cirrhosis; Liver failure; Cholelithiasis.		
٨	٢	Identify common thyroid function disorders. Understand hypothyroidism and hyperthyroidism. Recognize Graves' disease and thyrotoxicosis.	Disorders of thyroid function: Hypothyroidism. Hyperthyroidism. Graves's disease. Thyrotoxicosis.	Lectures	Daily quiz and discussion
٩	٢	Identify disorders of adrenal gland function. Understand Cushing's syndrome and adrenal cortical insufficiency (primary and secondary).	Disorders of adrenal function: Cushing syndrome. Adrenal cortical Insufficiency	Lectures	Daily quiz and discussion

		Recognize congenital adrenal hyperplasia. Understand pheochromocytoma.	(primary and secondary). Congenital adrenal hyperplasia. Pheochromocytoma.		
١٠	٣	Identify diabetes mellitus and metabolic syndrome. Understand disorders of blood glucose and lipid regulation. Recognize complications associated with diabetes and metabolic syndrome.	Diabetes mellitus and metabolic syndrome;	Lectures	Daily quiz and discussion
١١	٢	Identify dyslipoproteinemia. Understand the impact of lipoprotein disorders on cardiovascular health. Recognize the types and complications associated with these disorders.	Dyslipoproteinemia.	Lectures	Daily quiz and discussion
١٢	٤	Identify the concept of neoplasia. Understand benign and malignant tumors.	Neoplasia	Lectures	Daily quiz and discussion

		Recognize factors causing abnormal cell growth. Understand the impact of tumors on organs and body functions.			
١٣	٢	Identify metabolic and rheumatic disorders of the skeletal system. Understand osteoporosis, osteomalacia, rickets, rheumatoid arthritis, systemic lupus erythematosus, ankylosing spondylitis, gout, and osteoarthritis syndrome. Recognize alterations in immune response and the pathophysiology of immunopathology.	Metabolic &rheumatic disorders of skeletal system: -Osteoporosis, osteomalacia & rickets, rheumatoidarthritis, systemic lupus erythromatosus, ankylosing spondylitis, gout, osteoarthritis syndrome. Alterations in the immune response (pathophysiology of immunopathology):	Lectures	Daily quiz and discussion
١٤	٣	Identify hypersensitivity disorders.	Hypersensitivity disorders. Transpalantation immunopathology. -	Lectures	Daily quiz and discussion

		Understand transplantation immunopathology. Recognize immunodeficiency disorders	Immunodeficiency disorders		
١٥	٣				
Practical					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
١	٢	Introducing the student to cell death and its types	Cell injury	**PowerPoint experiment**	Various tests
٢	٢	Understand the mechanisms of inflammation in tissues. Recognize histological features of acute and chronic inflammation. Practice laboratory techniques for examining inflammatory changes in samples.	Inflammation	**PowerPoint experiment**	
٣	٢	Understand the concept of homeostasis and its maintenance. Understand the process of thrombosis	Homeostasis and thrombosis	**PowerPoint experiment**	Various tests

		and its causative factors. Practice laboratory techniques for assessing coagulation and platelet function.			
٤	٢	Identify growth disturbances at the cellular and tissue levels. Understand the causes and effects of growth alterations on tissues and organs. Practice laboratory techniques to study and diagnose growth disturbances in samples.	Growth disturbance	**PowerPoint experiment**	Various tests
٥	٢	Identify histological changes in liver diseases. Understand the pathological effects on liver tissues. Practice laboratory techniques to examine and diagnose liver diseases in samples.	Liver diseases	**PowerPoint experiment**	Various tests
٦	٢	Identify histological changes associated with neoplasia. Differentiate between benign and malignant	Neoplasia	**PowerPoint experiment**	Various tests

		tumors at the tissue level. Practice laboratory techniques to study and diagnose tumors in samples.			
٧	٢	Identify histological changes in renal system disorders. Understand the effects of various diseases on kidney function and related tissues. Practice laboratory techniques to examine and diagnose kidney diseases in samples.	Renal system	**PowerPoint experiment**	Various tests
٨	٢	Identify histological changes associated with respiratory diseases. Understand the effects of respiratory disorders on lung and airway tissues. Practice laboratory techniques to examine and diagnose respiratory diseases in samples.	Respiratory diseases	**PowerPoint experiment**	Various tests
٩	٢	Identify histological changes in cardiovascular system diseases.	Cardiovascular system	**PowerPoint experiment**	Various tests

		Understand the effects of cardiovascular disorders on heart muscle and blood vessels. Practice laboratory techniques to examine and diagnose cardiovascular diseases in samples.			
١٠	٢	Identify histological changes in gastrointestinal system diseases. Understand the effects of gastrointestinal disorders on related organs and tissues. Practice laboratory techniques to examine and diagnose gastrointestinal diseases in samples.	Gastrointestinal system	**PowerPoint experiment**	Various tests

2. Course Evaluation

20 marks for theory (midterm exam + daily exams) + 20 marks for practical
60 marks for the final exam (theory only)
Total: 100 marks

3. Learning and Teaching Resources

Required textbooks (curricu books, if any)	**Essentials in Pathophysiology by: Carol Mattson Porth 2nd Ed.and pathophysiologly of disease : an introduction to clinical medicine 7ed.Cary D. Hammer, editor**
Main references (sources)	

Recommended books and references (scientific journals, reports...)	

Course Description Form

23. Course Name:
Pharmaceutical Technology I
24. Course Code:
25. Semester / Year:
Furst Semester – Third Stage– 2025-2026
26. Description Preparation Date:
1-2-2026
27. Available Attendance Forms: official
Attendance
28. Number of Credit Hours (Total) / Number of Units (Total)
Total hours: 75 hours Total credits: 4 units
29. Course administrator's name (mention all, if more than one name)
Dr. Ahmed Yaseen alsharea Ahmed.yaseen.alsharea@gau.edu.iq Asst. Lecturer Ahmed Sabah ahmed.s.moneef@gu.edu.iq Pharmacist Hussein Abdul Kareem hussaunabdalkareem1995@gmail.com

30. Course Objectives

Course Objectives

1- Understand the fundamentals of pharmaceutical preparation, including solubility, distribution, powder properties, and compounding/pressing techniques.

2- Learn how to formulate, prepare, and administer various liquid dosage forms, both oral and topical.

3- Explore the principles and techniques used in developing suspensions, including stability, rheology, and formulation methods.

4- Study the formulation and delivery mechanisms of sprays and foams, with a focus on metered-dose inhalers and topical/vaginal applications.

5- Acquire knowledge of parenteral dosage forms, including types of injections, sterilization methods, and production standards.

6- Develop an understanding of storage, packaging, labeling, and handling practices for all the mentioned dosage forms to ensure quality and patient safety.

31. Teaching and Learning Strategies

Use the smart board.

Use presentation slides.

Require periodic reports.

32. Course Structure

No.	Lesson Subject	Hours
1-3	**Pharmaceutical preformulation (Chapter 23)** ***(Aulton's Pharmaceutics; The Design and Manufacture of Medicines; 6th edition, 2022)*** • **The concept of preformulation**	9

	• **Solubility** • **Molecular dissociation** • **Partitioning** • **Dissolution rate** • **Hygroscopicity** • **Physical form** • **Powder properties** **Compaction properties**		
4-9	Solutions (Chapter 13) *(Pharmaceutical Dosage Forms and Drug Delivery Systems by Howard A. Ansel; 11th edition, 2017)* • 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 preparing solutions	9	
7-9	Suspensions	9	

	(*Chapter 14: Pharmaceutical Dosage Forms and Drug Delivery Systems by Howard A. Ansel; 11th edition, 2017)* (*Chapter 26: Aulton's Pharmaceutics; The Design and Manufacture of Medicines; 6th edition, 2022)* • 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		
10-11	Aerosols and foams (Chapter 14) *(Pharmaceutical Dosage Forms and Drug Delivery Systems by Howard A. Ansel; 11th edition, 2017)* • Types of aerosols • Advantages of the aerosol dosage form • The aerosol principle • Aerosol systems • Aerosol container and valve assembly • Metered-dose inhalers • Filling operations • Packaging, labeling, and storage	6	

	• Proper Administration and Use of • Proper administration and use of pharmaceutical aerosols • Examples of aerosols • Topical aerosols • Vaginal and rectal aerosols Foams: Their types and preparation		
12-15	Parenterals *(Chapter 15: Pharmaceutical Dosage Forms and Drug Delivery Systems by Howard A. Ansel; 11th edition, 2017)* *(Chapter 38: Aulton's Pharmaceutics; The Design and Manufacture of Medicines; 6th edition, 2022)* • 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 solutions	16	
	Total Hours	45	

Practical					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
١	٢	Learning laboratory safety rules and good laboratory practices to ensure worker protection, prevent accidents, and maintain the quality and integrity of laboratory results	Introduction: Laboratory Safety and Good Laboratory Practice (GLP)	Using the smart board, conducting experiments, and solving mathematical problems	Discussions and evaluation of practical results
٣–٢	٤	Accurately determining the drug concentration and measuring its maximum solubility using spectroscopic (UV) or high-performance liquid chromatography (HPLC) techniques to ensure the quality and efficacy of pharmaceutical preparations	Calibration curve and saturated solubility determination (UV and HPLC)	Using the smart board, conducting experiments, and solving mathematical problems	Discussions and evaluation of practical results
٤	٢	Understanding the methods of preparing oral solutions and evaluating their quality to ensure correct dosing, good solubility, stability, and ease of use by the patient	Oral solutions: preparation methods and quality evaluation	Using the smart board, conducting experiments, and solving mathematical problems	Discussions and evaluation of practical results
٦–٥	٤	Identifying the components of syrups, methods of preparation, and	Syrups: materials, preparation methods and	Using the smart board, conducting experiments,	Discussions and evaluation of practical results

		evaluating their quality to ensure acceptable taste, accurate dosing, stability, and ease of use for children and adults	quality evaluation	and solving mathematical problems	
٨–٧	٤	Understanding the components of elixirs, their preparation methods, and evaluating their quality to ensure drug solubility, accurate dosing, acceptable taste, and stability of alcoholic-sugar solutions	Elixirs: materials, preparation methods and quality evaluation	Using the smart board, conducting experiments, and solving mathematical problems	Discussions and evaluation of practical results
٩	٢	Understanding the components of tinctures, their preparation methods, and evaluating their quality to ensure drug efficacy, stability, and accurate dosing of concentrated alcoholic solutions	Tinctures: materials, preparation methods and quality evaluation	Using the smart board, conducting experiments, and solving mathematical problems	Discussions and evaluation of practical results
١٠	٢	Understanding the components of aromatic waters, their preparation methods, and evaluating their quality to ensure acceptable taste and aroma, stability, and drug efficacy of aromatic solutions	**Aromatic waters: materials, preparation methods and quality evaluation**	Using the smart board, conducting experiments, and solving mathematical problems	Discussions and evaluation of practical results

١١–١٢–١٣	٦	Understanding the components and suspension of poorly soluble drugs, their preparation methods, and evaluating their quality to ensure particle stability, accurate dosing, ease of use, and drug efficacy	Suspensions: materials, preparation methods and quality evaluation	Using the smart board, conducting experiments, and solving mathematical problems	Discussions and evaluation of practical results
١٤–١٥	٤	Ensuring that injectable preparations meet quality standards in terms of sterility, accurate dosing, stability, absence of contaminants, and patient safety before use	Quality evaluation of parenteral preparations	Using the smart board, conducting experiments, and solving mathematical problems	Discussions and evaluation of practical results

15. Course Evaluation	
20 marks for theory (midterm exam + daily quizzes) + 20 marks for practical 60 marks for the final exam (theory only) Total: 100 marks	
16. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1) Aulton's Pharmaceutics; The Design and Manufacture of Medicines; 6th edition, 2022. 2) Pharmaceutical Dosage Forms and Drug Delivery Systems by Howard A. Ansel; 11th edition, 2017.
Main references (sources)	
Recommended books and references (scientific journals, reports...)	

Course Description Form

33. Course Name:
Pharmaceutical and Cosmetic Preparations
34. Course Code:
35. Semester / Year:
Second Semester – Third Stage– 2025-2026
36. Description Preparation Date:
1-2-2026
37. Available Attendance Forms: official
Attendance
38. Number of Credit Hours (Total) / Number of Units (Total)
Total hours: 75 hours Total credits: 4 units
39. Course administrator's name (mention all, if more than one name)
Dr. Ahmed Yaseen Ahmed.yaseen.alsharea@gau.edu.iq Asst. Lecturer Ahmed Sabah ahmed.s.moneef@gu.edu.iq Pharmacist Hussein Abdul Kareem hussaunabdalkareem1995@gmail.com
40. Course Objectives
Course Objectives 1. Understand the principles of preparation and stability of pharmaceutical emulsions, including surface-active systems and microemulsions. 2. Study the formulation, preparation, and use of semi-solid dosage forms, such as ointments, creams, gels, and topical preparations.

3. Explore the design and applications of suppositories, vaginal suppositories, and medicated sticks, including manufacturing and quality control.
4. Learn the physical, chemical, and therapeutic considerations for selecting appropriate bases and packaging for topical and rectal formulations.
5. Study formulation strategies and clinical uses of cosmetic preparations, including sunscreens, exfoliants, and anti-aging products.
6. Apply formulation knowledge to ensure the safety, efficacy, and patient acceptability of pharmaceutical and cosmetic products.

41. Teaching and Learning Strategies

- Theoretical lectures.
- Practical experiments.
- Scientific reports.
- Laboratory research training.
- Visiting tours in medical factory.

42. Course Structure

No.	Lesson Subject	Hours
1-3	Emulsions (Chapter 14) *(Pharmaceutical Dosage Forms and Drug Delivery Systems by Howard A. Ansel; 11th edition, 2017)* • Purpose of emulsion and emulsification • Theories of emulsification • Gibbs free energy in an emulsion • Preparation of emulsions	9

	• 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		
4-6	Ointments, creams and gels (Chapter 10) *(Pharmaceutical Dosage Forms and Drug Delivery Systems by Howard A. Ansel; 11th edition, 2017)* • 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 dosage forms	9	
7-9	Suppositories, inserts and sticks (Chapter 12) *(Pharmaceutical Dosage Forms and Drug Delivery Systems by Howard A. Ansel; 11th edition, 2017)*	9	

	• 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		
10	Pharmaceutical Incompatibilities (chapter 21) *(Pharmaceutical Dosage Forms and Drug Delivery Systems by Howard A. Ansel; 11th edition, 2017)* Physical incompatibilities, chemical incompatibilities, correction of incompatibilities	2	
10-15	Cosmetic Formulations *(Cosmetic Formulation of Skin Care Products; by Zoe Diana Draelos and Lauren A. Thaman; Taylor and Francis Group; 2006)* • Introduction • Cosmetic formulation of skin care products (Chapter 1) • Toners and astringents (Chapter 5) • Antiperspirants (Chapter 8) • Sunscreens (Chapter 9)	16	

	• Anti-aging skin care formulations (Chapter 11) • Topical exfoliation—clinical effects and formulating considerations (Chapter 15) Herbs in cosmeceuticals (Chapter 19)	
	Total Hours	45

Practical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
١–٢	٤	Identifying the components of emulsions (oil phase, aqueous phase, emulsifying agents) Explaining the basic methods of emulsion preparation Evaluating emulsion quality in terms of stability and physical properties	Emulsions: materials, preparation methods and quality evaluation	Using the smart board and conducting experiments	Discussions and evaluation of practical results
٣–٤	٤	Identifying the components of ointments and types of bases used Explaining the methods of ointment preparation Evaluating ointment quality in terms of homogeneity, stability, and spreadability	Ointments: materials, preparation methods and quality evaluation	Using the smart board and conducting experiments	Discussions and evaluation of practical results
٥	٢	Identifying the components of	Ophthalmic ointments:	Using the smart board	Discussions and

		ophthalmic ointments and requirements for suitable bases Explaining the preparation method of sterile ophthalmic ointments Evaluating quality in terms of sterility, homogeneity, and particle smoothness	materials, preparation methods and quality evaluation	and conducting experiments	evaluation of practical results
٦	٢	Identifying the components of creams and their types (O/W, W/O) Explaining the methods of cream preparation Evaluating cream quality in terms of homogeneity, stability, and spreadability	Creams: materials, preparation methods and quality evaluation	Using the smart board and conducting experiments	Discussions and evaluation of practical results
٧	٢	Identifying the components of gels and types of gelling agents Explaining the methods of gel preparation Evaluating gel quality in terms of viscosity,	Gels: materials, preparation methods and quality evaluation	Using the smart board and conducting experiments	Discussions and evaluation of practical results

		homogeneity, and stability			
٩–٨	٤	Identifying the components of suppositories and types of bases used Explaining the methods of suppository preparation Evaluating quality in terms of weight, melting/dissolution, and homogeneity	Suppositories: materials, preparation methods and quality evaluation	Using the smart board and conducting experiments	Discussions and evaluation of practical results
١١–١٠	٤	Identifying the components of hair care products Explaining the methods of hair product preparation Evaluating quality in terms of stability, appearance, and functional performance	**Hair care formulations: materials, preparation methods and quality evaluation**	Using the smart board and conducting experiments	Discussions and evaluation of practical results
١٣–١٢	٤	Identifying the components of skincare products Explaining the methods of skincare product preparation	Skin care formulations: materials, preparation methods and quality evaluation	Using the smart board and conducting experiments	Discussions and evaluation of practical results

		Evaluating quality in terms of stability, safety, and efficacy			
١٥–١٤	٤	Distinguishing types of drug incompatibility (physical and chemical) Detecting incompatibility using observation and appropriate tests Evaluating the impact of incompatibility on the stability and efficacy of the formulation	Detection and characterization of pharmaceutical incompatibilities (chemical and physical incompatibilities)	Using the smart board and conducting experiments	Discussions and evaluation of practical results

17. Course Evaluation
20 marks for theory (midterm exam + daily quizzes) + 20 marks for practical 60 marks for the final exam (theory only) Total: 100 marks

18. Learning and Teaching Resources	
Required textbooks (curricular book any)	1) Pharmaceutical Dosage Forms and Drug Delivery Systems by Howard A. Ansel; 11th edition, 2017. 2) Cosmetic Formulation of Skin Care Products; by Zoe Diana Draelos and Lauren A. Thaman; Taylor and Francis Group; 2006(النظري) (العملي) 1) Handbook of Extemporaneous Preparation by Mark Jackson and Andrew Lowey; 1st edition; 2010. 2) British Pharmacopeia (BP); 2025 edition. 3) United States Pharmacopeia- National Formulary (USP-NF); 2025 edition. 4) FDA Cosmetic Regulations

Main references (sources)	
Recommended books and references (scientific journals, reports...)	

Course Description Form

43. Course Name:
Pharmacology II
44. Course Code:
45. Semester / Year:
First Semester – Fourth Stage – 2025-2026
46. Description Preparation Date:

٢٠٢٦-٢-١

47. Available Attendance Forms: official

Attendance

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

Total hours: 75 hours

Total credits: 4 units

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

Assistant Lecturer Zainab Khalid Ali

Email: Zainab.k.ali@gu.edu.iq

50. Course Objectives

Course Objectives

Understand the mechanism of action of drugs affecting vital systems (nervous, cardiovascular, respiratory, gastrointestinal

Know the therapeutic uses of each drug class

Determine appropriate dosages and routes of administration

Recognize side effects and drug interactions

Ensure the safe and rational use of medications

51. Teaching and Learning Strategies

Using the smart board , Using presentation slides. Requiring periodic reports

52. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	3	Education about CNSpharmacology+CNS stimulants	Introduction to CNS pharmacology+CNS stimulants	Power point presentation	Witten and oral examination
2	3	Education about Anxiolytic and Hypnotic drugs.	Anxiolytic and Hypnotic drugs.	Power point presentation	Witten and oral examination
3	3	Education about General and Local Anesthetics	General and Local Anesthetics.	Power point presentation	Witten and oral examination
4	3	Education about Antidepressant drugs	Antidepressant drugs	Power point presentation	Witten and oral examination
5	3	Education about Antipsychotic (neuroleptic) drugs	Antipsychotic (neuroleptic) drugs	Power point presentation	Witten and oral examination
6	3	Education about Opioid analgesics and antagonists.	Opioid analgesics and antagonists.	Power point presentation	Witten and oral examination

7	3	Education about Treatment of neurodegenerative diseases.	Treatment of neurodegenerative diseases.	Power point presentation	Witten and oral examination
8	3	Education about Antiepileptic Drugs.	Antiepileptic Drugs.	Power point presentation	Witten and oral examination
10	3	Education about Diuretics+The treatment of heart failure	Diuretics+The treatment of heart failure	Power point presentation	Witten and oral examination
11	3	Education about Antiarrhythmic drugs+Antianginal Drugs	Antiarrhythmic drugs+Antianginal Drugs	Power point presentation	Witten and oral examination
12	3	Education about Antihypertensive drugs	Antihypertensive drugs	Power point presentation	Witten and oral examination
13	3	Education about Drugs affecting the blood.+Antihyperlipidemic drugs	Drugs affecting the blood.+Antihyperlipidemic drugs	Power point presentation	Witten and oral

					examination
14	3	Education about Gastrointestinal and antiemetic drugs.	Gastrointestinal and antiemetic drugs.	Power point presentation	Witten and oral examination
15	3	Education about Drugs acting on the respiratory system	Drugs acting on the respiratory system	Power point presentation	Witten and oral examination

Course description (practical)

weeks	Laboratory sessions & *Clinical requirements*	hours
١	Rout of drag administration effect of drugs on IOP rabbits	2
٢	. Onset and Duration of Drugs.	2
3	Absorption and excretion of drugs	2
4	effects of Parasympathomimetic on Gland excretion	2
5	drugs and human eye	2
6	effect of drugs on IOP rabbits	2
7	Evaluation of NSAIDS	
8	evaluation of antiparkinsonian drug	2
		2
10	effect of anticonvulsant drugs	2
11	effects of drugs and their antagonists on isolated rats ileum	2
12	effects of drugs and their antagonists on isolated n ileum	2

3. Course evaluation
   20 marks for theory (midterm exam + daily quizzes) + 20 marks for practical
   60 marks for the final exam (theory only)
   Total: 100 marks

4. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Pharmacology; Lippincott Latest edition
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

53. Course Name:
Organic Pharm.Chemistry II
54. Course Code:
55. Semester / Year:

First Semester – Fourth Stage – 2025-2026

56. Description Preparation Date:

٢٠٢٦-٢-١

57. Available Attendance Forms: official

Attendance

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

Total hours: 75 hours

Total credits: 4 units

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

Assistant Lecturer Hamza Fadhil Hamza

Email: Hamza.fadhil@gu.edu.iq

Assistant Lecturer Hadeel Hussein

Email: Hadeel.h.hamza@gu.edu.iq

60. Course Objectives

Course Objectives

This course provides an in-depth study of pharmaceutical chemistry and the pharmacological properties of the major drug classes targeting the body's key physiological systems.

The curriculum focuses on the relationship between chemical structure and biological activity (SAR), the mechanism of action of drugs on specific receptors, and the therapeutic applications of these pharmacological agents in the treatment of various diseases.

61. Teaching and Learning Strategies

Lectures , Conducting practical experiments, Reading textbooks, Engaging in scientific discussions

62. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introduction about the Cholinergic agents ,cholinergic receptors and their subtype	Cholinergic agents ,cholinergic receptors and their subtype	Lecture	Quiz
1-3	5	Understanding the chemistry of Cholinergic agonists, stereochemistry and SAR, Products, cholinesterase inhibitors	Cholinergic agonists; stereochemistry and SAR; products; cholinesterase inhibitors	Lecture	Quiz
3-4	5	Study the chemistry of Cholinergic blocking agents	Cholinergic blocking agents	Lecture	Quiz
5-7	9	Understanding the chemistry of adrenergic receptor; drugs affecting adrenergic neurotransmission; sympathomimetic agents, adrenergic receptor antagonists	Adrenergic agents	Lecture	Quiz
8-9	5	Understanding the chemistry of CNS depressant	CNS depressant	Lecture	Quiz

9-10	2	Understanding the chemistry of CNS stimulants	CNS stimulants	Lecture	Quiz
10-11	5	Understanding the chemistry of drugs affecting the Renin Angiotensin pathway and calcium blockers, vasodilators.	Drugs affecting cardiovascular system	Lecture	Quiz
12-14	7	Understanding the chemistry of Histamine and antihistaminic agents	Histamine and antihistaminic agents	Lecture	Quiz
14-15	5	Understanding the chemistry of NSAIDs	NSAIDs	Lecture	Quiz

Practical					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
١	٢	Understanding the methods of preparing salicylic acid Identifying the fundamental chemical reaction involved Applying separation and purification techniques Evaluating the purity of the final product	Preparation of salicylic acid	Delivering lectures and conducting experiments	Daily exams and oral questions

٢	٢	Understanding the principle of recrystallization of salicylic acid Applying methods for purification of crystals Evaluating the purity of the final product Relating the technique to the quality of pharmaceutical preparation	Re-crystallization of salicylic acid	Delivering lectures and conducting experiments	Daily exams and oral questions
٣	٢	Understanding the steps of aspirin preparation Identifying the fundamental chemical reaction (acetylation of salicylic acid) Applying purification and separation techniques Evaluating the purity and quality of the final product	Synthesis of aspirin.	Delivering lectures and conducting experiments	Daily exams and oral questions
٤	٢	Understanding the principle of aspirin recrystallization Applying methods for crystal purification	Re-crystallization of aspirin.	Delivering lectures and conducting experiments	Daily exams and oral questions

		Evaluating the purity and quality of the final product			
٥	٢	Measuring the aspirin content in a known sample Applying appropriate analytical methods Evaluating the accuracy and reliability of the results Relating the results to the quality and effectiveness of the drug	Assay of aspirin (known sample)	Delivering lectures and conducting experiments	Daily exams and oral questions
٦	٢	Determining the aspirin content in an unknown sample Applying appropriate analytical methods Evaluating the accuracy and reliability of the results Relating the results to the quality and effectiveness of the drug	Assay of aspirin (unknown sample)	Delivering lectures and conducting experiments	Daily exams and oral questions
٧	٢	Understanding the nitration reaction of benzene Identifying the materials and basic preparation steps	**Preparation of nitrobenzene.**	Delivering lectures and conducting experiments	Daily exams and oral questions

		Applying laboratory safety procedures Evaluating the purity of the final product			
٨	٢	Understanding the principle of aniline preparation Identifying the fundamental chemical transformation involved Adhering to laboratory safety procedures Evaluating the purity of the final product	Preparation of aniline.	Delivering lectures and conducting experiments	Daily exams and oral questions
٩	٢	Understanding the acetylation reaction of aniline Identifying the basic preparation steps Applying laboratory safety procedures Evaluating the purity of the final product	Preparation of acetanilide	Delivering lectures and conducting experiments	Daily exams and oral questions
١٠	٢	Understanding the principle of acetanilide recrystallization Applying methods for crystal purification	Re-crystallization of acetanilide.	Delivering lectures and conducting experiments	Daily exams and oral questions

		Evaluating the purity and quality of the final product			
١١	٢	Understanding the chlorosulfonation reaction of acetanilide Identifying the basic preparation steps Applying laboratory safety procedures Evaluating the purity of the final product	Chlorosulfonation of acetanilide	Delivering lectures and conducting experiments	Daily exams and oral questions
١٢	٢	Understanding the amination reaction of the chlorosulfonylbenzene derivative Identifying the basic preparation steps Applying laboratory safety procedures Evaluating the purity and quality of the final product	Amination of p-chlorobenzene sulfonyl chloride	Delivering lectures and conducting experiments	Daily exams and oral questions
١٣	٢	Understanding the hydrolysis reaction of the chlorosulfonylbenzene derivative	Hydrolysis of p-chlorobenzene sulfonyl chloride to sulfanilamide	Delivering lectures and conducting experiments	Daily exams and oral questions

		Converting the compound to sulfanilamide Applying laboratory safety procedures Evaluating the purity and quality of the final product			
١٤	٢	Understanding the preparation reaction of paracetamol from para-hydroxyacetanilide Identifying the basic preparation steps Applying laboratory safety procedures Evaluating the purity and quality of the final product	Synthesis of paracetamol.	Delivering lectures and conducting experiments	Daily exams and oral questions

1. Course Evaluation	
20 marks for theory (midterm exam + daily quizzes) + 20 marks for practical 60 marks for the final exam (theory only) Total: 100 marks	
2. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1) Foye's Principles of Medicinal Chemistry Roche PhD (Author), S. William PhD Zito 7 th Edition PhD by Victoria PhD F. , College of Pharmacy, Houston Uni, Texas, USA. 2) Wilson and Gisvolds textbook of organic medicinal and pharmaceutical chemistry, John M. B.; John H.B. (twelfth edition). 3) An Introduction to Medicinal Chemistry 7th Edition by Graham L. Patrick, University of the West of Scotland, UK
Main references (sources)	

Recommended books and references (scientific journals, reports...)	Internet sources including official sites, research papers, academic foundations, and others.

Course Description Form

63. Course Name:
Clinical Pharmacy I
64. Course Code:
65. Semester / Year:
First Semester – Fourth Stage – 2025-2026
66. Description Preparation Date:
٢٠٢٦-٢-١
67. Available Attendance Forms: official
Attendance
68. Number of Credit Hours (Total) / Number of Units (Total)
Total number of hours: 60 hours Total number of units: 3 units
69. Course administrator's name (mention all, if more than one name)
Dr. Atheer Khudair Hamad atheerspace@gmail.com

Dr.Noor Ahmed Hammadi

Noor.a.hammadi@gu.edu.iq

70. Course Objectives

Course Objectives

Presentation of disease definitions, epidemiology, etiology, and treatment methods

Over-the-counter (OTC) treatments available for each condition

Cases requiring specialist referral and treatment options for each case study

71. Teaching and Learning Strategies

Using the smart board

Using presentation slides

Requiring periodic reports

72. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	To Understand	Introduction to Community Pharmacy Practice & Clinical Reasoning	Lectures Discussion sessions	Witten and oral examination
2	2	To Understand	Respiratory System: Cough, Common Cold, Sore Throat, Allergic rhinitis	Lectures Discussion sessions	Witten and oral examination

3	2	To understand	Eye and Ear Conditions	Lectures Discussion sessions	Witten and oral examination
4	2	To understand	Central Nervous System: Headache, Insomnia, & Motion Sickness.	Lectures Discussion sessions	Witten and oral examination
5	2	To understand	Oral Health: Mouth Ulcers (Aphthous, Herpes Simplex, Candidiasis), Gingivitis, Toothache	Lectures Discussion sessions	Witten and oral examination
6	2	To understand	Women's Health & Gynaecology: Premenstrual Syndrome, Dysmenorrhoea, Thrush, Cystitis and Urinary Tract Infections, Emergency Contraception.	Lectures Discussion sessions	Witten and oral examination
7	2	To understand	Gastroenterology I - Dyspepsia, Constipation, Diarrhoea	Lectures Discussion sessions	Witten and oral examination
8	2	To understand	Gastroenterology II - Irritable Bowel	Lectures	Witten and

			Syndrome, Haemorrhoids	Discussion sessions	oral examination
9	2	To understand	Dermatology I Dandruff, Seborrhoeic Dermatitis	Lectures Discussion sessions	Witten and oral examination
10	2	To understand	Dermatology II - Fungal, Hair Loss, Warts, Scabies, Acne, Cold Sores	Lectures Discussion sessions	Witten and oral examination
11	2	To understand	Dermatology III - Dermatitis, Sun Exposure, cosmetic preparations	Lectures Discussion sessions	Witten and oral examination
12	2	To understand	Musculoskeletal :Conditions Back Pain, Neck Pain, Shoulder Pain, Knee Pain, Sprains and Strains.	Lectures Discussion sessions	Witten and oral examination
13	2	To understand	Paediatrics: Infantile colic, Teething, Nappy rash, Head lice, Threadworm, Oral thrush	Lectures Discussion sessions	Witten and oral examination

14	2	To understand	General Health: Nosebleeds, Weight Loss.	Lectures Discussion sessions	Witten and oral examination
15	2	To understand	Nicotine replacement therapy	Lectures Discussion sessions	Witten and oral examination

Course description (practical)		
weeks	Laboratory sessions & *Clinical requirements*	hours
١	Communication with patients.	2
٢	Respiratory system in practice (part I): Cough.	2
3	Respiratory system in practice (part II): Common cold. 2	2
4	G.I.T system in practice (part I): Constipation.	2
5	G.I.T system in practice (part II): Diarrhea and IBS.	2
6	GIT system in practice (part III): GERD& indigestion.	2
7	Skin conditions in practice (part I): Hair loss; cold sore and athlete's foot.	2
8	Skin conditions in practice (part II): Dandruff, Eczema and mouth ulcer.	2
9	Skin conditions in practice (part III): warts and scabies.	2
10	Pediatrics in practice: Oral thrush; colic; pinworm and napkin rash.	2
11	Minor eye disorders in practice.	2
١٢	CNS system: Insomnia, motion sickness, obesity and nicotine replacement therapy (NRT).	٢
١٣	Drug Information sources for pharmacist.	٢
١٤	An update in reclassification of OTC drugs.	٢

١٥	Collective practice.	٢

5. Course evaluation 20 marks for theory (midterm exam + quizzes) + 20 marks for practical 60 marks for the final exam (theory only) Total: 100 marks	
6. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	**1)** Community Pharmacy Symptoms, Diagnosis and Treatment. Sixth Edition. Paul Rutter. Last edition. **2)** Symptoms in the Pharmacy: A Guide to the Management of Common Illnesses and Disease Prevention. TENTH EDITIO Alison Blenkinsopp. 2025.
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

73. Course Name:
Biopharmaceutics
74. Course Code:
75. Semester / Year:

First Semester – Fourth Stage – 2025-2026

76. Description Preparation Date:

٢٠٢٦-٢-١

77. Available Attendance Forms: official

Attendance

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

Total number of hours: 60 hours

Total number of units: 3 units

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

Dr.Ahmed Yaseen Alsharea

Email: Ahmed.yaseen.alsharea@gau.edu.iq

Assistant Lecturer Qasim Khalid

Email: Qasim.khalid@gau.edu.iq

80. Course Objectives

Course Objectives

Introduction to biopharmaceutics through an introduction to the field and a study of the biopharmaceutical aspects of products

This includes drug absorption, absorption mechanisms, and physical and chemical factors. The course also covers solubility rates and types of pharmaceutical formulations. This study investigated open-system, single-compartment, and multi-compartment models, pharmacokinetics of drug absorption, bioavailability and bioequivalence, drug clearance from biological systems, hepatic drug elimination, protein binding, intravenous administration, multiple dosing regimens, pharmacokinetics, and dose adjustment in renal disease.

81. Teaching and Learning Strategies

Brainstorming

Practical field training strategy

Using the smart screen

Using presentation software

Using illustrative videos

82. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Biopharmaceutical concept	Introduction to Biopharmaceutics	Lectures	Witten and oral examination
2	2	Pharmacokinetics	Biopharmaceutical aspects of products: Drug absorption	Lectures	Witten and oral examination
3	2	Pharmacokinetics	Pharmacokinetics: Mechanisms of Absorption. Chemical and Physical Factors	Lectures	Witten and oral examination
4	2	Dissolution rate of the drug and type of dosage forms	Drug solubility rate and pharmaceutical form type; absorption mechanisms; factors = =	Lectures	Witten and oral examination
5	2	Get acquainted with an open model	One compartment open model	Lectures	Witten and oral

		with one compartment	from the biological systems		examination
6	2	Knowledge of multi-section models	Multicompartment models	Lectures	Witten and oral examination
7	2	Pharmacokinetics of drug absorption	Pharmacokinetics of drug absorption	Lectures	Witten and oral examination
8	2	Knowledge of bioavailability and bioequivalence	Bioavailability and bioequivalence	Lectures	Witten and oral examination
9	2	Methods for the human body to get rid of the drug	Clearance of drugs	Lectures	Witten and oral examination
10	2	Knowing the role of the liver in drug metabolism	Hepatic elimination of drugs	Lectures	Witten and oral examination
11	2	Know how drugs	Protein binding of	Lectures	Witten and

		are transported by body proteins	drugs		oral examination
12	2	Intravenous administration of drugs (intravenous infusion)	Intravenous administration of drugs (intravenous infusion)	Lectures	Witten and oral examination
13	2	Understanding Dose Intervals for a Single Drug and Multiple Dose Regimes	Multiple Dosing Systems	Lectures	Witten and oral examination
14	2	Drug dispersibility	Non-linear pharmacokinetics	Lectures	Witten and oral examination
15	2	How to calculate drug doses for kidney patients. The mechanism for adjusting drug doses in kidney patients.	The mechanism for adjusting drug dosage in kidney patients	Lectures	Witten and oral examination

Practical					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
٢–١	٤	Identifying a clear research problem in pharmaceutics	Research skills in Pharmaceutics (preparing a proposal)	Lectures and conducting an experiment	Daily exams

		Formulating research objectives and questions/hypotheses Conducting a concise and critical literature review Choosing an appropriate methodology and experimental design Determining materials, tools, and variables Observing research ethics Preparing a timeline and accurate scientific references			
٣	٢	Understanding the principles and techniques of HPLC Selecting the appropriate column and mobile phase Setting operational conditions (pH, flow rate, wavelength Optimizing separation, accuracy, and sensitivity Evaluating method validity (Validation)	HPLC method development	Lectures and conducting an experiment	Daily exams

٤	٢	Predicting pharmacokinetic properties from chemical structure Anticipating interactions with P-gp transporter and enzymes Interpreting the absorption and bioavailability of a drug like metformin	Prediction pharmacokinetics software, such as SWISS ADME, predicts the possibility of including the p-gp efflux transporter and enzymes according to the chemical structure, such as Metformin	Lectures and conducting an experiment	
٥	٢	Preparing standard solutions of known concentrations Constructing an absorption versus concentration curve Determining linearity and the regression equation Using the curve to estimate the concentration of nitrofurantoin	Calibration curve of Nitrofurantoin	Lectures and conducting an experiment	Daily exams
٧-٦	٤	Evaluating tablet dissolution in simulated gastric and intestinal media Comparing the rate and extent of drug release	Dissolution of the oral tablet in artificial gastric juice and artificial intestinal juice	Lectures and conducting an experiment	Daily exams

		Predicting the drug's behavior within the gastrointestinal tract			
٨–٩–١٠	٦	Understanding the principle of sequential dissolution (gastric followed by intestinal) Distinguishing between the diffusion method and the disintegration method Evaluating the effect of pH on the dissolution of a poorly soluble weak base Simulating the drug's behavior within the gastrointestinal tract	Transfer method and dumping method (dissolution in two successive media: gastric and intestinal media). Applying low water-soluble weak base	Lectures and conducting an experiment	Daily exams
١١–١٢	٤	Evaluating the effect of antacids on drug dissolution Studying the impact of food type on the dissolution rate Interpreting changes in dissolution due to pH variations and interactions	Evaluation of different types of antacids and types of food on the dissolution of the tablet	Lectures and conducting an experiment	Daily exams
١٣–١٤	٤	Understanding the calculation of the area under the curve (AUC)	Bioavailability-trapezoidal method	Lectures and conducting an experiment	Daily exams

		Applying the trapezoidal method Estimating the drug's bioavailability			
١٥	٢	Understanding the concept of volume of distribution (Vd) Calculating Vd from dose and plasma concentration Interpreting the significance of Vd on drug distribution in the body	Volume of distribution calculation	Lectures and conducting an experiment	Daily exams

1. Course Evaluation

20 marks for theory (midterm exam + daily tests) + 20 marks for practical
60 marks for the final exam (theory only)
Total: 100 marks

2. Learning and Teaching Resources

Required textbooks (curricular book: any)	Shargel L, Yu AB, (Eds.), Applied Biopharmaceutics and Pharmacokinetics; The edition 6, 2012.
Main references (sources)	1-Martin´s physical pharmacy and pharmaceutical sciences, Patrick J Sinko Wolters Kluwer. Lippincott Williams &Wilkins. Philadelphia. 2011 2-Manual for Practical Biopharmaceutics Adopted by the Department
Recommended books and references (scientific journals, reports...)	1- British pharmacopoeia 2- United State Pharmacopoeias 3- European Pharmacopeias
Electronic References, Websites	internet sources including official sites, research papers, academic foundations, and others.

Course Description Form

83. Course Name:
Public Health
84. Course Code:
85. Semester / Year:
First Semester – Fourth Stage – 2025-2026
86. Description Preparation Date:
٢٠٢٦-٢-١
87. Available Attendance Forms: Attendance
88. Number of Credit Hours (Total) / Number of Units (Total)
Total number of hours: 30 hours Total number of units: 2 units
89. Course administrator's name (mention all, if more than one name)
Assistant Professor Dr. Ali Mohammed Ali Hussein Al-Nuaimi Email: Ali.m.alnuaimi@gu.edu.iq Assistant Lecturer Zainab Khalid Ali Email: Zainab.k.ali@gu.edu.iq

90. Course Objectives

Course Objectives

Introducing the student to the concept within the healthcare system, and developing skills in providing pharmaceutical care and managing pharmacy services in a safe and effective manner.

Focusing on promoting the rational use of medicines and adherence to regulations to ensure patient safety.

91. Teaching and Learning Strategies

Using the smart board

Using presentation slides

Requiring periodic reports

92. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	٢	Education about The scope and concerns of public health, health care system in Iraq	Introduction: The scope and concerns of public health, health care system in Iraq	Power point presentation	Witten and oral examination
1	٢	Education of Measuring, Monitoring, and Evaluating the Health of a Population	Measuring, Monitoring, and Evaluating the Health of a Population	Power point presentatio	Witten and oral examination
2	٢	Education of Population screening and public health	Population screening and public health	Power point presentatio	Witten and oral examination

2	٢	Prevention and control of non-communicable diseases	Prevention and control of non-communicable diseases	Power point presentatio	Witten and oral examination
3	٢	Principles of infectious disease control	Principles of infectious disease control	Power point presentatio	Witten and oral examination
3	٢	National immunization plan of Iraq.	National immunization plan of Iraq.	Power point presentatio	Witten and oral examination
4	٢	Communicable diseases	Communicable diseases	Power point presentatio	Witten and oral examination
4	٢	Prevention and control of public health hazards	Prevention and control of public health hazards	Power point presentatio	Witten and oral examination
5	2	Major health problems (Obesity, Physical	Major health problems (Obesity, Physical activity	Power point presentatio	Witten and oral examination

		activity and health, Public	and health, Public		
6	2	Nutritional disorders	Nutritional disorders	Power point presentatio	Witten and oral examination
7	2	Family health	Family health	Power point presentation	Witten and oral examination
8	2	Environmental health	Environmental health	Power point presentation	Witten and oral examination
٩	2	Occupational health	Occupational health	Power point presentation	Witten and oral examination
١٠	2	Knowledge about Travel health	Travel health	Power point presentation	Witten and oral examination
١١	2	Pharmacy Services and Management in Community and Hospital Settings	Pharmacy Services and Management in Community and Hospital Settings	Power point presentation	Witten and oral examination

١٣-١٢	٤	Medication Safety, Regulation, and Rational Use of Medicines	Medication Safety, Regulation, and Rational Use of Medicines	Power point presentation	Witten and oral examination
١٥-١٤	٤	Principles and Concepts of Pharmacy Practice and Pharmaceutical	Principles and Concepts of Pharmacy Practice and Pharmaceutical	Power point presentation	Witten and oral examination

1. Course evaluation weekly examination reports Homeworks	
2. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Textbook Short ,)Eds (,HM Gilles ,AO Lucas Public Health Medicine for the Tropic, (4th Ed),2003 Lecture Notes in pharmacy practice, lilian M - Azzopardi, 2010, pharmaceutical press, london
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

19. Course Name:
Pharmacy Practice
20. Course Code:
21. Semester / Year:
First Semester – Fourth Stage – 2025-2026
22. Description Preparation Date:
1-2-2026
23. Available Attendance Forms:
Attendance
24. Number of Credit Hours (Total) / Number of Units (Total)
Total number of hours: 30 hours Total number of units: 2 units
25. Course administrator's name (mention all, if more than one name)
Dr. Mohammed Mohsin Shlal Mohammed.mohsin@gu.edu.iq
26. Course Objectives
At the end of this course, students are expected to learn: 1) How the health care system in Iraq going on 2) Proper use of antimicrobial 3) Different regions of pharmacy practice
27. Teaching and Learning Strategies
Lectures Reports Discussion dialogues
28. Course Structure (theoretical and practical)

theoretical					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
١	٢	Identifying the components of the healthcare system in Iraq Understanding the role of the Ministry of Health and the public and private sectors Explaining the levels of healthcare (primary, secondary, tertiary) Recognizing the challenges facing the healthcare system and ways to improve it	**Health care system in Iraq**	lectures	Discussion through Q&A and daily exam
٢	٢	Defining drug information services and their importance in healthcare Identifying primary, secondary, and tertiary sources of drug information Distinguishing between reliable and unreliable sources Using drug information sources correctly to support therapeutic decision-making	Drug Information Services and Sources of Information	lectures	Discussion through Q&A and daily exam
٣	٢	Identifying the Beers, STOPP, and START criteria	Potentially Inappropriate	lectures	Discussion through

		Using these criteria to reduce medication errors in the elderly	Medications (Beers/STOPP/START)		Q&A and daily exam
٤	٢	Understanding the principles of biosafety in pharmacy Applying precautionary measures to minimize biological hazards	Biosafety in pharmacy practice	lectures	Discussion through Q&A and daily exam
٥	٢	Understanding the concept of evidence-based medicine Using scientific evidence to make therapeutic decisions	Evidence-based medicine	lectures	Discussion through Q&A and daily exam
٦	٢	Understanding the concept of personalized medicine/pharmacotherapy Explaining the role of genetic factors in selecting appropriate therapy	**Personalized medicines**	lectures	Discussion through Q&A and daily exam
٧	٢	Defining medication adherence and its importance Identifying factors affecting patient adherence to therapy	Medication Adherence	lectures	Discussion through Q&A and daily exam
٨	٢	Defining pharmacovigilance and its importance Recognizing the reporting of adverse drug reactions	Pharmacovigilance	lectures	Discussion through Q&A and daily exam
٩	٢	Defining drug-related problems and medication errors	**Drug Related Problems and Medication Errors**	lectures	Discussion through Q&A

		Identifying their causes and ways to minimize them			and daily exam
١٠	٢	Understanding the concept of rational antibiotic use Reducing microbial resistance and improving treatment outcomes	**Antimicrobial stewardship**	lectures	Discussion through Q&A and daily exam
١١	٢	Understanding the fundamentals and importance of vaccination Knowing the immunization schedule and safe administration methods	**Immunization Practice**	lectures	Discussion through Q&A and daily exam
١٢	٢	Understanding leadership skills in pharmacy Developing the ability to manage teams and make decisions	**Pharmacy leadership**	lectures	Discussion through Q&A and daily exam
١٣	٢	Knowing safe methods for drug disposal Minimizing environmental and health risks	**Drug disposal**	lectures	Discussion through Q&A and daily exam
١٤	٢	Understanding the concept of orphan drugs and off-label use Recognizing the importance of safety and efficacy when using them	**Orphan drugs & off-label use of medications**	lectures	Discussion through Q&A and daily exam

١٥	٢	Understanding the provision of remote pharmacy services Using digital technologies to improve healthcare delivery	**Telepharmacy and digital health**	lectures	Discussion through Q&A and daily exam
Practical					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
29. Course Evaluation					
30 marks for theory (midterm exam + quizzes) 70 marks for the final exam (theory only) Total: 100 marks					
30. Learning and Teaching Resources					
Required textbooks (curricular books any)		1) Joseph T. DiPiro, Gary C. Yee, L. Michael Posey, Stuart T. Haines, Thomas D. Nolin, Vicki Ellingrod. Pharmacotherapy: A Pathophysiologic Approach, eleventh editions. (2020).			

	2) Antimicrobial stewardship programmes in health-care facilities in low- and middle-income countries. A WHO practical toolkit 3) Chisholm-Burns MA, Vaillancourt AM, Shepherd M, Birtcher K. Pharmacy-Management-Leadership-Marketing-and-Finance 4) WHO. Guidelines for safe disposal of unwanted pharmaceuticals in and after emergencies 5) American Geriatrics Society: updated AGS Beers Criteria for Potentially Inappropriate Medication Use in Older Adults. 6) Lilian M Azzopardi. Lecture Notes in Pharmacy Practice. 2010 7) Aparasu RR, Bentley JP. Principles of research design and drug literature evaluation 8) Cipolle RJ, Strand L, Morley P. Pharmaceutical Care Practice: The Patient-Centered Approach to Medication Management 9) Zgarrick DP, Moczygemba LR, Alston GL, Desselle SP. Pharmacy management: essentials for all practice settings. ASHP Guidelines on the Pharmacist's Role in Immunization. 10) Orphan Drugs and Rare Diseases. 2014. David C Pryde; Michael Palmer 11) The Pharmacist in Public Health Education, Applications, and Opportunities. 2010. Hoai-An Truong, James L. Bresette, Jill A. Sellers
Main references (sources)	
Recommended books and references (scientific journals, reports...)	

Course Description Form

93. Course Name:
Pharmacology III
94. Course Code:
95. Semester / Year:
96. Description Preparation Date:
٢٠٢٦-٢-١
97. Available Attendance Forms: official
Attendance
98. Number of Credit Hours (Total) / Number of Units (Total)
Total number of hours: 30 hours Total number of units: 2 units
99. Course administrator's name (mention all, if more than one name)
Assistant Lecturer Zainab Khalid Ali Email: Zainab.k.ali@gu.edu.iq
100. Course Objectives
Course Objectives 1. Studying the pathophysiology of inflammation, identifying appropriate anti-inflammatory drugs, and detailing the medications used to treat inflammation, including important information on biological drugs. 2. Medications used to treat gout. 3. Antidiabetic drugs, including insulin and other medications used to treat diabetes

4. Applying pharmacological concepts related to hypothalamic and pituitary hormones, as well as thyroid hormones, including medications used to treat hypothyroidism and hyperthyroidism.

5. Studying reproductive hormones and their inhibitors, in addition to methods of contraception.

6. Providing important information about medications used to treat obesity, osteoporosis, and erectile dysfunction.

7. Providing pharmacological concepts related to anticancer drugs.

101. Teaching and Learning Strategies

- Interactive lectures and presentations
- Case-based learning
- Guided self-directed learning
- Interactive workshops and seminars

102. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Understanding anterior pituitary hormones Posterior pituitary hormones Thyroid hormones	**Pituitary and Thyroid**	Power point presentation	Witten and oral examination
2	3	Understanding the basics of Thyroid and Antithyroid drugs: Lectures and exams	Thyroid and Antithyroid drugs	Power point presentatio	Witten and oral examination
3	3	Student's ability to identify estrogens Selective estrogen receptor modulators	Estrogens	Power point presentatio	Witten and oral examination

		Progestins, contraceptives, androgens			
4	3	Understanding the basics of specific medications	progestins, and androgens	Power point presentatio	Witten and oral examination
5	3	Understanding the basics of specific medications	Contraceptives	Power point presentation	Witten and oral examinatio
6	3	Understanding the basics of specific medications	The adrenal hormones	Power point presentatio	Witten and oral examination
7	3	Understanding the basics of specific medications	Drugs affecting bone metabolism	Power point presentatio	Witten and oral examination
8	3	Understanding the basics of specific medications	Drugs for diabetes (insulin)	Power point presentatio	Witten and oral examination
9	3	Understanding the basics of specific medications	Oral hypoglycemic agen	Power point presentatio	Witten and oral examination

10	3	Understanding the basics of specific medications	Anti-inflammatory drug	Power point presentatio	Witten and oral examination
11	3	Understanding the basics of specific medications	Drugs for RA	Power point presentatio	Witten and oral examination
12	3	Understanding the basics of specific medications	Drugs for Gout	Power point presentatio	Witten and oral examination
13	3	Understanding the basics of specific medications	Cancer chemotherapy	Power point presentatio	Witten and oral examination
14	3	Understanding the basics of specific medications	Cancer chemotherapy	Power point presentatio	Witten and oral examination
15	3	Understanding the basics of specific medications	Cancer chemotherapy	Power point presentatio	Witten and oral examination

No.	Lesson Subject	Ref.	Hours
1			

2			
3			
4			
5			
6			
7			

3. Course evaluation
   30 marks for theory (midterm exam + quizzes)
   70 marks for the final exam (theory only)
   Total: 100 marks

4. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lipincott Pharmacology; Latest edition.
Main references (sources)	Basic and Clinical Pharmacology 15th edition
Recommended books and references (scientific journals, reports...)	Crash Course Pharmacology, Pharmacology of Essential Medicines
Electronic References, Websites	PubMed (https://pubmed.ncbi.nlm.nih.gov/) Medscape (https://www.medscape.com/) Drugs.com, DrugBank, The world's pharmaceuticals

Course Description Form

103. Course Name:
Organic Pharm .Chemistry III
104. Course Code:
105. Semester / Year:
Second Semester – Fourth Stage – 2025-2026
106. Description Preparation Date:
22-6-2025
107. Available Attendance Forms: official
Attendance
108. Number of Credit Hours (Total) / Number of Units (Total)
Total number of hours: 75 hours Total number of units: 4 units
109. Course administrator's name (mention all, if more than one name)
Assistant Lecturer Hamza Fadhil Hamza Email: Hamza.fadhil@gu.edu.iq Assistant Lecturer Hadeel Hussein Email: Hadeel.h.hamza@gu.edu.iq
110. Course Objectives
This course covers pharmaceutical chemistry and the pharmacological properties of therapeutic chemical drugs, with a detailed explanation of the mechanisms of action of anticancer agents, ranging from traditional antineoplastic drugs to modern biopharmaceutical therapies.

The curriculum also provides an in-depth analysis of the main classes of antibacterial agents (including beta-lactam compounds and sulfonamides), and concludes with a general overview of antiviral and antifungal agents.

111. Teaching and Learning Strategies

Lectures

Conducting practical experiments

Reading textbooks

Engaging in scientific discussions

112. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-5	15	Understanding the chemistry of Antineoplastic agents	Antineoplastic agents:alkylating agents; antimetabolites; antibiotics; plants products ;miscellaneous compounds	Lecture	Quiz
6-7	5	Understanding the chemistry of antineoplastic agents	Hormones and related compounds; Future antineoplastic agents; Monoclonal antibodies; Gene therapy of cancer.	Lecture	Quiz
7-10	9	Understanding the chemistry of antibacterials	β- lactam antibiotics (penicillins); β- lactamase inhibitors; cephalosporins and monobactams	Lecture	Quiz
10-12	6	Understanding the chemistry of antibacterials	Aminoglycosides and chloramphenicol; tetracyclines; macrolides; Lincomycins and polypeptides	Lecture	Quiz
12-13	3	Understanding the chemistry of Sulfonamide	Sulfonamides	Lecture	Quiz

		antibacterials			
13-15	5	Understanding the chemistry of Antiviral Agents	Antiviral Agents	Lecture	Quiz
15	2	Understanding the chemistry of Antifungals	Antifungals	Lecture	Quiz

Practical					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understanding the hydrolysis of ceftriaxone Identifying the mechanism of β-lactam ring cleavage Distinguishing laboratory methods for detecting hydrolysis Evaluating drug stability and product quality	Hydrolytic Degradation of Ceftriaxone and Detection of β-Lactam Ring Cleavage	PowerPoint presentation +conducting experiments	Daily exam and oral exam
2	2	Understanding the instability of benzylpenicillin in acidic medium Identifying the mechanism of drug degradation Distinguishing laboratory methods for monitoring degradation	Demonstration of Acidic Instability of Benzylpenicillin (PenicillinG	PowerPoint presentation +conducting experiments	Daily exam and oral exam

		Evaluating the impact of stability on drug efficacy			
3	2	Comparing the stability of azithromycin and erythromycin Understanding the factors affecting drug degradation Identifying laboratory methods for stability assessment Evaluating the impact of stability on drug efficacy and safety	Comparative Stability Study of Azithromycin and Erythromycin	PowerPoint presentation +conducting experiments	Daily exam and oral exam
4	2	Understanding the stability of azithromycin and erythromycin in acidic medium Identifying the mechanism of acid degradation for each drug Evaluating laboratory results for comparison Relating stability to drug effect and efficacy	Comparing the acid stability of Azithromycin and Erythromycin	PowerPoint presentation +conducting experiments	Daily exam and oral exam
5	2	Studying the oral absorption of tetracycline antibiotics in the laboratory	Comparative In Vitro Evaluation of Oral Absorption Potential of Tetracycline	PowerPoint presentation +conducting experiments	Daily exam and oral exam

		Comparing the absorption efficiency among drugs within the class Understanding the factors affecting absorption Relating the evaluation results to therapeutic efficacy and drug safety	Class Antibiotics		
6	2	Understanding the amphoteric nature of tetracycline antibiotics Identifying the drug's behavior in acidic and basic media Relating chemical properties to absorption and stability effects Applying the concept in laboratory analysis and drug efficacy	Demonstration of the Amphoteric Nature of Tetracyclines	PowerPoint presentation +conducting experiments	Daily exam and oral exam
7	2	Understanding the effect of calcium on tetracycline activity inhibition Identifying interactions with milk and antacids Evaluating the impact of these interactions on absorption and efficacy Relating the results to clinical drug guidelines	Simulation of Tetracycline Inactivation by Calcium from Milk and Antacids	PowerPoint presentation +conducting experiments	Daily exam and oral exam

8	2	Understanding the effect of pH on the dissolution of ciprofloxacin Identifying the relationship between dissolution and the risk of crystalluria Evaluating the importance of pH for safety and dosing Relating chemical properties to clinical applications	Effect of pH on the Solubility of Ciprofloxacin and its Clinical Relevance to Crystalluria	PowerPoint presentation +conducting experiments	
9	2	Understanding the ability of quinolones to form complexes with metal ions Identifying the effect of complexation on oral absorption Evaluating interactions with supplements and metal-containing formulations Relating the results to clinical safety and efficacy	Demonstration of Metal Ion Chelation by Quinolones (e.g .,Ciprofloxacin	PowerPoint presentation +conducting experiments	Daily exam and oral exam
31. Course Evaluation					
40 marks for theory (midterm exam + quizzes) 60 marks for the final exam (theory only) Total: 100 marks					
32. Learning and Teaching Resources					

Required textbooks (curricular books if any)	**1)** Foye's Principles of Medicinal Chemistry Roche PhD (Author), S. William PhD Zito 7 th Edition PhD by Victoria PhD F. , College of Pharmacy, Houston Uni, Texas, USA. **2)** Wilson and Gisvolds textbook of organic medicinal and pharmaceutical chemistry, John M. B.; John H.B. (twelfth edition). **3)** An Introduction to Medicinal Chemistry 7th Edition by Graham L. Patrick, University of the West of Scotland, UK 4) For more details, please scan the QR code below: Practical 
Main references (sources)	Wilson and Gisvolds textbook of organic medicinal and pharmaceutical chemistry, John M. B.; John H.B. (twelfth edition).
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

113. Course Name:
Clinical Pharmacy II
114. Course Code:
115. Semester / Year:
Second Semester – Fourth Stage – 2025-2026

116. Description Preparation Date:
٢٠٢٦-٢-١
117. Available Attendance Forms: official
Attendance
118. Number of Credit Hours (Total) / Number of Units (Total)
Total number of hours: 60 hours Total number of units: 3 units
119. Course administrator's name (mention all, if more than one name)
Dr. Atheer Khudair Hamad Email: atheerspace@gmail.com Assistant Lecturer Noor Ahmed Email: Noor.a.hammadi@gu.edu.iq
120. Course Objectives
Course Objectives Developing understanding and acceptance of clinical pharmacy and pharmaceutical care as concepts and applications. Enabling the student to ensure the safe and effective use of medicines in patient care as part of the healthcare team. This course focuses on the philosophy and practice of clinical pharmacy services in hospitals, through which students review common medical problems (clinical cases) and actively participate in various aspects of patient treatment.
121. Teaching and Learning Strategies
Smart board PowerPoint presentations
122. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	To understand	Bone and joint disorders Gout and hyperuricemia	Power point presentation	Witten and oral examination
2	2	To understand	Rheumatoid arthritis	Power point presentatio	Witten and oral examination
3	2	To understand	Osteoporosis	Power point presentatio	Witten and Oral examination
4	2	To understand	Osteoarthritis	Power point presentatio	Witten and oral examination
5	2	To understand	Cardiovascular disorders Hypertension	Power point presentatio	Witten and oral examination
6	2	To understand	Ischemic heart diseases	Power point presentatio	Witten and oral examination

7	2	To understand	**Heart failure**	Power point presentatio	Witten and oral examination
8	2	To understand	Respiratory disorders Asthma	Power point presentatio	Witten and oral examination
9	2	To understand	COPD	Power point presentatio	Witten and oral examination
10	2	To understand	Endocrinologic disorders Diabetes mellitus	Power point presentatio	Witten and oral examination
11	2	To understand	Gastrointestinal disorders	Power point presentatio	Witten and oral examination
12	2	To understand	Infectious diseases Tuberculosis	Power point presentatio	Witten and oral examination
13	2	To understand	Infective meningitis	Power point presentatio	Witten and oral examination
14	2	To understand	Urinary tract infection	Power point presentatio	Witten and oral examination

15	2	To understand	Hematologic disorders Anemia	Power point presentatio	Witten and oral examination

Practical					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
١	٢	Teaching students how to use the drug reference book and extract information from it	Drug information resources part I [General drug information (BNF)	PowerPoint presentation and discussions	exam
٢	٢	Teaching students how to convey patient instructions regarding antihypertensive medications	Cardiovascular drugs part I	PowerPoint presentation and discussions	exam
٣	٢	Teaching students how to convey patient instructions regarding antihypertensive, cardiac, and diuretic medications	Cardiovascular drugs part II	PowerPoint presentation and discussions	exam
٤	٢	Teaching students how to convey patient instructions regarding antibiotics (penicillin)	Antimicrobial drugs part I	PowerPoint presentation and discussions	exam
٥	٢	Teaching students how to convey patient instructions regarding antibiotics	Antimicrobial drugs part II	PowerPoint presentation and discussions	exam
٦	٢	Teaching students how to convey patient	Antimicrobial drugs part III	PowerPoint presentation and discussions	exam

		instructions regarding antibiotics (quinolones)			
٧	٢	Teaching students how to convey patient instructions regarding anemia medications	Drugs for anemia	PowerPoint presentation and discussions	exam
٨	٢	Teaching students how to convey patient instructions regarding asthma medications	Drugs for asthma and COPD	PowerPoint presentation and discussions	exam
٩	٢	Teaching students how to convey patient instructions regarding endocrine medications	Drugs for endocrine system part 1	PowerPoint presentation and discussions	exam
١٠	٢	Teaching students how to convey patient instructions regarding diabetes medications	Drugs for endocrine system part 2	PowerPoint presentation and discussions	exam
١١	٢	Teaching students how to fill out the medication error form and minimize errors	medication error	PowerPoint presentation and discussions	exam
١٢	٢	Teaching students how to convey patient instructions regarding joint medications	Drugs for musculoskeletal part 1	PowerPoint presentation and discussions	exam
١٣	٢	Teaching students how to convey patient instructions regarding muscle relaxant medications	Drugs for musculoskeletal part 2	PowerPoint presentation and discussions	exam
١٤	٢	Teaching students how to convey patient instructions regarding	Drugs for GI disorders	PowerPoint presentation and discussions	exam

		gastrointestinal medications			
١٥	٢	Pharmacy tests and discussions	OSCE	PowerPoint presentation and discussions	exam

33. Course Evaluation
40 marks for theory (midterm exam + quizzes) 60 marks for the final exam (theory only) Total: 100 marks

34. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	ger Walker, Clive Edwards (eds), .Clinical Pharmacy & Therapeutics
Main references (sources)	Roger Walker, Clive Edwards (eds), ClinicalPharmacy & Therapeutics.
Recommended books and references (scientific journals, reports...)	Articles
Electronic References, Websites	World health organization FDA (U.S. Food and Drug Administration)

Course Description Form

123. Course Name:
General Toxicology
124. Course Code:
125. Semester / Year:
Second Semester – Fourth Stage – 2025-2026
126. Description Preparation Date:
1-2-2026
127. Available Attendance Forms: official
Attendance
128. Number of Credit Hours (Total) / Number of Units (Total)
Total number of hours: 60 hours Total number of units: 3 units
129. Course administrator's name (mention all, if more than one name)
Assistant Lecturer Zainab Khalid Ali Zianab.k.ali@edu.com
130. Course Objectives
To study the principle of exposure to different chemicals and environmental factors, their sources, mechanisms of toxic and their risk to human being; it enables students to understand the required measures to protect living organisms again the suspected toxic hazards.
131. Teaching and Learning Strategies
smart board presentation slides Reuesting periodic reports
132. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	To understand	Introduction	Power point presentation	Witten and oral examination
2-3	4	To understand	Carcinogenesis & Mutagenesis	Power point presentatio	Witten and oral examination
4	2	To understand	Toxic Responses of the Liver	Power point presentatio	Witten and oral examination
		To understand	Toxic Responses of the Kidney	Power point presentatio	Witten and oral examination
5-6-7	6	To understand	Toxic Responses of the Respiratory System	Power point presentatio	Witten and oral examination
8-9-10	6	To understand	Toxic Responses of the Heart & Vascular Sysytem	Power point presentatio	Witten and oral

					examination
11-12-13	5	To understand	Toxic Effects of Metals	Power point presentatio	Witten and oral examination
14-15	5	To understand	Toxic Effects of Pesticides	Power point presentatio	Witten and oral examination

Practical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
١	٢	Understand the fundamentals of laboratory tests Learn the principles of toxicological examination Correctly interpret test results Differentiate between common toxic substances Ensure accuracy and safety in laboratory work	Laboratory principle and toxicological screening	Lecture	Daily exam + Discussions
٢	٢	Apply general management strategies for acute and chronic toxicity Identify and respond to toxic exposures effectively	General Management of acute, chronic toxicity	Lecture	Daily exam + Discussions

		Implement safety measures in handling toxic substances			
٣	٢	Tutorials Case presentations Review	Tutorial , case presentation and review	Lecture	Daily exam + Discussions
٤	٢	Evaluation of the lethal dose 50% (LD50)	Evaluation of LD50	Lecture	Daily exam + Discussions
٥	٢	Tutorial and review	Tutorial and review	Lecture	Daily exam + Discussions
٦	٢	Management of aspirin toxicity	Managements of Aspirin toxicity	Lecture	Daily exam + Discussions
٧	٢	Tutorial and review	Tutorial , case presentation and review	Lecture	Daily exam + Discussions
٨	٢	Assessment of Doxorubicin's effect on vascular function using an organ bath system	Assessment of the Toxic Effect of Doxorubicin on Vascular Function Using an Organ Bath System	Lecture	Daily exam + Discussions
٩	٢	Tutorial and review	Tutorial , case presentation and review	Lecture	Daily exam + Discussions
١٠	٢	Management of acetaminophen toxicity	Managements of Acetaminophen toxicity	Lecture	Daily exam + Discussions

١١	٢	Tutorial and review	Tutorial , case presentation and review	Lecture	Daily exam + Discussions
١٢	٢	Management of addiction and withdrawal symptoms	Managements of digoxin toxicity	Lecture	Daily exam + Discussions
١٣	٢	Tutorial and review	Tutorial , case presentation and review	Lecture	Daily exam + Discussions
١٤	٢	Management of addiction and withdrawal symptoms	Managements of adduction , withdrawal symptoms		
١٥	٢	Tutorial and review	Tutorial , case presentation and review	Lecture	Daily exam + Discussions

1. Course Evaluation

20 marks for theory (midterm exam + daily exams) + 20 marks for practical
60 marks for the final exam (theory only)
Total: 100 marks

2. Learning and Teaching Resources

Required textbooks (curricular books, if an	Casarett and Doull, Toxicology, the Basic Science of Poisons; latest edition.
Main references (sources)	
Recommended books and references (scientific journals, reports...)	

Course Description Form

133. Course Name:
Industrial Pharmacy I
134. Course Code:
135. Semester / Year:
Second Semester – Fourth Stage – 2025-2026
136. Description Preparation Date:
٢٠٢٦-٢-١
137. Available Attendance Forms: official
Attendance
138. Number of Credit Hours (Total) / Number of Units (Total)
Total number of hours: 75 hours Total number of units: 4 units
139. Course administrator's name (mention all, if more than one name)
Dr. Ahmed Yaseen alsharea Email: Ahmed.yaseen.alsharea@gau.edu.iq

Assistant Lecturer Qasim Khalid (Practical)

Email: Qasim.khalid@gau.edu.iq

Pharmacist . Hussein Abdul Kareem

Email: iam2048@uomustansiriyah.edu.iq

140. Course Objectives

Course Objectives

1) Understanding the principles and equipment used in mixing, grinding, drying, filtering, and sterilizing pharmaceutical preparations.

2) Identifying appropriate particle size reduction, drying, and sterilization methods based on material properties and product requirements.

3) Explaining packaging types and materials and their role in product stability and protection.

4)Applying current Good Manufacturing Practices (cGMP) in pharmaceutical production and quality control.

141. Teaching and Learning Strategies

- Theoretical lectures.
- Practical experiments.
- Scientific reports.
- Laboratory research training.
- Visiting tours in medical factory.

142. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1-3	9	To Understand	**Mixing (Mixing principles, Definition and objectives of mixing, Types of mixtures, the mixing process, Mechanisms of mixing and demixing, Powder segregation (demixing), Mixing of powders-Powder-mixing equipment, mixing of miscible liquids and Suspensions, Mixing of semisolids) Chapter 11 (Aulton's Pharmaceutics; The Design and Manufacture of Medicines; 6th edition, 2022)**	Power point presentation	Witten and oral examination
4-6	9	To Understand	Milling (Influence of material properties on size reduction-Crack propagation and toughness-Surface hardness- Energy, Influence of size reduction on size distribution, Size reduction methods, Combined impact and attrition methods, Selection of the particle size reduction method, Size separation methods by sedimentation- elutriation, cyclone methods) Chapter 10 (Aulton's Pharmaceutics; The Design and Manufacture of Medicines; 6th edition, 2022)	Power point presentatio	Witten and oral examination
7-9	7	To Understand	Drying (Introduction, drying of wet solids, Moisture content of wet solids, Moisture content of air, Loss of water from wet solids, Types of drying method, Convective drying of wet solids, Conductive drying of wet solids, Radiation drying of wet solids, Drying of solutions and suspensions, Freeze-drying (lyophilization)) Chapter 30 (Aulton's Pharmaceutics; The Design and Manufacture of Medicines; 6th edition, 2022)	Power point presentatio	Witten and oral examination
10-11	3	To Understand	Filtration (Filtration-Types of filtration, Mechanisms of filtration, Factors affecting the rate of filtration, Filtration equipment, Industrial filtration equipment, Centrifugation, Industrial centrifuges) Chapter 25 (Aulton's Pharmaceutics; The Design and Manufacture of Medicines; 6th edition, 2022)	Power point presentatio	Witten and oral examination
11-12	5		Sterilization (Introduction, Need for sterility, Sterilization parameters, D value and Z value, F value, Principles of sterilization processes, Heat sterilization, Principles of steam sterilization,	Power point presentatio	Witten and oral

		To Understand	Principles of dry heat sterilization, Gaseous sterilization, Alkylating and Oxidizing gases, Radiation sterilization, Filtration sterilization, new technologies (Ultrahigh pressure, High-intensity light pulses, Ultrasonication, Gas plasma)) Chapter 16 (Aulton's Pharmaceutics; The Design and Manufacture of Medicines; 6th edition, 2022)		examination
13-14	4	To Understand	Packaging (The pharmaceutical pack, Primary packs, Packaging for product stability, packaging for tamper resistance, Closures, Packaging materials, Glass, Pharmaceutical types of glass and containers, Advantages and limitations of plastics, Rubbers and elastomers, Packaging and regulatory bodies) Chapter 50 (Aulton's Pharmaceutics; The Design and Manufacture of Medicines; 6th edition, 2022)	Power point presentatio	Witten and oral examination
15	8	To Understand	**Current Good Manufacturing Practices (Standards for current GMP, cGMP for finished pharmaceuticals, Organization and Personnel, Building and Facilities, Equipment, Control of equipment, containers and closures, Production and process control, Packaging and labelling control, Holding and distribution, lab control, Records and reports, returned and salvaged drug products, Information technology) Chapter 3 (Pharmaceutical Dosage Forms and Drug Delivery Systems by Howard A. Ansel; 11th edition, 2017)**	Power point presentatio	Witten and oral examination

Practical					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
٢–١	٤	Understand the principle of mixing in pharmacy and its importance. Learn solid–solid mixing: achieving homogeneous	Mixing of pharmaceutical materials, solid-solid mixing, liquid-liquid mixing,		

		distribution and reducing segregation. Understand liquid–liquid mixing: obtaining a homogeneous solution or emulsion. Learn solid–liquid mixing: forming homogeneous suspensions or pastes.	solid–liquid mixing		
٣–٤	٤	Understand rheology and its role in evaluating the properties of pharmaceutical materials. Learn the angle of repose to assess powder flowability. Understand Carr's Index and Hausner Ratio to determine the flowability and compressibility of powders.	Rheology-Angle of repose, Carr's index and Hausner ratio		
٥	٢	Understand the bulk density of powders and its role in evaluating powder properties. Learn the tapping density to determine	Powder density-Tapping density		

		compressibility and flowability of powders. Understand the relationship between density, powder surface area, and its flow properties.			
			Particle size analysis- Sieving method		
٧–٦	٤	Understand particle size analysis and its importance in pharmacy. Learn the sieving method to separate particles according to size. Understand the effect of particle size on pharmaceutical properties such as flowability, dissolution, and stability.	Effervescent granules – fusion method		
٩–٨	٤	Understand effervescent granules and their importance in preparing drinkable solutions. Learn the fusion method to combine active ingredients with base materials to form	Effervescent granules- wet method		

		homogeneous granules. Recognize the advantages: producing cohesive and fast-dissolving granules. Understand practical considerations: avoiding moisture, controlling temperature, and preventing premature reaction with water.			
١١–١٠	٤	Understand effervescent granules and their role in preparing drinkable solutions. Learn the wet method: mixing active ingredients with a binder solution to form a paste, then drying it to obtain homogeneous granules. Recognize the advantages: producing cohesive granules that dissolve easily and quickly. Understand practical considerations: controlling moisture	**Drying-Moisture content calculation-preparing granules by the wet method- then weighing the powders in different periods with application of the MC% law**		

		and temperature to prevent premature reaction with water before use.			
١٣–١٢	٤	Understand the determination of moisture content (MC%) in powders and granules. Learn the preparation of wet granules (Wet Method) before drying. Be able to weigh granules at different intervals during drying to apply the moisture content (MC%) calculation and monitor water loss. Recognize the relationship between drying time, water loss, and granule stability.	Filtration or clarification (Dialysis membrane and or Büchner funnel)		
١٥–١٤	٤	Understand the concept of filtration/clarification in pharmaceutical preparations. Learn the use of a dialysis membrane to	**Drying- Moisture content calculation- preparing granules by the wet method- then weighing the powders in**		

		separate small molecules from large ones through selective permeability. Understand the use of a Büchner funnel for vacuum filtration to quickly obtain clear solutions. Recognize how to select the appropriate filtration method based on particle size and the nature of the sample.	**different periods with application of the MC% law**		

1. Course Evaluation

20 marks for theory (midterm exam + daily exams) + 20 marks for practical
60 marks for the final exam (theory only)
Total: 100 marks

2. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**1)** Aulton's Pharmaceutics; The Design and Manufacture of Medicines; 6th edition, 2022. **2)** Pharmaceutical Dosage Forms and Drug Delivery Systems by Howard A. Ansel; 11th edition, 2017.
Main references (sources)	
Recommended books and references (scientific journals, reports...)	United States Pharmacopeia/ National Formulary

Course Description Form

143. Course Name:
Communication Skills
144. Course Code:
145. Semester / Year:
Second Semester – Fourth Stage – 2025-2026
146. Description Preparation Date:
٢٠٢٦-٢-١
147. Available Attendance Forms: official
Attendance
148. Number of Credit Hours (Total) / Number of Units (Total)
Total number of hours: 30 hours Total number of units: 2 units
149. Course administrator's name (mention all, if more than one name)
Dr. Mohammed Mohsin Shlal Email: Mohammed.mohsin@gu.edu.iq
150. Course Objectives
Course Objectives Communication skills are an essential part of practicing pharmaceutical care, aiming to build a strong relationship between the pharmacist and the patient. This involves exchanging information, maintaining its confidentiality, and using it to improve patient care through appropriate medication

therapy. This course aims to enable pharmacists to provide better patient care, with a focus on the necessary communication skills.

151. Teaching and Learning Strategies

Interactive lectures

Group discussions

Student presentations

152. Course Structure

3. Course Structure (theoretical and practical)

theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
١	٢	Understand the concept of non-verbal communication and its importance in interpersonal interactions. Distinguish between types of non-verbal communication (facial expressions, gestures, body language, tone of voice). Recognize the role of non-verbal communication in enhancing or weakening verbal messages.	Principles and Elements of Interpersonal Communication	Delivering a lecture + presenting slides and educational videos	**Conducting daily exams and discussions through question-and-answer sessions**

		Use non-verbal cues effectively.			
٢	٢	Define non-verbal communication. Identify its main types.	Nonverbal type of communication.	Delivering a lecture + presenting slides and educational videos	**Conducting daily exams and discussions through question-and-answer sessions**
٣	٢	Define communication barriers. Identify their main types. Understand their impact on communication effectiveness.	Barriers to communication.	Delivering a lecture + presenting slides and educational videos	**Conducting daily exams and discussions through question-and-answer sessions**
٤	٢	Define listening and empathetic responding. Understand their importance in communication. Apply them to improve understanding and relationships.	Listening and empathic responding during communication.	Delivering a lecture + presenting slides and educational videos	**Conducting daily exams and discussions through question-and-answer sessions**
٥	٢	Define assertive behavior.	Assertiveness.	Delivering a lecture + presenting slides and	**Conducting daily exams and discussions through question-and-**

		Distinguish it from passive and aggressive behavior. Apply it effectively in communication.		educational videos	**answer sessions**
٦	٢	Define interviewing and assessment. Identify their basic steps. Use them to gather accurate information.	Interviewing and assessment.	Delivering a lecture + presenting slides and educational videos	**Conducting daily exams and discussions through question-and-answer sessions**
٧	٢	Understand the concept of a treatment plan. Help the patient adhere to therapy. Promote independence and improve therapeutic outcomes.	**Helping patients to manage therapeutic regimens**	Delivering a lecture + presenting slides and educational videos	**Conducting daily exams and discussions through question-and-answer sessions**
٨	٢	Define patient counseling. Use the counseling checklist and its steps. Provide information to the patient in an organized and clear manner.	Patient counseling; counseling check list; point-by-point discussion;	Delivering a lecture + presenting slides and educational videos	**Conducting daily exams and discussions through question-and-answer sessions**

٩	٢	Understand the concept of a counseling scenario. Apply counseling skills in practice. Improve caregiver-patient communication.	counseling scenario	Delivering a lecture + presenting slides and educational videos	**Conducting daily exams and discussions through question-and-answer sessions**
١٠	٢	Understand the principles of medication safety. Utilize communication skills to reduce medication errors. Promote the safe and effective use of medicines.	**Medication safety and communication skills**	Delivering a lecture + presenting slides and educational videos	**Conducting daily exams and discussions through question-and-answer sessions**
١١	٢	Identify an individual's special needs. Develop appropriate strategies to meet them. Improve the support and care provided.	**Strategies to meet specific needs**	Delivering a lecture + presenting slides and educational videos	**Conducting daily exams and discussions through question-and-answer sessions**
١٢	٢	Understand methods of communication with children and the elderly. Simplify medication information according to age group.	**Communicating with children and elderly about medications.**	Delivering a lecture + presenting slides and educational videos	**Conducting daily exams and discussions through question-and-answer sessions**

		Promote medication adherence and safety.			
١٣	٢	Develop effective communication skills. Understand the importance of interprofessional collaboration. Improve the quality of care through teamwork.	**Communication skills and inter-professional collaboration**	Delivering a lecture + presenting slides and educational videos	**Conducting daily exams and discussions through question-and-answer sessions**
١٤	٢	Understand electronic communication tools in healthcare. Use digital technologies to transmit medical information securely. Enhance the efficiency and speed of communication between healthcare providers and patients.	**Electronic communication in healthcare.**	Delivering a lecture + presenting slides and educational videos	**Conducting daily exams and discussions through question-and-answer sessions**
١٥	٢	Understand ethical principles in patient communication. Respect privacy and confidentiality. Promote trust and professionalism during patient interactions.	**Ethical behavior when communicating with patients,**	Delivering a lecture + presenting slides and educational videos	**Conducting daily exams and discussions through question-and-answer sessions**

	١	Understand the basics of travel health. Identify health risks associated with travel. Provide preventive advice and guidance to travelers.	**Travel health**	Delivering a lecture + presenting slides and educational videos	
	١	Understand the concept of health insurance. Learn about types of coverage and included services. Use insurance to improve access to healthcare.	**Health insurance**	Delivering a lecture + presenting slides and educational videos	
Practical					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

4. Course Evaluation	
30 marks for theory (midterm exam + quizzes) 70 marks for the final exam (theory only) Total: 100 marks	
5. Learning and Teaching Resources	
Required textbooks (curricu books, if any)	Robert S. B., Carole L. K., William N. T., Communication Skills in Pharmacy Practice, 5th edition,2007, Lippincott Williams & Wilkins
Main references (sources)	Bruce A. B., Communication Skills for Pharmacists; American Pharmacists Association; 2nd edition, 2005
Recommended books and references (scientific journals, reports...)	-Robert S. Beardsley, (ed.); Communication Skills in Pharmacy Practice.