Course Description Form

1. Course Name:

Analytical chemistry (Theoretical+ Practical)

2. Course Code:

Phpch25-111

3. Semester / Year:

First semester/2025-2026

4. Description Preparation Date:

15/1/2026

5. Available Attendance Forms:

Students' signature on attendance sheet

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

3 hours Theoretical + 2 hours Practical (75) /4 units

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

Theoretical

Name: Dr. Aws Maseer Nejres
Email: aws.m.nejres@uomosul.edu.iq
Name:Dr. wallada hameed Ibrahem
Email: wallada.h@uomosul.edu.iq

Practical

Name: Nada Ahmed
Email: nadaahmed199238@uomosul.edu.iq
Name:Dr. wallada hameed ibrahem
Email: wallada.h@uomosul.edu.iq

8. Course Objectives

Course Objectives	Preparing students and supporting them with information related to qualitativeand quantitative chemical analyzes and studying the theories related to that.

9. Teaching and Learning Strategies

Strategy	Lecturing Seminars Homework Quiz Mid-term & final exams

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	Introduction to Analytical Chemistry: Types and roles in drug development and QC	By the end of this course, students will able to: Understand t fundamentals of classical and instrumental analytic techniques.	Theoretical lectures. Practical (Laboratory safety rules)	Paper-based exams

2	2+2	Review of Basic Concepts: Concentration units, standards, solution preparation	By the end of this course, students will be able to: Understand the fundamentals of classical and instrumental analytical techniques.	Theoretical lectures. Practical(Glass ware laboratory)	Paper-based exams
3	3+2	Gravimetric Analysis: Precipitation, weighing, error sources	By the end of this course, students will be able to: Understand the fundamentals of classical and instrumental analytical techniques.	Theoretical lectures. Practical(Prepare solutions from solids and liquids)	Paper-based exams
4	3+2	Volumetric Analysis I: Acid-base titrations, indicators, pH, calculations	Quantitative analysis	Theoretical lectures. Practical(Titration principles)	Paper-based exams
5	3+2	Volumetric Analysis II: Precipitation and Complexometric titrations (Mohr, EDTA)	Quantitative analysis	Theoretical lectures. Practical (Titration of HCl with sodium Carbonate)	Paper-based exams
6	2+2	The scope of applications of gravimetric analysis: Inorganic precipitating agents; organic precipitating agents	Quantitative analysis	Theoretical lectures. Practical (Titration of HCl with NaOH)	Paper-based exams
7**Mid-term Exam**					
8	2+2	An introduction to volumetric methods of analysis: Volumetric calculations; acid-base equilibria and pH calculations	Quantitative analysis	Theoretical lectures. Practical (Titration ofKMno4with oxalateacide)	Paper-based exams
9	2+2	Introduction to Pharmacopoeias: USP, BP, monographs, specifications	Quantitative analysis	Theoretical lectures. Practical (Titration ofKMno4with oxalateacide)	Paper-based exams
10	3+2	UV-Visible Spectrophotometry: Principles, Beer's Law, applications	Quantitative analysis	Theoretical lectures.	Paper-based exams

				Practical (unknown sample determination)	
11	3+2	Statistical Evaluation of Data: Mean, SD, confidence limits, Q-test, Grubbs test	Quantitative analysis	Theoretical lectures. Practical (Titration ofKmno4withferrous sulfate)	Paper-based exams
12	3+2	Redox Titrations: Principles, iodometry, permanganometry	Quantitative analysis	Theoretical lectures. Practical (Determination of chloride by Mohr method)	Paper-based exams
13	3+2	Electrochemical Methods: Potentiometry, Conductometry	Quantitative analysis	Theoretical lectures. Practical (unknown sample determination)	Paper-based exams
14	3+2	Introduction to Chromatography: TLC, paper chromatography	Quantitative analysis	Theoretical lectures. Practical (Determination of water hardness)	Paper-based exams
15	**Final Exam**				

11.Course Evaluation

- 20 Marks… Theoretical assessment;
  (paper-based mid-term exam + quiz + attendance + seminars)
- 20 Marks… practical assessment (attendance + quiz + practice+unknown sample assessment)
- 60 Marks… paper-based theoretical final exam

Total 100 Marks

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	1) Fundamentals of Analytical Chemistry – Skoog, West, Holler & Crouch 2) Pharmaceutical Analysis – A.H. Beckett & J.B. Stenlake 3) Quantitative Chemical Analysis – Daniel C. Harris 4) Supplementary: British Pharmacopoeia (BP), United States Pharmacopeia (USP), ICH Q2(R1)
Main references (sources)	Modern Pharmaceutical Drug Analysis, by L. Zechmeister)

	And L. Von.Cholnoky, ISBN (13): 978-81-224-2718-9
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:

Biostatistics

2. Course Code:

Phcls25-113-

3. Semester / Year:

First semester/2025-2026

4. Description Preparation Date:

1/09/2025

5. Available Attendance Forms:

Students' signature on attendance sheet

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

2 hours Theoretical (30 total) / 2 units

7. Course administrator's name

Theoretical

Name: Dr. Teacher, Safaa Mohamed Zaki
Email: hasanmobsher@uomsul.edu.iq
Name: Assistant teacher, Ghassan Ahmad Ismaeel
Email: hasanmobsher@uomsul.edu.iq
Name: Assistant teacher, Hasan Mobsher Ibrahim
Email: hasanmobsher@uomsul.edu.iq
Name: Assistant teacher, Omar Najeeb Ahmed
Email: Omarnajeeb@uomsul.edu.iq

Practical

Name:
Email:

8. Course Objectives

Course Objectives Learn about advanced statistics general, biostatistics in particular, tests related to the medical aspect	• Knowledge of the biostatistician aspect, description variables, and dealing with various statistical tests.

9. Teaching and Learning Strategies

Strategy	Lecturing External resources via classroom Seminars Homework Quiz Reports

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	4	**A1:** To explain basic concepts of statistics	Introduction to statistics	Theoretical lectures.	Paper-based exams
3-4	4	**B1:** Apply basic concepts of integration and differentiation **C1:** To adhere to definitions of	Definition Integration and differentiation	Theoretical lectures.	Paper-based exams

		integration and differentiation			
5-6	4	**A1:** To explain basic concepts in application of the area under the curve. **B2:** To analyze simple cases	Definition of Applications the area under curve	Theoretical lectures.	Paper-based exams
7-8	3	**A2:** To differentiate samples and convidence intervals **B2:** To analyze clinical cases of convidence intervals	Definition of samples and Definition of confidence interva	Theoretical lectures.	Paper-based exams
9	3	**A1:** To explain basic concepts of dependent and independent variables	Definition of Dependent and independent variables	Theoretical lectures.	Paper-based exams
		Mid-term exam			
10- 11	3	**A1:** To explain basic concepts in correlation and regression	Definition and Applications of Correlation and regression	Theoretical lectures.	Paper-based exams
12	3	**A2:** To differentiate one-sample and two sample variables **B2:** To analyze clinical cases	Definition and Applications of One-sample tests and Two-sample tests	Theoretical lectures.	Paper-based exams
13	2	**A2:** To differentiate various analysis of variance tests **B2:** To analyze clinical cases	Definition and Applications of Analysis of varian tests	Theoretical lectures.	Paper-based exams
14	2	**A1:** To explain basic concepts in domain and non-normal distribution	Definition and Applications of Choices in the domain of non-normal distributio	Theoretical lectures.	Paper-based exams
15	2	**A2:** To differentiate various Correlation test for categorical variables **B2:** To analyze clinical cases	Definition and Applications of Correlation test fo categorical variabl	Theoretical lectures.	Paper-based exams
15	**General test**				

11. Course Evaluation

- _30 M Theoretical assessment;
  (paper-based mid-term exam + quiz + attendance + seminar)
- 70 M paper-based theoretical final exam

100 M total	
12. Learning and Teaching Resources	
Required textbooks	1. Thomas GB, Finny RI. Calculus and Analyt Geometry. 9th edition, 2009. 2. Daniel WW. Biostatistics: A Foundation for Analysis in the Health Science, 10th edition, 2013, wiley.
Main references (sources)	1-Introductory Biostatistics for the Health Sciences, by Michael R. Chernick. 2. introduction statistics using SPSS, Sec Edition, by Hersschel Knapp.
Electronic References, Websites	You tube Others
Curriculum development	Teaching students the principles of scientific research

Course Description Form

1. Course Name:	
Democracy and Human Rights (Theoretical)	
2. Course Code:	
Phcls25_116-	
3. Semester / Year:	
First semester/ 2025-2026	
4. Description Preparation Date:	
01/09/2025	
5. Available Attendance Forms:	
Students' signature on attendance sheet	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 hours a week (30 h total)\ 2 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant lecturer. Ali Mohammed Ghareeb Abdulrahman Email: ali_alhilaly@uomosul.edu.iq Name: Assist Lecturer Ali Thamer Email Ali.thamer@uomosul.edu.iq Assistant lecturer: Noor Imad Adel	
8. Course Objectives	
Course Objectives	• Identifying the development and historical origins of the concept of democracy and its types, and methods of diagnosing the reasons for the decline of its practice in the political systems of countries and how to solve it. • Identifying the components and characteristics of democracy and laying its correct foundations in the political systems of countries, in order to ensure that its citizens enjoy its outcomes and arm themselves with the force of law to defend the privileges emanating from it and build a free society that believes in its full and undiminished rights and the duties entrusted to it in order to protect the political system from decay and chaos. • Identify the most important relationship between democracy, human rights, and civil society institutions, through influence and influence among them, and what are the outcomes and results of these relationships, and how they contribute to building a democratic society in which the political system guarantees public rights and freedoms. • Enabling individuals to participate effectively in choosing the form of government that achieves the foundations of coexistence, understanding, tolerance and respect among the people of one people with their various ideological, religious, linguistic and ethnic orientations.
9. Teaching and Learning Strategies	
Strategy	• Explain • Brainstorming • Dialogue and discussion

	• Quiz

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	**A1:** To explain basic concepts of democracy	The concept and history of democracy	Theoretical lectures	Question and Answer
2	2	**B1:** Apply basic concepts of democracy	Characteristics of the democratic system and its components	Theoretical lectures	Question and Answer + Quiz
3	2	**B1:** Apply basic understanding of constitution	The Constitution	Theoretical lectures	Question and Answer
4	2	**A1:** To explain basic concepts of Constitution and democracy	Constitution and democracy	Theoretical lectures	Question and Answer + Quiz
5	2	**A2:** To differentiate between the different types of election	The elections	Theoretical lectures	Question and Answer
6	2	**A1:** To explain basic concepts of the institutions of civil society	Institutions of civil society	Theoretical lectures	Question and Answer
7	2	**B2:** To analyze the relationship between civil society institutions and democracy	The relationship between civil society institutions and democracy	Theoretical lectures	Question and Answer + Quiz
8	**Mid-term exam**				
9	2	**B3:** To apply the concept of human rights and its development	The concept of human rights and its development	Theoretical lectures	Question and Answer
10	2	A1: to understand Human rights in international constitutions and the Iraqi constitution	Human rights in international constitutions and the Iraqi constitution	Theoretical lectures	Question and Answer

11	2	**A1:** To explain relationship between human rights and democracy	The relationship between human rights and democracy	Theoretical lectures	Question and Answer
12	2	**B2:** To analyze the genocide crimes	Genocide crimes	Theoretical lectures	Question and Answer
13	2	A1: to explain public freedoms and rights	Guarantees of public freedoms and rights	Theoretical lectures	Question and Answer
14	2	B2: to analyze the good governance	Good governance	Theoretical lectures	Question and Answer
15	2	B2: To analyze contemporary democracy	Contemporary democracy	Theoretical lectures	Question and Answer
16	**Final- term exam**				

11. Course Evaluation

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

- 30 M Theoretical assessment;
  (attendance + Participate in the general discussion (Question and Answer) + quiz + paper-based mid-term exam)
- 70 M paper-based theoretical final exam

Total 100 M

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Nothing
Main references (sources)	• Dr. Ghassan Karim Majthab and Dr. Amjad Zein Al-Abidin Tumaa, Human Rights and Democracy, 2018. • Zuwaina Al-Walid, The Crime of Genocide in Light of the Jurisprudence of the International Criminal Court for Rwanda, unpublished master's thesis, (University of Algiers, Faculty of Law, Ben Aknoun, 2013). • David Beetham and Kevin Boyle, Introduction to Democracy: Free and Fair Elections, translated by: Ghareeb Awadh, (Bahrain, Fradis Publishing and Distribution House, 2007). • Constitution of Iraq of 2005.
Recommended books and references (scientific journals, reports...)	• Mohamed Gharbi, Democracy and Good Governance: Challenges for Political Participation and Achieving Development, Special Issue, (Algeria, Journal of Politics and Law Notebooks, April 2011).
Electronic References, Websites	• United Nations Universal Declaration of Human Rights 1948, https://www.supremecourt.ge

Curriculum development	• 5%

Course Description Form

1. Course Name:
Human Anatomy and Histology
2. Course Code:
Phcls25_112-
3. Semester / Year:
1st Semester/1st year
4. Description Preparation Date:
1/9/2025
5. Available Attendance Forms:
Sheets signed by students
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theory + 2 hours Practical/ 4 unites
7. Course administrator's name
Theoretical
Name: Assis. Prof. Dr. Farah Hazim Email: farahomer@uomosul.edu.iq Name: Assis. Prof. Dr. Mohammed Abullaa Ajeel Email: mohammed91@uomosul.edu.iq Name : Ahmed Mohammed Ibrahim . Email : drahmedmias@uomosul.edu.iq
Practical
Dr. Esraa Mohammed Adel Shareef Email: Hakam.22@uomosul.edu.iq Assist Lec. Islam khalid kamal Email: Islam.khalid@uomosul.edu.iq Assis. Lec. Sabah Subhi Ismael Email: sabah.barani@uomosul.edu.iq Lec.Ahmed mohammed , drahmedmias@uomosul.edu.iq Abeer Mudhaffar, abeer.hatem@uomosul.edu.iq
8. Course Objectives

Course Objective	To study the histological and anatomical structure of the human body. It is meant primarily to give the student a foundation for advanced study in health care, physiology, pathology, and other fields related to health and fitness. At the end of the course the student should be familiar with the histological and anatomical description of the human body (Normal Organs and systems).
9. Teaching and Learning Strategies	
Strategy	Theoretical parts: Lecture in classroom +discussion and oral questions+ Discussion and written question through Google classroom. Practical part: Explain work principles+ Applying the lab examinations + making weekly reports + written and practical quiz.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1: To explain the major definitions of circulatory system	Circulatory system(hea	Theory& practical	Exam
2	4	B1: To apply the role of epithelial tissue	Epithelial tissue	Theory& practical	Exam
3	4	A1: to understand lymphoid tissue	Lymphoid tissue	Theory& practical	Exam
4	4	A1: To explain the major concepts in connective tissue	Connective tissue	Theory& practical	Exam
5	4	B2: to analyze central nervous system	Central Nervous system	Theory& practical	Exam
6	4	A1: to understanding the major roles of peripheral nervous system	Peripheral nervous syst	Theory& practical	Exam
7	4	A1: to explain major fundamentals of respiratory system	Respiratory system	Theory& practical	Exam
8	4	A1: to explain major fundamentals of digestive system	Digestive system parts& job	Theory& practical	Exam
9	4	B1: to apply major digestive system glands	Digestive system with glands	Theory& practical	Exam
10	4	B1: to apply major role pituitary gland	Endocrine system: pituitary gland	Theory& practical	Exam
11	4	B2: to analyze major role Adrenal, Thyroid, and Parathyroid glands	Endocrine syste Adrenal, Thyro Parathyroid	Theory& practical	Exam
12	4	B2: to analyze Male reproductive system/ Excretory genital glands	Male reproductive syste Excretory genital gland	Theory& practical	Exam
13	4	A1: to understand Female reproductive system	Female reproduct system	Theory& practical	Exam
14	4	B2: to analyze major considerations of Urinary tract system	Urinary tract system:	Theory& practical	Exam
15	4	A1: To explain the skin	The skin: Thick & T skin	Theory& practical	Exam

11. Course Evaluation
• 20 M Theoretical assessment; (paper-based mid-term exam + quiz + attendance) • 20 M practical assessment (attendance + quiz + practice) • 60 M paper-based theoretical final exam 100 M total

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Anatomy and Physiology for Healthcare by Paul Marshall; Beverly Gallacher; Jim Jolly; Shupikai Rinomhota Atlas of Human Anatomy by Frank H. Netter Basic Histology: text and Atlas, 11th ed. BY Luiz Carlos, Uchoa Junqueria
Main references (sources)	Wheaters functional histology: a text and colour atlas 6th ed. BY Yung , Barbara
Web sites	https://histologyguide.com
Updating syllabus	5%

Course Description Form

1.Course Name:
Medical Physics
2.Course Code:
Phcls25-115
3.Semester / Year:
First semester/2025
4.Description Preparation Date:
01. 9.2025
5.Available Attendance Forms:
Theoretical Lectures/Practical Laboratory
6.Number of Credit Hours (Total) / Number of Units (Total)
3/2
7.Course administrator's name
Theoretical
Name: Dr.Mohammed Najim Abed m.n.abed@uomosul.edu.iq Sarah yahya abdulkhaleq yahya sarah.albagooa@uomosul.edu.iq Dr. Manal A. Ibrahim alfarhamanal@uomosul.edu.iq Dr.Zahraa Sedeeq Qasim pharm.zahraa@uomosul.edu.iq Abeer mothafar hatem latef abeer.hatem@uomosul.edu.iq
Practical
Name: Dr.Mohammed Najim Abed m.n.abed@uomosul.edu.iq Sarah yahya abdulkhaleq yahya sarah.albagooa@uomosul.edu.iq Dr. Manal A. Ibrahim alfarhamanal@uomosul.edu.iq Dr.Zahraa Sedeeq Qasim pharm.zahraa@uomosul.edu.iq Abeer mothafar hatem latef abeer.hatem@uomosul.edu.iq

8. Course Objectives	
Course Objectives	1. Concepts of basic physics. 2. Application of physics in medical fields. 3. Principles of some medical devices working

9. Teaching and Learning Strategies	
Strategy	Interactive lectures (and enrichment links via the online classroom). Practical laboratory experiments (enhance applied skills). Classroom discussions and case analyses (stimulate critical thinking and connect concepts). Student presentations (enhance self-directed learning). Homework.

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1 Theory	A1:The student explains matter properties and Charles's gas law	Matter and Charles law.	Theoretical lectures	Paper-based exams
	2 pract.	B1: That the are student constructs precise scientific graphs and reports.	Explain how to plot a graph and make a laboratory report	laboratory work	Report
2	1 Theory	A2: That the student distinguishes between heat and energy in medicine.	Temperature in medicine, Heat and energy	Theoretical lectures	Paper-based exams
	2 pract.	B2: That the student calculates the acceleration of gravity using a pendulum.	Simple pendulum	laboratory work	Report
3	1 Theory	A3: That the student describes the diffusion mechanism and its drug effect.	Diffusion	Theoretical lectures	Paper-based exams
	2 pract.	That the student measures the focal length of a convex lens	The focal length of convex lens	laboratory work	Report
4	1 Theory	A4: That the student analyzes the basic laws of thermodynamics.	thermodynamics	Theoretical lectures	Paper-based exams
	2 pract.	B4: The student calculates the viscosity of liquids	the viscosity of a liquid	laboratory work	Report
5	1 Theory	A5: That the student interprets the components of the ECG cycle.	Electrocardiogram ECG	Theoretical lectures	Paper-based exams
	2 pract.	B5: That the student estimates the speed of sound waves.	Speed of sound	laboratory work	
6	1 Theory	A6: That the student applies Kirchhoff and Planck radiation laws.	Radiation: terms & law (Kirshoffs law; planks law; Stefan-Boltzman law; Wiens law)	Theoretical lectures laboratory work	Paper-based exams
	4 pract.	B6:That the student plots the radioactive decay curve and half-life	Study the Decay curve and find the half-life of water	laboratory work	Report

7	1 Theory	A7: That the student illustrates electromagnetic waves and optics.	Electromagnetic waves; Maxwell equations; physical optics	Theoretical lectures	Paper-based exams
	2 pract.	B7: That the student quantifies the loss in optical fibers due to bending.	Optical Fiber Loss (bend) Measurement	laboratory work	Report
8	1 Theory	A8: That the student outlines the operation of CT scan imaging.	Computed Tomography CT scan	Theoretical lectures	Paper-based exams
	2 pract.	B8: That the student examines drug purity using a spectrophotometer.	Spectrophotometer	laboratory work	Report
9	1 Theory	A9: That the student evaluates the function of cardiac pacemakers.	Implantable Cardiac Pacemakers	Theoretical lectures	Paper-based exams
	4 pract.	B9: That the student computes the surface tension of medical liquids	Measuring surface tension (differential height capillary method)	laboratory work	Report
10	2 Theory	A10: That the student demonstrates the use of glucose monitoring devices.	Medical Devices for: Blood Glucose Monitoring ,Parenteral Infusion Devices , Cardiac Output Measurement	Theoretical lectures	Seminar
	2 pract.	B10: That the student calculates the density of various liquid formulations.	Calculate the density of liquids	laboratory work	Report
11	2 Theory	A11: That the student identifies X-ray spectra and their biological effects.	X-Ray and X-Ray spectra; absorption of X-Ray; U.V and IR effects; medical and biological effects of radiation	Theoretical lectures	Paper-based exams
	4 pract.	B11: That the student compares densities of two liquids using a loaded tube.	Comparing the densities of two liquids	Theoretical lectures	Report
12	1 Theory	A12: That the student analyzes the electrical activity of the brain (EEG	Electroencephalography EEG	Theoretical lectures description	Seminar

13	1 theory	A13: That the student contrasts MRI with other medical imaging techniques.	Magnetic Resonance Imaging MRI	Theoretical lectures	Paper-based exams
	2 Pract.	B12: That the student measures the local atmospheric pressure	Calculating atmospheric pressure	laboratory work	Report

Course Evaluation	
Mid-Term Theoretical Exam20 Marks(Paper-based mid-term exam) Practical Assessment20 Marks (Includes: Attendance, quizzes, and practical laboratory training) Final Theoretical Exam60 Marks 100	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Callister Jr, W. D., & Rethwisch, D. G. (2020). *Materials science and engineering: an introduction*. John wiley & sons. Davidovits, P. (2024). *Physics in biology and medicine*. Elsevier. Armitage E. Practical Physics in S.I.2nd edition, 2009, John Murray, London
Main references (sources)	Callister Jr, W. D., & Rethwisch, D. G. (2020). *Materials science and engineering: an introduction*. John wiley & sons. Davidovits, P. (2024). *Physics in biology and medicine*. Elsevier. Armitage E. Practical Physics in S.I.2nd edition, 2009, John Murray, London

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

Course Description Form

1. Course Name:

Medical Terminology

2. Course Code:

PhPht25- 114

3. Semester / Year:

2025-2026

4. Description Preparation Date:

1/10/2025

5. Available Attendance Forms:

Excel sheets

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

10 hours/ 1Unit

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

Name: Dr. Mohammed Nathem Mohammed Ali Saarti
Email: mohammedpharma79@uomosul.edu.iq

Name: assisstant lecturer Shahad Mohsin
Email: shahadmohsin@uomosul.edu.iq

8. Course Objectives

Course Objective	1-Recognize and understand basic medical terms. 2-Identify and decipher medical abbreviations. 3-Spell and pronounce basic medical terminology. 4-Analyze unfamiliar terms using the knowledge of word roots, suffix and prefixes gained in the course.

9.Teaching and Learning Strategies

Strategy	1- Lectures and interactive presentations 2- Self-directed learning and research projects 3- Interactive workshop and seminars 4- Assessment strategies

10.Course Structure

Week	Hour	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	A1: Students recognize the most common medical abbreviations and symbols. B1: Students analyze the rules of w formation and the role of combining vowels.	General Introduction the Science Medical Ter	• Interactive lectures • Dialogue and discussion • Self-learning	• Quizzes & Exams • Discussions

2	1	**A2:** Students explain the meaning o new word after adding a prefix and compare it with the original meanin **B1:** Students analyze the effect of prefixes in changing meaning from positive to negative (e.g., *happy → unhappy*).	prefixes	• Interactive lectures • Dialogue and discussion • Self-learning	• Quizzes & Exams • Discussions
3	1	**A1:** Students differentiate between suffixes related to nouns (e.g., *-itis, ology*) and those related to verbs/adjectives (e.g., *-ic, -al*). **B1:** Students analyze medical terms containing different suffixes in clini contexts.	suffixes	• Interactive lectures • Dialogue and discussion • Self-learning	• Quizzes & Exams • Discussions
4	1	**A1:** Students identify the most important roots, pr joints, and lymphatic system. **B1:** Students analyze medical terminology related to diagnostic and therapeutic procedures of the lymphatic and skeletal systems.	Bone and jo Lymphatic system	• Interactive lectures • Dialogue and discussion • Self-learning	• Quizzes & Exams • Discussions
		Mid-term exam			
5	1	**A1:** Students identify roots, prefixes Students interpret terms related to diagnostic and **C1:** Students apply cardiovascular terminology to describe clinical cases.	Cardiovascu system	• Interactive lectures • Dialogue and discussion • Self-learning	• Quizzes & Exams • Discussions
6	1	**A1:** Students identify major roots, prefixes, and suffixes related to the central nervous system. **A2:** Students interpret medical term for diagnostic and therapeutic procedures (e.g., *MRI, lumbar puncture, EEG*). **B1:** Students distinguish between te referring to nervous structures and related functions. **C1:** Students pronounce and write CNS medical terminology accurate	Central Nervous system	• Interactive lectures • Dialogue and discussion • Self-learning	• Quizzes & Exams • Discussions
7	2	**A1:** Students identify roots, prefixe and suffixes related to gastrointestin medical terminology. **A2:** Students interpret terms related diagnostic and therapeutic procedur (e.g., *endoscopy*). **C1:** Students apply gastrointestinal terminology to describe clinical cas	Gastrointest system	• Interactive lectures • Dialogue and discussion • Self-learning	• Quizzes & Exams • Discussions
8	2	**A1:** Students recognize the anatomi pharynx, larynx, trachea, bronchi, lungs). **A2:** Students interpret medical terms for diagnostic and therapeutic procedures of the respiratory system (e.g., *spirometry, bronchoscopy, thoracentesis*). **B1:** Students analyze terminology related to respiratory disorders (e.g., *asthma, pneumonia, bronchitis*).	Respiratory system	• Interactive lectures • Dialogue and discussion • Self-learning	• Quizzes & Exams • Discussions
		Final exam			

11.Course Evaluation

Evaluation breakdown for a total score of 100%: quizzes (5%); midterm exam (25%) and final exam (70%).

12.Learning and Teaching Resources

Required textbooks (curricu books, if any)	Medical Terminology: A Living Language (4th Edition) - Softcover Fremgen, Bonnie F.; Frucht, Suzanne S.
Main references (sources)	Medical Terminology For Dummies: 3rd Edition By Beverley Henderson, 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).
Electronic References, Websites	https://www.schulich.uwo.ca/pathol//about_us/resources/glossa of_medical_terms.html

Course Description Form

1. Course Name:
Physiology I (Theoretical+ Practical)
2. Course Code:
Phpht25-212
3. Semester / Year:
First semester/2025-2026
4. Description Preparation Date:
01/9/2025
5. Available Attendance Forms:
Students' signature on attendance Excel sheets
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical (75) /4 units
7. Course administrator's name
Theoretical
Assist. Prof Dr. Fawaz A. Alassaf Email: Fawaz.Alassaf@uomosul.edu.iq Lecturer Dr. Mohammed Abdulkareem Younes Email: mohammed-78@uomosul.edu.iq Lecturer Ahmed Hikmat Email: ahmed.alhamdany@uomosul.edu.iq Assist. Lecturer Louay Alchalaby Email: loayalchalaby@uomosul.edu.iq
8. Course Objectives

Course Objectives	Enable students to acquire basic knowledge regarding the functions of the normal body, along with the ability to assess these functions and their relationship to normal and pathological conditions. Additionally, this course aids students in understanding the importance of molecular, biochemical, and cellular mechanisms in maintaining the internal environment stability of the body.

9. Teaching and Learning Strategies	
Strategy	• Lectures and Interactive Presentations • Case-Based Learning • Interactive Workshops and Seminars • Self-Directed Learning and Research Projects • Assessment Strategies • Practical laboratory demonstrations of physiological investigations and experiments in different subjects of physiology.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	A1 student to learn part of C.N.S B2 student to differentiate the difference between the role of each parts & its effect on C.N.S.	Physiology of nerves: Nerve cells; excitation and conduction; Properties of mixed nerves; glia;	Theoretical lectures. Laboratory experiments	Paper-based exams

			neurotrophins; Nerve fiber types and functions		
2	3+2	A2 student understand the role of sympathetic & parasympathetic nervous system B1 student specify the cause of difference due to response.	central regulation of visceral function; the autonomic nervous system	Theoretical lectures. Laboratory demonstration.	Paper-based exams
3	3+2	A1 student to learn the stages of response at different parts of body. A2 student to explain thedifference between the response speed at different body parts.	Synaptic transmission: Reflexes; cutaneous, deep and visceral sensations	Theoretical lectures. Laboratory demonstration.	Paper-based exams
4	3+2	A1 student to learn the function of motor system.	Higher function of the nervous system & motor system	Theoretical lectures. Laboratory demonstration.	Paper-based exams
5	3+2	A1 student to learn the role of C.N.S. in doing function as movement & sleep. C1 student able to give advise to patient suffering from sleep disturbance.	Alert behavior, sleep and electrical activity of the brain; control of posture and movement	Theoretical lectures. Laboratory experiments.	Paper-based exams
6	3+2	A1 student to learn the of renal system. A2 student tounderstand The factors affecting filteration & reabsorption.	Introduction; innervations of the renal vessels; renal clearance; renal blood flow; glomerular filtration rate (GFR) reabsorption of Na^+, Cl^- and glucos	Theoretical lectures. Laboratory demonstration.	Paper-based exams
7	3+2	A1 student to learn the balance between filteration & reabsorption. A2 student to explain the factors affecting glomerulotubular balance	Tubuloglomerular feedback and glomerulotubular balance	Theoretical lectures. Laboratory demonstration.	Paper-based exams
8	3+2	A1 student to learn the balance benefits between the acids & base. B1 student specify the indirect factors affecting balance between the acids & base.	Acid base balance	Theoretical lectures. Laboratory demonstration.	Paper-based exams
9	3+2	A1 student to learn the role of kidney in control acidity. B2 student to	Overcome of acidity and alkalinisation	Theoretical lectures.	Paper-based exams

		differentiate the difference between the role of each parts of body in control acidity.		Laboratory demonstration.	
	Mid-term exam				
10	3+2	A1 student to learn part of C.V.S B1 student specify the role of each parts & its effect on C.V.S.	Cardiovascular physiology, excitation of cardiomiocytes, ECG, cardiac rhythem	Theoretical lectures. Laboratory demonstration.	Paper-based exams
11	3+2	A1 student to learn the work of C.V.S.. A2 student to explain The factors affecting C.V.S. function.	cardiovascular regulatory mechanisms: Local regulatory mechanisms; systemic regulation by the nervous system; systemic regulation by hormones;	Theoretical lectures. Laboratory demonstration.	Paper-based exams
12	3+2	A1 student to learn the role of heart in control pulse. B2 student to differentiate the difference of ECG paper & associated disease .	cardiac arrhythmias; electrographic findings in cardiac diseases; mechanical events of the cardiac cycle; cardiac output;	Theoretical lectures. Laboratory demonstration.	Paper-based exams
13	3+2	A1 student to learn part of respiratory system B1 student specify the role of each parts of respiratory system& its effect on lungs.	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 different parts of the lung	Theoretical lectures. Laboratory demonstration.	Paper-based exams
14	3+2	A1 student to learn process of respiration B1 student specify the role of gases in inspiration & expiration..	Dead space and uneven ventilation; Pulmonary circulation: Pressure, volume, and flow. Gas transport between the lungs and tissue;	Theoretical lectures. Laboratory demonstration.	Paper-based exams
15	3+2	A2 student understand the role of nervous system in controle respiratory system B1 student specify the cause of difference responses due to chemical & non-chemical factors.	Regulation of respiration: Neural control of breathing; Respiratory centers; Regulation of respiratory activity:	Theoretical lectures. Laboratory demonstration.	Paper-based exams

			Chemical factors; non chemical factors		

11. Course Evaluation
• 20 M Theoretical assessment; (paper-based mid-term exam + quiz) • 20 M practical assessment (attendance + quiz + + seminars) • 60 M paper-based theoretical final exam Total 100 M

12. Learning and Teaching Resources	
Required textbooks	• Textbook of Medical Physiology by Guyton AC; latest edition
Main references (sources)	• Vander_s Human Physiology; latest edition • Ganong's review of medical physiology; latest edition
Electronic References, Websites	• **PubMed (**https://pubmed.ncbi.nlm.nih.gov/**)** • **Physiology Online (**https://www.physiologyonline.org/**)** • **PhysiologyWeb (**https://www.physiologyweb.com/**)**

Course Description Form

1. Course Name:

Arabic (Theoretical)

2. Course Code:

Phcls25_1212-

3. Semester / Year:

First semester/ 2025-2026

4. Description Preparation Date:

01/09/2025

5. Available Attendance Forms:

Students' signature on attendance sheet

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

2 hours a week (30 h total)\ 2 units

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

Name: **lecturer. Dr.** Ali Mohammed Ghareeb Abdulrahman
Email: ali_alhilaly@uomosul.edu.iq
Name: **Assistant Lecture.** Noor Emad Adil
Email: noor.emad@uomosul.edu.iq
Name: **Assistant lecturer.** Ali Thamer Wahbi
Email: ali.thamer@uomosul.edu.iq

8. Course Objectives

Course Objectives	• Enhance understanding of Arabic language structures. • Improve writing skills. • Know the grammar so that students can form sentences and communicate with others in a sound and understandable manner.

9. Teaching and Learning Strategies

Strategy	• Explain • Brainstorming • Dialogue and discussion • Quiz

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	**A1:** To explain basic concepts	Course Concept	Theoretical lectures	Question and Answer

		of Arabic language			
2	2	**B1:** Apply basic concepts of Arabic Speech	Arabic Speech (Sections and types)	Theoretical lectures	Question and Answer + Quiz
3	2	**B1:** Apply basic understanding of the Arabic Sentence Construction	Arabic Sentence Construction	Theoretical lectures	Question and Answer
4	2	**A1:** To explain basic concepts of Syntax and its signs	Syntax and its signs	Theoretical lectures	Question and Answer + Quiz
5	2	**A2:** To differentiate between the Spelling phenomena (Types of Haamza)	Spelling phenomena (Types of Haamza)	Theoretical lectures	Question and Answer
6	2	**A1:** To explain basic concepts of the Spelling phenomena (Noon and Tanween, Soft Alpha)	Spelling phenomena (Noon and Tanween, Soft Alpha)	Theoretical lectures	Question and Answer
7	2	**B2:** To analyze the Punctuation	Punctuation	Theoretical lectures	Question and Answer + Quiz
8	**Mid-term exam**				
9	2	**B3:** To apply the concept of Spelling phenomena	Spelling phenomena (T tethered and open)	Theoretical lectures	Question and Answer
10	2	A1: to understand the Spelling phenomena (Soft Alpha, Meanings of prepositions)	Spelling phenomena (Soft Alpha, Meanings of prepositions)	Theoretical lectures	Question and Answer
11	2	**A1:** To explain Linguistic errors	Linguistic errors	Theoretical lectures	Question and Answer
12	2	**B2:** To analyze the Applied tables on Spelling phenomena	Applied tables on Spelling phenomena	Theoretical lectures	Question and Answer

13	2	A1: to explain Applied tables on Punctuation	Applied tables on Punctuation	Theoretical lectures	Question and Answer
14	2	B2: to analyze the Applied tables on Linguistic errors	Applied tables on Linguistic errors	Theoretical lectures	Question and Answer
15	2	B2: To analyze Applied tables on Syntax and its signs	Applied tables on Syntax and its signs	Theoretical lectures	Question and Answer
16	**Final- term exam**				

11.Course Evaluation

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

- **30 M** Theoretical assessment;
  (attendance + Participate in the general discussion (Question and Answer) + quiz + paper-based mid-term exam)
- **70 M** paper-based theoretical final exam

Total **100 M**

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	• Language Standards • Lisan Al Arab • The mediator in the dictionary of meanings • Al , Sahah
Main references (sources)	• The curriculum in grammar and syntax • Dictation and handwriting • Sunni masterpiece
Recommended books and references (scientific journals, reports...)	• Arabic Lessons Collector
Electronic References, Websites	• The mediator in the dictionary of meanings, https://www.almaany.com/ar/dict/ar-ar/
Curriculum development	• 5%

Course Description Form

1. Course Name:
Computer Science I
2. Course Code:
Phcls25_1211-
3. Semester / Year:
2 /2025-2026
4. Description Preparation Date:
1/09/2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3/2
7. Course administrator's name (mention all, if more than one name)
Theoretical
Name: Assist. Lecturer Ghassan Ahmad Ismaeel Email: ghassanaldabbagh@uomosul.edu.iq Name: Lecturer Dr. Safaa Mohammed Zeki Email: safaanawny@uomosul.edu.iq
Practical
Name: Assist. Lecturer Ghassan Ahmad Ismaeel Email: ghassanaldabbagh@uomosul.edu.iq Name: Lecturer Dr. Safaa Mohammed Zeki Email: safaanawny@uomosul.edu.iq Name: Lecturer Dr. Ali Salim Email: alisalim@uomosul.edu.iq Name: Assist. Lecturer Omar Najeeb Email: omarnajeeb@uomosul.edu.iq Name: Assist. Lecturer Hassan Mobasher Email: hasanmobsher@uomosul.edu.iq Name: Assist. Lecturer Zahraa Faris Email: Zahra.faris@uomosul.edu.iq Name: Assist. Lecturer Omar Imad Email: omaremad_gold@uomosul.edu.iq Name: Thaeer Kamal Email: thaeer.kamal@uomosul.edu.iq

8. Course Objectives

Course Objectives	Give the students the most important information about computers and their uses. The students will learn and appreciate computer skills as wel as the most important software (programs) used on the PC. Furthermor learning the hardware and physical components that make up a comput system is crucial. However, the numeral systems show the way to represent or express numbers.

9. Teaching and Learning Strategies

Strategy	Quizzes, practical and theoretical examinations

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Second course					
1	2	A1: Identify fundamental computer concepts including hardware, software, data, and information.	Introduction to computer	Theory and Practical	Practical-based exams and quizzes
2	2	A1: Identify fundamental computer concepts including hardware, software, data, and information.	Computer components 1	Theory and Practical	
3	2	A1: Identify fundamental computer concepts including hardware, software, data, and information.	Computer components 2	Theory and Practical	
4	2	B1: Use operating systems and graphical user interfaces to manage files, folders, and basic system operations.	Operating systems and GUI 1	Practical	
5	2	B1: Use operating systems and graphical user interfaces to manage files, folders, and basic system operations.	Operating systems and GUI 2	Practical	

6	2	B1: Use operating systems and graphical user interfaces to manage files, folders, and basic system operations.	Microsoft word (1)	Practical	
7	2	B1: Use operating systems and graphical user interfaces to manage files, folders, and basic system operations.	Microsoft word (2)	Practical	
8	2	B1: Use operating systems and graphical user interfaces to manage files, folders, and basic system operations.	Tutorial	Practical	
9	2	B1: Use operating systems and graphical user interfaces to manage files, folders, and basic system operations.	Microsoft PowerPoint (1)	Practical	
10	2	B1: Use operating systems and graphical user interfaces to manage files, folders, and basic system operations.	Microsoft PowerPoint (2)	Practical	
11	2	A1: Identify fundamental computer concepts including hardware, software, data, and information.	Numerical system (added lecture)	Theory	
12	2	B2: Explain internet, cloud computing and networking concepts and use web browsers and search engines effectively.	Introduction to internet and web browsers	Theory and Practical	
13	2	B2: Explain internet, cloud computing and networking concepts and use web browsers and search engines effectively.	Introduction to internet and web browsers	Theory and Practical	

14	2	C1: Apply ethical and professional communication practices using email and digital collaboration tools.	Communications and emails	Theory and Practical	
15	2	B2: Explain internet, cloud computing and networking concepts and use web browsers and search engines effectively.	Introduction to cloud computing and services	Theory	

- A numerical systems lecture has been added to the curriculum as a 5% update.

11.Course Evaluation

• 40 M practical assessment (attendance + quizzes + practice)
• 60 M paper-based theoretical final exam

Total 100 M

12.Learning and Teaching Resources

Required textbooks (curricular books)	Computer Science Textbook 8 Windows 10 & MS Office 2016 by Content Team Orange (Author)
Main references (sources)	Lab. Manual for Practical Computer Science adopted by the department.
Electronic References, Websites	YouTube
Curriculum development	Numerical systems

Course Description Form

1. Course Name:
Organic Chemistry I (Theoretical+ Practical)
2. Course Code:
Phpch25_1211
3. Semester / Year:
First Year / Second Semester
4. Description Preparation Date:
15/1/2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical /3 units
7. Course administrator's name (mention all, if more than one name)
Theoretical:
Lecturer Dr. Eman Mahmood Hasan, Email: emanmahmood87@uomosul.edu.iq Lecturer Dr. Banan Borhan Saeed, Email: bananaldewachi@uomosul.edu.iq Lecturer Dr. Nagham M. Zaki Dawood, Email: n3_m3_zmz@uomosul.edu.iq
Practical
Asst. Lecturer Istabrak Mohammed Abdullah, Email: istabrick.mohammed@uomosul.edu.iq Asst. Lecturer Amal Fakhruddin Hamed, Email: amal-aldulaimi@uomosul.edu.iq
8. Course Objectives

Course Objectives	Recognizing organic compounds, their preparation metho basic properties, chemical reactions, and nomenclature metho

9. Teaching and Learning Strategies	
Strategy	Lecturing, Homework, Quiz, Practical laboratory

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3 theoretical	A1- The student explains the b concepts of alkanes in terms of type of bonding, stereochemist isomers, and their uses..	Introduction to Alkanes	Theoretical lectures.	Paper-based exams
	2 practical	B1- The student applies the concepts of basic methods for measuring of melting points. C1- The student adheres to the principles of safety and professional conduct, handling chemicals correctly in the laboratory.	Determination of Melting points.	practical laboratory experiments	Practical exam report

2	3 theoretical	1- The student explains how to name alkanes as well as their preparation methods, reactions and the types of these reactions C2- The student benefits from information given in the lectur name any alkene compound an predicts the product of any reaction given in the daily exar	Nomenclature, preparations, and reacti of alkanes	Theoretical lectures.	Paper-based exams
	2 practical	A2- The student will learn the basic concepts in methods of measuring boiling point. B2- The student will apply chemical safety procedures and professional conduct within the laboratory and handle chemica correctly.	Determination of boiling points.	practical laboratory experiments	Practical exam report
3	3 theoretical	A2- The student recognizes the nature of these compounds in terms of bonding type, stereochemistry, and characteristics, comparing thei activity with open-chain alkane C2- Explains to the student hov name cycloalkanes, their preparation methods, reactions and comparing these reaction types with those of open-chain alkanes. .	Introduction, nomenclature, preparations, and reactions of cycloalkanes.	Theoretical lectures.	Paper-based exams
	2 practical	A2- The student distinguishes between different materials by measuring their melting and boiling points.	Unknown of melting and boiling points.	practical laboratory experiments	Practical exam
4	3 theoretical	A1- The student explains the b concepts of alkenes in terms of bonding type, stereochemistry, isomers, and properties	Introduction to Alkenes	Theoretical lectures.	Paper-based exams Class participation
	2 practical	A2- The student distinguishes between the different types of methods for separating materials. B2- The student analyzes how filtration is used to isolate and separate materials.	Solution and Filtration.	practical laboratory experiments	Practical exam report
5	3 theoretical	C2- The student explains how	Alkenes, nomenclatu	Theoretical	Paper-based

		name alkenes and their various preparation methods and reactions.	preparations, and reactions.	lectures.	exams
	2 practical	B1- The student applies the sublimation method in the separation of materials. C2- The student estimates the quantity produced in the experiment and calculates the percentage of yield.	Sublimation	practical laboratory experiments	Practical exam report
6	3 theoretical	A1- The student explains the b concepts of dienes in terms of classification, nomenclature, preparation methods, and reactions.	Dienes, classificatic nomenclature, preparations, and reactions	Theoretical lectures.	Paper-based exams
	2 practical	The student distinguishes between the different types of methods for separating materials, such as filtration and sublimation.	Unknown of filtration and Sublimation	practical laboratory experiments	Practical exam
7	3 theoretical	A1- The student explains the b concepts of alcohols in terms o classification, nomenclature, preparation methods, and reactions.	Alcohols, classification, nomenclature	Theoretical lectures.	Paper-based exams
	2 practical	B1- The student distinguishes between the different types of methods for purifying material C2- The student applies how to use the recrystallization method to separate, purify, and reduce materials.	Recrystallization	practical laboratory experiments	Practical exam report
8	Midterm exam				
9	3 theoretical	A1- The student explains the b concepts of alcohols in terms o their preparation methods and reactions.	Alcohols, preparations, and reactions	Theoretical lectures.	Paper-based exams
	2 practical	A1- The student estimates the quantity of pure substance by recrystallization	Unknown of Recrystallization	practical laboratory experiments	Practical exam
10	3 theoretical	A1- The student explains the b concepts of alkynes in terms of	Introduction to Alkynes	Theoretical lectures.	Paper-based exams

		stereochemistry, type of bonds benefits of these compounds, a their applications in preparing anti-cancer drugs.			
	2 practical	B1- The student will learn the basic concepts of distillation in purification of materials.	Distillation	practical laboratory experiments	Practical exam report
11	3 theoretical	C2- The student benefits from above information to study the reactions of alkynes in the next lecture.	Nomenclature, preparations, and reactions of alkynes	Theoretical lectures.	Paper-based exams
	2 practical	B1- The student learns about the different types of distillation, including simple distillation. C2- The student applies the basic concepts of simple distillation through a practical experiment	Distillation	practical laboratory experiments	Practical exam report
12	3 theoretical	A1- The student explains the b concepts of ethers in terms of classification, nomenclature, preparation methods, and reactions.	Ethers, classificati nomenclature, preparations, reactions.	Theoretical lectures.	Paper-based exams
	2 practical	B1- The student estimates the quantity of the pure substance simple distillation.	Unknown of Distillation	practical laboratory experiments	Practical exam
13	3 theoretical	A2- The student distinguishes between different types of phe in terms of structure, chemical physical properties, preparatio methods, and reactions. B2- The student explains how name phenol and how to distinguish them from other ty of halide compounds.	Introduction phenol	Theoretical lectures.	Paper-based exams
	2 practical	Q3- The student reviews all the material covered in previous lectures	Review and exam for th who postponed their exams	practical laboratory experiments	Theory and practical exam
14	3 theoretical	A2- The student understands	Stereochemistry	Interactive	Paper-bas

		stereochemistry, its types, nam methods for each type, and hov differentiate between them. B2- The student benefits from above information and studies pharmacological impact of stereochemistry on the human body.		lectures (and enrichment via the online classroom)	exams
	2 practical		Comprehensive exam	A comprehensive exam covering all practical experiments.	Theoretical exam practical exam
15	3 theoretical	B3- Enhancing self-learning.	Student seminar	Interactive lectures (and enrichment via the online classroom)	Theory exam

11. Assessment	
20 marks theoretical 20 marks practical 60 marks final exam Total: 100	
12.. Educational Resources	
Required textbooks (curricular books, if any	1. Morrison RT, Boyd RN. Organic Chemistry. 6th edition ,2008
Main references (sources)	1. Textbook of organic chemistry for pharm students KS Mukheriee
Recommended books and references (scientific journals, reports...)	https://www.abe.pl/en/book/9781642873740/textbook-of-organic-chemistry-for-pharmacy-students
Electronic References, Websites	%5

Course Description Form

1. Course Name:
Pharmaceutical Calculations (Theoretical+ Practical)
2. Course Code:
Phind25 l2l0--
3. Semester / Year:
2nd Semester/1st year
4. Description Preparation Date:
15/01/2026
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical /4 units
7. Course administrator's name
Theoretical
Name: Assist. Lec. Mohmmed Khalid Al-Shaheen Email: mohammed.khalid@uomosul.edu.iq
Practical
Name: Assist. Lec. Mais Salim Saadallah Email: drmais@uomosul.edu.iq
8. Course Objectives
Course Objectives Enable the students for preparing, dispensing reviewing and monitoring medication to ensure the s effective and affordable use of medication
9. Teaching and Learning Strategies
Strategy — Lecturing Seminars Homework Quiz Practical laboratory demonstrations, experimental calculations and Lab book catalogue

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	Identify and describe the essential parts of a prescription Explain the legal and professional requirements of a valid prescription.	Interpretation of prescription or medication orders.	Theoretical lectures. Laboratory experiments	Paper-based exams
2	3+2	Define **measurement systems** and explain their importance in pharmaceutical practice. Compare these systems in terms of units and applications.	Systems of measurement	Theoretical lectures. Laboratory demonstration.	Paper-based exams
3	3+2	Define **density** as mass per unit volume. Define **specific gravity and** Relate specific gravity to density in practical applications.	Density, specific gravity	Theoretical lectures. Laboratory demonstration.	Paper-based exams
4	3+2	Define **specific volume** as the volume occupied by a unit mass of a substance.	specific volume	Theoretical lectures.	Paper-based exams

		Calculate: • Density from mass and volume • Specific gravity from density values • Specific volume from density		Laboratory demonstration.	
5	3+2	Describe different ways of expressing concentration in liquid and solid dosage forms. Define and differentiate between: • Percentage weight in volume (% w/v) • Percentage weight in weight (% w/w) • Percentage volume in volume (% v/v)	Percent strength, ratio strength, and other expressions of concentration	Theoretical lectures. Laboratory experiments.	Paper-based exams
6	3+2	Define **dose**, **dosage regimen**, and **dose interval**. Perform dose calculations	Calculation of doses	Theoretical lectures. Laboratory demonstration.	Paper-based exams
7	3+2	Adjust doses according to patient-specific factors, including: • **Body weight** (mg/kg, g/kg) • **Body surface area (BSA)** • **Age** (pediatric and geriatric considerations)	calculation of dose patient parameters	Theoretical lectures. Laboratory demonstration.	Paper-based exams
8	3+2	Explain the importance of accurate formula adjustment in pharmaceutica compounding. Apply reducing and enlarging formu	Reducing and enlarging formulas	Theoretical lectures. Laboratory demonstratior	Paper-based exams
9	3+2	Define **altering product strength** in pharmaceutical preparations. Describe the advantages of using stock solutions Define **alligation**	Altering product strength, use of stock solutions, and problem solving by alligation	Theoretical lectures. Laboratory demonstration.	Paper-based exams
10	3+2	Define **isotonic solutions** and explain their importance in pharmacy. Differentiate	Isotonic solutions	Theoretical lectures.	Paper-based exams

		between **isotonic, hypertonic, and hypotonic solutions**.		Laboratory demonstration.	
11	3+2	Define **buffer solutions** and explain their role in resisting pH changes. Describe the **importance of buffers** in pharmaceutical formulations	buffer solutions	Theoretical lectures. Laboratory demonstration.	Paper-based exams
12	3+2	Define **electrolytes** and **electrolyte solutions**. Differentiate between **strong and weak electrolytes**. Define **millimole** and milliequivalents as a measure of amount of substance.	Electrolyte solutions (milliequivalents, millimoles and milliosmoles)	Theoretical lectures. Laboratory demonstration.	Paper-based exams
13	3+2	Calculate millimoles and milliequivalents from **mass and molecular weight**	Electrolyte solutions (milliequivalents, millimoles and milliosmoles)	Theoretical lectures. Laboratory demonstration.	Paper-based exams
14	3+2	Define **parenteral dosage forms** and explain their importance. Define **intravenous infusion** and distinguish between: • Continuous infusion • Intermittent infusion	Intravenous infusions, parenteral, admixtures, rate-of-flow calculation	Theoretical lectures. Laboratory demonstration.	Paper-based exams
15	3+2	Define **parenteral admixtures**. Calculate flow rate in: • mL/hour (using infusion pumps) • Drops/minute (manual IV sets)	Intravenous infusions, parenteral, admixtures, rate-of-flow calculation	Theoretical lectures. Laboratory demonstration.	Paper-based exams

11. Course Evaluation

- 20 M Theoretical assessments;
  (paper-based mid-term exam + attendance + seminar)
- 20 M practical assessment (attendance + quiz + practice+ oral-based exam)
- 60 M paper-based theoretical final exam

100 M total

12. Learning and Teaching Resources	
Required textbooks	1. Ansel HC, Stoklosa MJ. Pharmaceutical calculations 13th edition Philadelphia, PA: Lippincott. Williams and Wilkins, 2010 2. Laboratory Manual for Practical Pharmacology adopted by the department.
Main references (sources)	1. Ansel HC, Stoklosa MJ. Pharmaceutical calculations ,10th , 13th edition Philadelphia, PA: Lippincott. Williams and Wilkins, 2010 2. Code of Ethics for Pharmacist. 3. American Pharmaceutical Association
Electronic References, Websites	https://www.pharmacist.com/

Course Description Form

1. Course Name:

Baath's Party Crimes in Iraq (Theoretical)

2. Course Code:

Phcls25_211--

3. Semester / Year:

1st Semester/ 2nd year

4. Description Preparation Date:

01/09/2025

5. Available Attendance Forms:

Students' signature on attendance sheet

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

2 hours a week (30 h total) \ 2 units

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

Name: Assis. Lec. Ali Mohammed Ghareeb Abdulrahman
Email: ali_alhilaly@uomosul.edu.iq
Name: Assis. Lec. Ali Thamer
Email Ali.thamer@uomosul.edu.iq
Assis. Lec. Noor Imad Adel

8. **Course Objectives**

Course Objectives	• Enable the student to learn about local and international laws, especially those dealing with human rights issues and violations committed against them, and raise the level of his legal culture that makes him adopt them to reject these violations, whether inside or outside the state system to which he belongs. • Enable the student to identify the types of crimes committed within the country and distinguish between them and crimes against humanity by identifying their characteristics, foundations and laws that apply to them. • Introducing the laws of the International Criminal Court against humanity, and the laws of the Iraqi Supreme Criminal Court in 2005, documenting the Baath Party regime's violations of humanity during its period of rule.

9. Teaching and Learning Strategies

Strategy	• Explain • Brainstorming • Dialogue and discussion • Quiz

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	**A1:** To explain basic concepts of crimes	Concept and definition of crimes and its sections	Theoretical lectures	Question and Answer

2	2	**B1:** Apply basic concepts of crimes	Position of court law The Iraqi Supreme Criminal Court in 2005, a violation of the regime Resurrection and the most important decisions issued by it	Theoretical lectures	Question and Answer + Quiz
3	2	**B1:** Apply basic understanding of the lecture	Types of international crimes	Theoretical lectures	Question and Answer
4	2	**A1:** To explain basic concepts of crimes	The role of the Baath regime in psychological violations and their effects consequences	Theoretical lectures	Question and Answer + Quiz
5	2	**A2:** To differentiate between the crimes	The role of the Baath regime in Social violations and their effects consequences	Theoretical lectures	Question and Answer
6	2	**A1:** To explain basic concepts of the position of Baath regime	The position of the Baath regime Of religion and religious institutions	Theoretical lectures	Question and Answer
7	2	**B2:** To analyze the violation of Baath against human rights	The role of the Baath regime in violation Human Rights Laws	Theoretical lectures	Question and Answer + Quiz
8	**Mid-term exam**				
9	2	**B3:** To apply the concept of Baath and its violation	Violations of the Baath regime Political and military	Theoretical lectures	Question and Answer
10	2	A1: to understand the environment of Baath regime's violation	The Baath regime's environmental violations in Iraq/ war pollution	Theoretical lectures	Question and Answer
11	2	**A1:** To explain Baath regime's	The Baath regime's	Theoretical lectures	Question and Answer

		environmental violations	environmental violations in Iraq/ destruction of cities and villages		
12	2	**B2:** To analyze the violation of the environment in Iraq	The Baath regime's violations of the environment in Iraq/drying up marshes and orchards	Theoretical lectures	Question and Answer
13	2	A1: to explain legal adjustment for the crimes	Legal and legitimate adjustment For the crime of mass graves	Theoretical lectures	Question and Answer
14	2	B2: to analyze the Baath regime in the events Mass graves in Iraq	The role of the Baath regime in the events Mass graves in Iraq	Theoretical lectures	Question and Answer
15	2	B2: To analyze Legal adaptation of crimes Mass graves during the rule of the Baath regime	Legal adaptation of crimes Mass graves during the rule of the Baath regime	Theoretical lectures	Question and Answer
	Final- term exam				

11. Course Evaluation

- 30 M Theoretical assessment;
  (attendance + Participate in the general discussion (Question and Answer) + quiz + paper-based mid-term exam)
- 70 M paper-based theoretical final exam

100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	• Book: Crimes of the Baath Regime in Iraq, (Iraq, Ministry of Higher Education and Scientific Research, 2023).
Main references (source	• Dr. Ghassan Karim Majthab and Dr. Amjad Zein Al-Abidin Tumaa, Human Rights and Democracy, 2018. • Zuwaina Al-Walid, The Crime of Genocide in Light of the Jurisprudence of the International Criminal Court for Rwanda,

	unpublished master's thesis, (University of Algiers, Faculty of Law, Ben Aknoun, 2013). • Constitution of Iraq of 2005.
Electronic References Websites	• United Nations Universal Declaration of Human Rights 1948, https://www.supremecourt.ge • Iraqi Supreme Criminal Court Law No. (10) of 2005, https://menarights.org/sites/default/files/2016-11/IRQ_Supreme%20Criminal%20Court%20Act_2005_AR_0.pdf • Report: United Nations Legislation in Chapter Four/Crimes against Humanity, 2017, https://legal.un.org/ilc/reports/2017/arabic/chp4.pdf
Course update	• 5%

Course Description Form

1. Course Name:
Computer Science II
2. Course Code:
Phcls25_216-
3. Semester / Year:
1 /2025-2026
4. Description Preparation Date:
1/9/2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3/2
7. Course administrator's name (mention all, if more than one name)
Theoretical
Name: Lecturer Dr. Safaa Mohammed Zeki Email: safaanawny@uomosul.edu.iq Name: Assist. Lecturer Ghassan Ahmad Ismaeel Email: ghassanaldabbagh@uomosul.edu.iq
Practical
Name: Lecturer Dr. Safaa Mohammed Zeki Email: safaanawny@uomosul.edu.iq Name: Assist. Lecturer Ghassan Ahmad Ismaeel Email: ghassanaldabbagh@uomosul.edu.iq Name: Assist. Lecturer Omar Najeeb Email: omarnajeeb@uomosul.edu.iq Name: Assist. Lecturer Hassan Mobasher Email: hasanmobsher@uomosul.edu.iq Name: Lecturer Dr. Ali Salim Email: alisalim@uomosul.edu.iq Name: Assist. Lecturer Zahraa Faris Email: Zahra.faris@uomosul.edu.iq

8. Course Objectives

Course Objectives	In our classroom, students will be able to apply practical technical skills—including presentation delivery, computer troubleshooting, and network security—to real-world scenarios, while building a foundational understanding of e-commerce systems and the core principles of artificial intelligence (AI), its modern applications (such as in smartphones), and the tools used to implement it. Furthermore, you will develop the ability to critically evaluate AI's societal impacts, navigate its ethical challenges, and form an informed perspective on the future of intelligent systems, thereby synthesizing knowledge across technical, functional, and human-centered domains of computing.

9. Teaching and Learning Strategies

Strategy	Quizzes, seminars, practical and theoretical examinations

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	B1: Use effective presentation delivery skills and employ visual and technological aids to support the content.	Presentation skills	Practical	Practical-based exams and quizzes
2	2	A1: Understand the fundamentals of network security, e-commerce, computer troubleshooting with practical application.	Security and networking 1	Practical and theory	
3	2	A1: Understand the fundamentals of network security, e-commerce, computer troubleshooting with practical application.	Security and networking 2	Practical and theory	
4	2	A1: Understand the fundamentals of network security, e-commerce, computer troubleshooting with practical application.	E- commerce	Practical and theory	
5	2	AI: Understand the fundamentals of netw security, e-commerce, and comp troubleshooting with practical application	Computer troubleshooting 1	Practical and theory	
6	2	A1: Understand the fundamentals of network security, e-commerce, computer troubleshooting with practical application.	Computer troubleshooting 2	Practical and theory	
7	2	A2: Explain artificial intelligence concepts, applications, and its role in society, including ethical considerations.	Introduction to AI	Practical and theory	
8	2	A2: Explain artificial intelligence concepts, applications, and its role in society, including ethical considerations.	The role of AI in modern smartphones	Practical and theory	

9	2	A2: Explain artificial intelligence concepts, applications, and its role in society, including ethical considerations.	Applications and tools of AI- 1	Practical and theory	
10	2	A2: Explain artificial intelligence concepts, applications, and its role in society, including ethical considerations.	Applications and tools of AI- 2	Practical and theory	
11	2	A2: Explain artificial intelligence concepts, applications, and its role in society, including ethical considerations.	AI and society	Practical and theory	
12	2	C1: Analyze ethical challenges related to artificial intelligence accountability, and make informed decisions that respect human values.	Ethical challenges In AI	Practical and theory	
13	2	A2: Explain artificial intelligence concepts, applications, and its role in society, including ethical considerations.	The future of AI	Practical and theory	
14	2	B1: Use effective presentation delivery skills and employ visual technological aids to support the content.	Spread sheet (Excel)1	Practical	
15	2	B1: Use effective presentation delivery skills and employ visual technological aids to support the content.	Spread sheet (Excel)2	Practical	

- A Spread sheet (Excel) lectures has been added to the curriculum as a 5% Update.

11.Course Evaluation

• 40 M practical assessment (attendance + quizzes + practice+ seminar)
• 60 M paper-based theoretical final exam

Total 100 M

12.Learning and Teaching Resources

Required textbooks (curricular books)	1- Graham Brown, David W, "Cambridge IGCSE Information Technology", 3rd Edition (2020) 2- Alan Evans, Kendall Martin, Mary Anne Poatsy, "Technology In Action Complete", 16th Edition (2020).
Main references (sources)	Lab. Manual for Practical Computer Science adopted by the department.
Recommended books and references (scientific journals, reports...)	**الخضر علي الخضر/ اساسيات الحاسوب** Ahmed Banafa, "Introduction to Artificial Intellegence (AI)", 1st Edition (2024).
Electronic References, Websites	YouTube

Course Description Form

1. Course Name:
Medical Microbiology I (Theoretical+ Practical)
2. Course Code:
Phcls25 212--
3. Semester / Year:
1st Semester/2nd year
4. Description Preparation Date:
01/9/2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical (75 total) /4 units
7. Course administrator's name
Theoretical
Assist. Prof Dr. Karam Amer Aldabbagh Email: Karam.aldabbagh@uomosul.edu.iq Assist. Prof. Dr. Zahraa Amer Hashim Email: hashimz@uomosul.edu.iq Assist. Prof Maimonah Qasim Yahya Email: pharm.maymona@uomosul.edu.iq
Practical
Lec. Dr. Thekra Sedeeq Email: thekra.siddeq@uomsul.edu.iq Assist. Prof Maimonah Qasim Yahya Email: pharm.maymona@uomosul.edu.iq Dr. Esraa Mohammed Adel Shareef Email: Hakam.22@uomosul.edu.iq Lecturer. Zahraa Sedeeq Qasim Email: Pharm.zahraa@uomosul.edu.iq Assist Lec. Islam khalid kamal Email: Islam.khalid@uomosul.edu.iq Assis. Lec. Ghaith Rabie Mohammed Email: Ghaith.Rabee@uomosul.edu.iq
8. Course Objectives

Course Objectives To know the most common pathogenic bacteria, Knowing mode of transmission, Virulence factors, Pathogenesis and clinical significance Diagnosis, Treatment and Prevention.	• To know the basics of bacteria in te of shape, composition, dy cultivation, microscopic phenomena • To know the identification and gene process of bacteria, in addition sensitivity testing, sterilization, characterization of the detection bacterial diseases.

9. Teaching and Learning Strategies

Strategy	Lecturing External resources via classroom Seminars Homework Quiz Practical laboratory demonstrations, microscopic slides and Lab book catalog

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	3 h theoretical	**A1:** To explain basic concepts in microbiology, including classification of microorganisms, cellular and genetic structure, and mechanisms of pathogenicity.	-Importance of microbiology, History of microbiology -Bacterial Anatomy: morphology and structure	Interactive lectures	Paper-based exams
	2 h practical	**B1:** Apply basic concepts of sterilization, bacterial staining, and sensitivity testing; performs laboratory experiments accurately and safely. **C1:** To adhere to biosafety procedures and professional conduct in the laboratory.	Methods of sterilization	Laboratory demonstration.	Practical exam, report
2	3 h theoretical	**A1:** To explain basic concepts in microbiology, including classification of microorganisms, cellular and genetic structure, and mechanisms of pathogenicity. **B2:** To analyze simple clinical cases and correlates them with microbial causes and resistance patterns.	-Bacterial physiology -Bacterial growth	Interactive lectures	Written exam, short quiz
	2 h practical	**A2:** To differentiate Gram-positive and Gram-negative bacteria. **B2:** To analyze clinical cases and correlates them with microbial causes and resistance patterns.	Types of culture media	Laboratory demonstration	Practical exam
3	3+2	**A1:** To explain basic concepts in microbiology, including classification of	-Genetic and biotechnology	Theoretical lectures.	Paper-based exams

		microorganisms, cellular and genetic structure, and mechanisms of pathogenicity.	-Bacterial nomenclature and classification Sporulation germination	Laboratory demonstration.	
4	3+2	**A1:** To explain basic concepts in microbiology, including classification of microorganisms, cellular and genetic structure, and mechanisms of pathogenicity.	Chemotherapy	Theoretical lectures. Laboratory demonstration.	Paper-based exams
5	3+2	**A1:** To explain basic concepts in microbiology, including classification of microorganisms, cellular and genetic structure, and mechanisms of pathogenicity.	Morphology of Bacte Staining Classification. Norı flora and pathogenicity	Theoretical lectures. Laboratory experiments.	Paper-based exams
6	3+2	**A2:** To differentiate Gram-positive and Gram-negative bacteria. **B2:** To analyze clinical cases and correlates them with microbial causes and resistance patterns.	Staphylococcus species Streptococcus pyogenes Streptococcus pneumoniae	Theoretical lectures. Laboratory demonstration.	Paper-based exams
7	3+2	**A2:** To differentiate Gram-positive and Gram-negative bacteria. **B2:** To analyze clinical cases and correlates them with microbial causes and resistance patterns.	Non spore forming C. diphtheriae Spore-forming bacteria Bacillus species (B. anthracis, B. subtilis, B. cereus). Clostridium species	Theoretical lectures. Laboratory demonstration.	Paper-based exams
8	**Mid-term exam**				
9	3+2	**A2:** To differentiate Gram-positive and Gram-negative bacteria. **B2:** To analyze clinical cases and correlates them with microbial causes and resistance patterns.	Propionibacterium acnes, Listeria	Theoretical lectures. Laboratory demonstration.	Paper-based exams
10	3+2	**A2:** To differentiate Gram-positive and Gram-negative bacteria.	Mycobacterium tuberculosis; M. leprae Actinomycetes	Theoretical lectures.	Paper-based exams

		B2: To analyze clinical cases and correlates them with microbial causes and resistance patterns.	Nocardia Chlamyadiae	Laboratory demonstration.	
11	3+2	**A2:** To differentiate Gram-positive and Gram-negative bacteria. **B2:** To analyze clinical cases and correlates them with microbial causes and resistance patterns.	Identification & classification of Gram negative bacteria Enterobacteriaceae: E. coli; Klebsiella species Citrobacter , Sertalia, Hafmia, Enterobacter	Theoretical lectures. Laboratory demonstration.	Paper-based exams
12	3+2	**A2:** To differentiate Gram-positive and Gram-negative bacteria. **B2:** To analyze clinical cases and correlates them with microbial causes and resistance patterns.	Shigella species; Salmonella species; Proteus species, Pseudomonas species	Theoretical lectures. Laboratory demonstration.	Paper-based exams
13	3+2	**A2:** To differentiate Gram-positive and Gram-negative bacteria. **B2:** To analyze clinical cases and correlates them with microbial causes and resistance patterns.	Vibrio Cholerae; Bruce species ; Haemophilus species ; Campylobacte species .	Theoretical lectures. Laboratory demonstration.	Paper-based exams
14	3+2	**A2:** To differentiate Gram-positive and Gram-negative bacteria. **B2:** To analyze clinical cases and correlates them with microbial causes and resistance patterns.	Helicobacter species ; Bordetella pertussis; Treponema pallidum (Spirochetes);Yersinia pestis; Pasteurella multicidae.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
15	3	**B3:** To apply the concept of self-learning	Students' seminars	Presentation	Presentation

11. Course Evaluation

- 20 M Theoretical assessment;
  (paper-based mid-term exam + quiz + attendance + seminar)
- 20 M practical assessment (attendance + quiz + practice)
- 60 M paper-based theoretical final exam

100 M total

12. Learning and Teaching Resources

Required textbooks	1. Brooks GF, Carroll KC, Butel JS, Morse SA. Jawetz, Melnick, and

	Adelberg's Medical Microbiology, 24th edition, MCGraw-Hill, Last Edition. 2. Brwn AE. Bensonn's Microbiological Application, MCGraw-Hill. Last Edition
Main references (sources)	1. Hugo and Russell's - Pharmaceut Microbiology 8th edition 2. Lippincott illustrated review microbiol . By Harvey. Last Edition
Electronic References, Websites	https://www.who.int/ https://www.cdc.gov/index.htm
Curriculum development	5%

Course Description Form

1. Course Name:

Organic Chemistry II (Theoretical+ Practical)

2. Course Code:

Phpch25_213-

3. Semester / Year:

Second Year / First Semester

4. Description Preparation Date:

1/9/2025

5. Available Attendance Forms:

Students' signature on attendance sheet

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

3 hours Theoretical + 2 hours Practical /3 units

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

Theoretical:

Name:BananBorhanSaeed
Email:bananaldewachi@uomosul.edu.iq
Name: Nagham M. ZakiDawood
Email: n3_m3_zmz@uomosul.edu.iq
Name: EmanMahmoodHasan
Email: emanmahmood87@uomosul.edu.iq

Practical

Asst. Lecturer Istabrak Mohammed Abdullah
Email: istabrick.mohammed@uomosul.edu.iq
Asst. Lecturer Amal Fakhruddin Hamed
Email: amal-aldulaimi@uomosul.edu.iq
Asst. Lecturer Noor Ahmed Mohammed Waheed
Email: noorwaheed@uomosul.edu.iq

8. Course Objectives

Course Objectives	Enable the student to obtain theoretical and practical information in organic chemistry.

9. Teaching and Learning Strategies

Strategy	Lecturing, Homework, Quiz, Practical laboratory

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3 theoretical	**A1** – The student explains the fundamental conce of organic compou	Introduction to aromatic compounds Nomenclature of benzene derivatives	Theoretical lectures.	Paper-based exams

		including the conce of aromaticity, by describing the crite of aromaticity and nomenclature of benzene and its derivatives.			
	2 practical	**A2** – The student understands the fundamental conce for identifying orga compounds using various physical an chemical methods a learns how to perfo laboratory experiments accurately and safe **B1** – The student applies chemical safety procedures a professional condu inside the laborator and handles chemic properly	Introduction	practical laboratory experiments	Theory exam report
2	3 theoretical	**A1-** The student explains the basic concepts of benzen and its derivative reactions. **C1**- The student experiments to prep benzene compound and their derivative using the reactions involved in these compounds.	Reactions and synthesis of benzene derivatives	Theoretical lectures.	Paper-based exams
	2 practical	**B2**- The student distinguishes the solubility of chemi compounds throug the chemical properties of the compound and its nature.	Determination of solubility	practical laboratory experiments	Theory exam report
3	3 theoretical	**A1**- The student explains the basic concepts of arenes their derivatives. **C1**- The student xperiments with the eparation of arenes nd their derivatives using the reactions involved in these .compounds	Arenas and their derivatives (reaction and synthesis)	Theoretical lectures.	Paper-based exams
	2 practical	**C2-** The student analyzes the solubi results to determin	Solubility unknown	practical laboratory experiments	Theory exam report

		the functional grou the unknown organ compound. **E1**- The student estimates the group which the unknown compound belongs based on its solubil characteristics.			
4	3 theoretical	**A1**- The student explains the basic concepts of phenol terms of their chemical and physi properties and methods of nomenclature. **C1-** The student experiments with t preparation of phenolic compoun and their derivative and studies the reactions of these compounds.	Phenols (reaction and synthesis)	Theoretical lectures.	Paper-based exams Class participation
	2 practical	**A3-** The student wi identify some of th chemical structures phenols, as well as some of their physi and chemical properties, and will explain general methods for detecti phenols. **B2-** The student wi differentiate betwe types of phenols us specific methods fo detecting each type	Identification of Phenols	practical laboratory experiments	Theory exam Homework
5	3 theoretical	**A1-** The student explains the basic concepts of amino compounds in term their classification methods of naming along with a comprehensive introduction to thei general structure.	Introduction to amine compound classification and nomenclature o Amines	Theoretical lectures.	Paper-based exams
	2 practical	**A3-** The student lea about some carbox acid compounds an their types, and the physical and chemi properties.	Identification of carboxylic acid (general)	practical laboratory experiments	Theory exam Homework
6	3 theoretical	**A3-** The student identifies some	Reactions of Amines	Theoretical lectures.	Paper-based exams

		reactions of differe types of amines. **B2-** The student distinguishes the b methods for prepar amines that give th highest yield.			
	2 practical	**A3-** The student wi learn about: General methods fo detecting carboxyli acids. **B2-** The student wi distinguish betwee different acids usin the specific tests fo each acid.	Identification of carboxylic acid (special test)	practical laboratory experiments	Theory exam report
7	3 theoretical	**A1-** The student explains some methods for prepar amines. **B2-** The student distinguishes betwe the best methods us to prepare all types amines with the highest yields.	Synthesis of Amines	Theoretical lectures.	Paper-based exams
	2 practical	**E1-** The student estimates the type c compound through chemical testing procedures specific acids.	Unknown for identification of carboxylic acid	practical laboratory experiments	Theory exam
8	Midterm exam				
9	3 theoretical	**A1-** The student explains the basic concepts of aldehy and ketone compounds.	Introduction of aldehydes and ketones	Theoretical lectures.	Paper-based exams
	2 practical	**A3-** The student wi identify some of th chemical properties aldehydes and keto of their various typ **B2-** The student wi distinguish betwee the different metho for differentiating between aldehydes and ketones and identifying their different types.	Identification of aldehydes and ketones	practical laboratory experiments	Theory exam
10	3 theoretical	**A1-** The student explains the basic concepts of naming aldehydes and	Classification, nomenclature of aldehydes and ketones	Theoretical lectures.	Paper-based exams

		ketones. **B2-** The student distinguishes betwe aldehydes and ketones.			
	2 practical	**E1-** The student estimates the type compound through chemical testing procedures on it.	Unknown for identification of aldehydes and ketones	practical laboratory experiments	Theory exam
11	3 theoretical	**A1-** The student explains the basic concepts of the reactions of aldehy ketones, and their derivatives. **C1-** The student experiments to prep aldehydes, ketones and their derivative using their reaction	Reactions and Synthesis of aldehydes and ketones	Theoretical lectures.	Paper-based exams
	2 practical	**A3-** The student identifies some alcohols, their type their physical and chemical properties and methods for detecting alcohols. **B2-** The student distinguishes betwe types of alcohols u the specific tests fo each type.	Identification of Alcohols	practical laboratory experiments	Homework report
12	3 theoretical	**A3-** The student identifies some important propertie carboxylic acids an how they are name **C2-** The student analyzes the effect electron-donating a electron-withdrawi substituent groups the acidity of these compounds.	Introduction, nomenclature properties of Carboxylic acids	Theoretical lectures.	Paper-based exams
	2 practical	**E1-** The student estimates the type compound through specific chemical testing procedures each type of alcoho	Unknown for identification of Alcohols	practical laboratory experiments	Theory exam
13	3 theoretical	**A3-** The student wi learn about some o the methods used t prepare carboxylic acids and some of their reactions.	Synthesis and reaction carboxylic acids	Theoretical lectures.	Paper-based exams

		C3- The student wi use the information given in the lecture choose the best methods for prepar carboxylic acids wi the highest yield.			
	2 practical		Review of practical experienc		
14	3 theoretical	**A3** - The student identifies some carboxylic acids us in medicine. **B2 -** The student distinguishes the ef of the structure of some carboxylic ac on their biological activity.	Some medical applications carboxylic acids.	Interactive lectures (and enrichment via the online classroom)	Paper-based exams
	2 practical		Comprehensive exam	practical laboratory experiments	oretica l exam ractical exam
15	3 theoretical	**A3.** The student wi identify the medica used derivatives of carboxylic acids, th methods of preparation, and th most important reactions. **B2**. The student wi distinguish the effe of the structure of some carboxylic ac derivatives on their biological activity.	Derivatives of Carboxylic Acids	Interactive lectures (and enrichment via the online classroom)	Theory exam

11. Assessment	
20 marks theoretical 20 marks practical 60 marks final exam Total: 100	
12.. Educational Resources	
Required textbooks (curricular books, if any	1. Morrison RT, Boyd RN. Organic Chemistry. 6th edition ,2008
Main references (sources)	1. Textbook of organic chemistry for pharm students KS Mukheriee
Recommended books and references (scientific journals, reports...)	**https://www.abe.pl/en/book/9781642873740/textbook-of-organic-chemistry-for-pharmacy-students**
Electronic References, Websites	%5

Course Description Form

1. Course Name:
Physical pharmacy I (Theoretical+ Practical)
2. Course Code:
Phind25_214-
3. Semester / Year:
First semester/2025-2026
4. Description Preparation Date:
01/9/2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical (75) /4 units
7. Course administrator's name
Theoretical
Dr. Ali Alazzo Email: alialazzo@uomosul.edu.iq
Practical
Dr. Amina Mudhafar Al-Nima Email: amnah.mudhafar@uomosul.edu.iq
8. Course Objectives

Course Objectives	• Learning the physical principles that guide the pharmaceutical dosage form. • Understanding the basis of solubility, kinetics and drug delivery.
9. Teaching and Learning Strategies	
Strategy	Lecturing Seminars Homework Practical laboratory demonstrations and team lab work

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	1. Understand the nature of the intra- and intermolecular forces that are involved in stabilizing molecular and physical structures. 2. Understand the differences in these forces and their relevance to different types of molecules. 3.Appreciate the differences in the strengths of the intermolecular forces that are responsible for the stability of structures in the different states of matter.	States of matter, binding forces between molecules, and The gaseous state	Theoretical lectures. Laboratory experiments	Paper-based exams
2	3+2	1. Understand the properties of the different states of matter. 2. Describe the pharmaceutical relevance of the different states of matter to drug	Liquids, solid and crystalline matters; The liquid crystalline state and The supercritical fluid state	Theoretical lectures. Laboratory experiments	Paper-based exams

		delivery systems by reference to specific examples given in the text boxes. 3. Describe the solid state, crystallinity, solvates, and polymorphism.			
3	3+2	1.Understand phase equilibria and phase transitions between the three main states of matter. 2. Understand the phase rule and its application to different systems containing multiple components.	Thermal analysis , phase equilib phase rule and solid dispersion	Theoretical lectures. Laboratory experiments	Paper-based exams
4	3+2	1.Identify and describe the four colligative properties of nonelectrolytes in solution. 2.Understand the various types of pharmaceutical solutions.	Solutions of non-electrolytes, properties and concentration expressions	Theoretical lectures. Laboratory experiments	Paper-based exams
5	3+2	1.Define ideal and real solutions using Raoult's and Henry's laws. 2.Calculate vapor pressure lowering, boiling point elevation, freezing point lowering, and pressure for solutions of nonelectrolytes.	ideal and real solutions, colliga properties, molecular we determination	Theoretical lectures. Laboratory experiments.	Paper-based exams
6	3+2	1.Understand the important properties of solutions of electrolytes. 2.Calculate the conductance of solutions, the equivalent conductance, and the equivalent conductance of electrolytes. 3.Apply the Arrhenius theory of electrolytic dissociation.	Solution of electrolytes, properties, Theory of dissociation, Theory of strong electrolytes	Theoretical lectures. Laboratory experiments	Paper-based exams
7	3+2	1.Calculate ionic strength. 2.Calculate osmotic coefficients, osmolality, and osmolarity. 3.Understand the differences between osmolality and osmolarity.	Ionic strength, Debye-Huchle theory, coefficients for expressi colligative properties	Theoretical lectures. Laboratory experiments	Paper-based exams
8	3+2	Define saturated solution, solubility, and unsaturated solution. Describe and give examples of polar, nonpolar, and semipolar solvents.	Solubility and distribution phenomena, solvent-solute interactions, solubility of gases liquids,	Theoretical lectures. Laboratory experiments	Paper-base exams
9	3+2	Define complete and partial miscibility.	Solubility of liquids in liquids, solubility of solids in liquids,	Theoretical lectures.	Paper-based exams

		Understand the factors controlling the solubility of weak electrolytes.		Laboratory experiments.	
10	3+2	Define **thermodynamic solubility** and **kinetic solubility**. Define **poor aqueous solubility** in the context of drug development. Describe experimental methods for determining solubility	Determining thermodynamic and kinetic solubility, Poor aqueous solubility, Measuring solubility	Theoretical lectures. Laboratory experiments	Paper-based exams
11	3+2	Describe what a distribution coefficient and partition coefficient are and their importance in pharmaceutical systems.	distribution of solutes between immiscible solvents.	Theoretical lectures. Laboratory experiments	Paper-based exams
12	3+2	1.Describe the Br¨onsted–Lowry and Lewis electronic theories. 2.Understand the concepts of acid–base equilibria and the ionization of weak acids and weak bases.	Ionic equilibria, modern theories acids, bases and salts, acid-base equilibria.	Theoretical lectures. Laboratory experiments	Paper-based exams
13	3+2	1.Calculate dissociation constants Ka and Kb and understand the relationship between Ka and Kb. 2.Understand the concepts of pH, pK, and pOH and the relationship between hydrogen ion concentration and pH.	calculation of pH, acidity constants, the effect of ionic strength and free energy	Theoretical lectures. Laboratory experiments	Paper-based exams
14	3+2	1.Understand the common ion effect. 2.Discuss the factors influencing the pH of buffer solutions.	Buffered and isotonic solutions: Buffer equation; buffer capacity	Theoretical lectures. Laboratory experiments	Paper-based exams
15	3+2	1.Describe the concept of tonicity and its importance in pharmaceutical systems. 2.Calculate solution tonicity and tonicity adjustments.	isotonic solutions	Theoretical lectures. Laboratory experiments	Paper-based exams

11. Course Evaluation

- 20 M Theoretical assessment;
  (paper-based mid-term exam + quiz + attendance + seminar)
- 20 M practical assessment (attendance + quiz + practice)
- 60 M paper-based theoretical final exam

Total 100 M

12. Learning and Teaching Resources

Required textbooks	1- Alfred Martin et al, Physical Pharmacy,6th edition,2010.

	2- Laboratory Manual for Practical Physical pharmacy adopted by the department.
Main references (sources)	1- **Physicochemical Principles of Pharmacy** by Alexan Taylor Florence and David Attwood. 2- **Fast track: Physical Pharmacy** by Alexander Taylor Flore and David Attwood.
Electronic References, Websites	

Course Description Form

1. Course Name:
Physiology I (Theoretical+ Practical)
2. Course Code:
Phpht25-212
3. Semester / Year:
First semester/2025-2026
4. Description Preparation Date:
01/9/2025
5. Available Attendance Forms:
Students' signature on attendance Excel sheets
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical (75) /4 units
7. Course administrator's name
Theoretical
Assist. Prof Dr. Fawaz A. Alassaf Email: Fawaz.Alassaf@uomosul.edu.iq Lecturer Dr. Mohammed Abdulkareem Younes Email: mohammed-78@uomosul.edu.iq Lecturer Ahmed Hikmat Email: ahmed.alhamdany@uomosul.edu.iq Assist. Lecturer Louay Alchalaby Email: loayalchalaby@uomosul.edu.iq
8. Course Objectives

Course Objectives	Enable students to acquire basic knowledge regarding the functions of the normal body, along with the ability to assess these functions and their relationship to normal and pathological conditions. Additionally, this course aids students in understanding the importance of molecular, biochemical, and cellular mechanisms in maintaining the internal environment stability of the body.

9. Teaching and Learning Strategies	
Strategy	• Lectures and Interactive Presentations • Case-Based Learning • Interactive Workshops and Seminars • Self-Directed Learning and Research Projects • Assessment Strategies • Practical laboratory demonstrations of physiological investigations and experiments in different subjects of physiology.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	A1 student to learn part of C.N.S B2 student to differentiate the difference between the role of each parts & its effect on C.N.S.	Physiology of nerves: Nerve cells; excitation and conduction; Properties of mixed nerves; glia;	Theoretical lectures. Laboratory experiments	Paper-based exams

			neurotrophins; Nerve fiber types and functions		
2	3+2	A2 student understand the role of sympathetic & parasympathetic nervous system B1 student specify the cause of difference due to response.	central regulation of visceral function; the autonomic nervous system	Theoretical lectures. Laboratory demonstration.	Paper-based exams
3	3+2	A1 student to learn the stages of response at different parts of body. A2 student to explain thedifference between the response speed at different body parts.	Synaptic transmission: Reflexes; cutaneous, deep and visceral sensations	Theoretical lectures. Laboratory demonstration.	Paper-based exams
4	3+2	A1 student to learn the function of motor system.	Higher function of the nervous system & motor system	Theoretical lectures. Laboratory demonstration.	Paper-based exams
5	3+2	A1 student to learn the role of C.N.S. in doing function as movement & sleep. C1 student able to give advise to patient suffering from sleep disturbance.	Alert behavior, sleep and electrical activity of the brain; control of posture and movement	Theoretical lectures. Laboratory experiments.	Paper-based exams
6	3+2	A1 student to learn the of renal system. A2 student tounderstand The factors affecting filteration & reabsorption.	Introduction; innervations of the renal vessels; renal clearance; renal blood flow; glomerular filtration rate (GFR) reabsorption of Na^+, Cl^- and glucos	Theoretical lectures. Laboratory demonstration.	Paper-based exams
7	3+2	A1 student to learn the balance between filteration & reabsorption. A2 student to explain the factors affecting glomerulotubular balance	Tubuloglomerular feedback and glomerulotubular balance	Theoretical lectures. Laboratory demonstration.	Paper-based exams
8	3+2	A1 student to learn the balance benefits between the acids & base. B1 student specify the indirect factors affecting balance between the acids & base.	Acid base balance	Theoretical lectures. Laboratory demonstration.	Paper-based exams
9	3+2	A1 student to learn the role of kidney in control acidity. B2 student to	Overcome of acidity and alkalinisation	Theoretical lectures.	Paper-based exams

		differentiate the difference between the role of each parts of body in control acidity.		Laboratory demonstration.	
	Mid-term exam				
10	3+2	A1 student to learn part of C.V.S B1 student specify the role of each parts & its effect on C.V.S.	Cardiovascular physiology, excitation of cardiomiocytes, ECG, cardiac rhythem	Theoretical lectures. Laboratory demonstration.	Paper-based exams
11	3+2	A1 student to learn the work of C.V.S.. A2 student to explain The factors affecting C.V.S. function.	cardiovascular regulatory mechanisms: Local regulatory mechanisms; systemic regulation by the nervous system; systemic regulation by hormones;	Theoretical lectures. Laboratory demonstration.	Paper-based exams
12	3+2	A1 student to learn the role of heart in control pulse. B2 student to differentiate the difference of ECG paper & associated disease .	cardiac arrhythmias; electrographic findings in cardiac diseases; mechanical events of the cardiac cycle; cardiac output;	Theoretical lectures. Laboratory demonstration.	Paper-based exams
13	3+2	A1 student to learn part of respiratory system B1 student specify the role of each parts of respiratory system& its effect on lungs.	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 different parts of the lung	Theoretical lectures. Laboratory demonstration.	Paper-based exams
14	3+2	A1 student to learn process of respiration B1 student specify the role of gases in inspiration & expiration..	Dead space and uneven ventilation; Pulmonary circulation: Pressure, volume, and flow. Gas transport between the lungs and tissue;	Theoretical lectures. Laboratory demonstration.	Paper-based exams
15	3+2	A2 student understand the role of nervous system in controle respiratory system B1 student specify the cause of difference responses due to chemical & non-chemical factors.	Regulation of respiration: Neural control of breathing; Respiratory centers; Regulation of respiratory activity:	Theoretical lectures. Laboratory demonstration.	Paper-based exams

			Chemical factors; non chemical factors		

11. Course Evaluation
• 20 M Theoretical assessment; (paper-based mid-term exam + quiz) • 20 M practical assessment (attendance + quiz + + seminars) • 60 M paper-based theoretical final exam Total 100 M

12. Learning and Teaching Resources	
Required textbooks	• Textbook of Medical Physiology by Guyton AC; latest edition
Main references (sources)	• Vander_s Human Physiology; latest edition • Ganong's review of medical physiology; latest edition
Electronic References, Websites	• **PubMed (**https://pubmed.ncbi.nlm.nih.gov/**)** • **Physiology Online (**https://www.physiologyonline.org/**)** • **PhysiologyWeb (**https://www.physiologyweb.com/**)**

Course Description Form

1. Course Name:
Medical Microbiology II
2. Course Code:
Phcls25 227
3. Semester / Year:
2nd semester/2nd year
4. Description Preparation Date:
15/1/2026
5. Available Attendance Forms:
Sheets signed by students
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theory + 2 hours Practical (75)/ 4 unites
7. Course administrator's name (mention all, if more than one name)
Theoretical
Name: Assis. Prof. Dr. Farah Hazem Omer Email: farahomer@uomosul.edu.iq Name: Assis. Prof. Dr Karam Amer Al-Dabbagh Email: karam.aldabbagh@uomosul.edu.iq Name: Assis. Prof. Dr Zahraa Amer Hashim Email: hashimz@uomosul.edu.iq Assist. Prof Maimonah Qasim Yahya Email: pharm.maymona@uomosul.edu.iq Lec. Dr. Esraa Mohammed Adel Shareef Email: Hakam.22@uomosul.edu.iq Lec. Dr. Thekra Siddeq Email : thekra.siddeq@uomosul.edu.iq
Practical
Assist. Prof Maimonah Qasim Yahya Email: pharm.maymona@uomosul.edu.iq Lec. Dr. Esraa Mohammed Adel Shareef Email: Hakam.22@uomosul.edu.iq Lec. Dr. Thekra Siddeq Email : thekra.siddeq@uomosul.edu.iq Assis. Lec. Islam khalid kamal Email: Islam.khalid@uomosul.edu.iq Assis. Lec. Ghaith Rabie Mohammed Email: Ghaith.Rabee@uomosul.edu.iq
8. Course Objectives

Course Objectives	• Give the student the most important information about the • Parasitic diseases mostly in Iraq& their transmission. • Also studying viruses and the most important groups of viruses associated human pathogenicity. • The course also include immune session which give the student information about innate and adaptive immune response and immune disorders and diseases. • This course also enables the students to understand the principles of innate and adaptive immunity and Studying most diseases deal with

	immunity as well as auto-immune diseases, different defense mechanism.

9. Teaching and Learning Strategies

Strategy	**Theoretical parts**: Lecture in classroom +discussion and oral questions+ Discussion and written question through Google classroom. **Practical part**: Explain work principles+ Applying the lab examinations + making weekly reports + written and practical quiz.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	**A1:** The student distinguishes the morphological and physiological characteristics of various types of parasites (protozoa and helminths) and viruses (DNA & RNA viruses), and understands their replication mechanisms and genetic interactions.	Introduction Parasitology and classification	Theory& practical	Written exam a quiz Practical report
2	3+2	**A1:** The student distinguishes the morphological and physiological characteristics of various types of parasites (protozoa and helminths) and viruses (DNA & RNA viruses), and understands their replication mechanisms and genetic interactions. **B1:** The student identifies the diagnostic methods for various parasitic infections (such as amoebae, flagellates, nematodes, and platyhelminths) based on their distinctive characteristics."	Protozoa: Pathogenic Amoeba (*Entamoeba histolytica*)	Theory& practical	Written exam a quiz Practical report
3	3+2	**A1:** The student distinguishes the morphological and physiological characteristics of various	Cont. Commer amoeba and diseases caused free living amoeba.	Theory& practical	Written exam a quiz Practical report

		types of parasites (protozoa and helminths) and viruses (DNA & RNA viruses), and understands their replication mechanisms and genetic interactions. **B1:** The student identifies the diagnostic methods for various parasitic infections (such as amoebae, flagellates, nematodes, and platyhelminths) based on their distinctive characteristics."			
4	3+2	**A1:** The student distinguishes the morphological and physiological characteristics of various types of parasites (protozoa and helminths) and viruses (DNA & RNA viruses), and understands their replication mechanisms and genetic interactions. **B1:** The student identifies the diagnostic methods for various parasitic infections (such as amoebae, flagellates, nematodes, and platyhelminths) based on their distinctive characteristics."	Flagellates of GIT and reproductive system. Ciliates *(Balantidi coli*)	Theory & practica	Written exam a quiz Practical report
5	3+2	**A1:** The student distinguishes the morphological and physiological characteristics of various types of parasites (protozoa and helminths) and viruses (DNA & RNA viruses), and understands their replication mechanisms and genetic interactions. **B1:** The student identifies the diagnostic methods for various parasitic infections (such as amoebae, flagellates, nematodes, and platyhelminths) based on	Flagellates of blood and tissues Leishmania)	Theory & practical	Written exam a quiz Practical report

		their distinctive characteristics."			
6	3+2	**A1:** The student distinguishes the morphological and physiological characteristics of various types of parasites (protozoa and helminths) and viruses (DNA & RNA viruses), and understands their replication mechanisms and genetic interactions. **B1:** The student identifies the diagnostic methods for various parasitic infections (such as amoebae, flagellates, nematodes, and platyhelminths) based on their distinctive characteristics."	Flagellates of blood a tissues (Trypanoson	Theory & practica	Written exam a quiz Practical report
7	3+2	**A1:** The student distinguishes the morphological and physiological characteristics of various types of parasites (protozoa and helminths) and viruses (DNA & RNA viruses), and understands their replication mechanisms and genetic interactions. **B1:** The student identifies the diagnostic methods for various parasitic infections (such as amoebae, flagellates, nematodes, and platyhelminths) based on their distinctive characteristics."	Protozoa: Haemosporidia (Plasmodium spp.)	Theory & practica	Written exam a quiz Practical report
8	3+2	**A1:** The student distinguishes the morphological and physiological characteristics of various types of parasites (protozoa and helminths) and viruses (DNA & RNA viruses), and understands their replication mechanisms and genetic interactions.	*Toxoplasma gondii*) Protozoa: Coccidia	Theory & practica	Written exam a quiz Practical report

		B1: The student identifies the diagnostic methods for various parasitic infections (such as amoebae, flagellates, nematodes, and platyhelminths) based on their distinctive characteristics."			
9	3+2	**A1:** The student distinguishes the morphological and physiological characteristics of various types of parasites (protozoa and helminths) and viruses (DNA & RNA viruses), and understands their replication mechanisms and genetic interactions. **B1:** The student identifies the diagnostic methods for various parasitic infections (such as amoebae, flagellates, nematodes, and platyhelminths) based on their distinctive characteristics."	- Helminthes classification - Cestodes (Taenia sp *Hymenolepis nana*)	Theory & practica	Written exam a quiz Practical report
10	3+2	**A1:** The student distinguishes the morphological and physiological characteristics of various types of parasites (protozoa and helminths) and viruses (DNA & RNA viruses), and understands their replication mechanisms and genetic interactions. **B1:** The student identifies the diagnostic methods for various parasitic infections (such as amoebae, flagellates, nematodes, and platyhelminths) based on their distinctive characteristics."	Cont. Echinococ spp.	Theory & practica	Written exam a quiz Practical report
11	3+2	**A1:** The student distinguishes the morphological and physiological	Trematodes: Schistosoma spp.	Theory & practica	Written exam a quiz Practical report

		characteristics of various types of parasites (protozoa and helminths) and viruses (DNA & RNA viruses), and understands their replication mechanisms and genetic interactions. **B1:** The student identifies the diagnostic methods for various parasitic infections (such as amoebae, flagellates, nematodes, and platyhelminths) based on their distinctive characteristics."			
12	3+2	**A1:** The student distinguishes the morphological and physiological characteristics of various types of parasites (protozoa and helminths) and viruses (DNA & RNA viruses), and understands their replication mechanisms and genetic interactions. **B1:** The student identifies the diagnostic methods for various parasitic infections (such as amoebae, flagellates, nematodes, and platyhelminths) based on their distinctive characteristics."	Nematodes (Asca Hookworms)	Theory & practica	Written exam a quiz Practical report
13	3+2	**A1:** The student distinguishes the morphological and physiological characteristics of various types of parasites (protozoa and helminths) and viruses (DNA & RNA viruses), and understands their replication mechanisms and genetic interactions. **B1:** The student identifies the diagnostic methods for various parasitic infections (such as amoebae, flagellates, nematodes, and platyhelminths) based on	Cont. Enterob Trichuris	Theory & practica	Written exam a quiz Practical report

		their distinctive characteristics."			
1	3	**A1:** The student distinguis the morphological physiological characteristics various types of paras (protozoa and helminths) viruses (DNA & RNA virus and understands their replicat mechanisms and gen interactions.	Introduction Virology and gen characters	Theory	Written exam quiz
2	3	**A1:** The student distinguis the morphological physiological characteristics various types of paras (protozoa and helminths) viruses (DNA & RNA virus and understands their replicat mechanisms and gen interactions.	Reproduction isolation methods viruses	Theory	Written exam quiz
3	3	**B2:** The student sugg appropriate therape strategies (such as anti-v therapies) based on understanding of gen interaction and the structu characteristics of the microbe	Anti-viral therapy gene interaction	Theory	Written exam quiz
4	3	**A1:** The student distinguis the morphological physiological characteristics various types of paras (protozoa and helminths) viruses (DNA & RNA virus and understands their replicat mechanisms and gen interactions.	Classification of viru	Theory	Written exam quiz
5	3	**A1:** The student distinguishes the morphological and physiological characteristics of various types of parasites (protozoa and helminths) and viruses (DNA & RNA viruses), and understands their replication mechanisms and genetic interactions.	DNA viruses: HERPESVIRIDA (HSV1&2, Varic Zoster HV4,5,6,7,8), POXVIRIDAE(hu an pox disea ADENOVIRIDA deno disea PAPOVIRIDAE(V and its differ types),	Theory	Written exam quiz

			HEPADNAVIRIDE (HBV, PARVOVIRIDAE B19)		
6	3	**A1:** The student distinguishes the morphological and physiological characteristics of various types of parasites (protozoa and helminths) and viruses (DNA & RNA viruses), and understands their replication mechanisms and genetic interactions.	RNA viruses: Enveloped Segmented Single-Stranded RNA Viruses (Influenza A,B,C), Enveloped Nonsegmented ssRNA Viruses (parainfluenza, mumps virus, measles virus, RSV), Rhabdovirus family; genus Lyssavirus (Rabies), Flavivirus, ssRNA +ve sense (HCV), HIV, Nonenveloped Nonsegmented ssRNA Viruses: Picornaviruses and Caliciviruses (Picornaviruses HAV), Nonenveloped Segmented dsRNA Viruses: Reoviruses (rota & reo), Prions and Spongiform Encephalopathies	Theory	Written exam a quiz
1	3	**A2:** The student explains the mechanisms of innate and adaptive immunity, understands the role of cytokines and complements, and analyzes the body's	Innate immune response: • Describe the characteristics of innate immunity,	Theory	Written exam a quiz

		response to pathogens and hypersensitivity cases."	Describe physical and chemical immune barriers, *explain immediate and induced innate immune responses, *discuss natural killer cells, *describe major histocompatibility class I, II molecules, *how the proteins i complement system function to dest extracellular pathogens		
2	3	**A2:** The student explains mechanisms of innate a adaptive immunity, understa the role of cytokines a complements, and analyzes body's response to pathog and hypersensitivity cases."	Cytokines: Properties of cytokines Biological functions of cytokines Cytokines family	Theory	Written exam a quiz
3	3	**A2:** The student explains the mechanisms of innate and adaptive immunity, understands the role of cytokines and complements, and analyzes the body's response to pathogens and hypersensitivity cases."	Adaptive immune response: •Describe the characteristics of adaptive immunity, •explain cell functions (basics of B and T cells), •describe the formation of B and T cells, •discuss humoral immunity (How B cells function), •explain cell mediated immunity (T	Theory	Written exam a quiz

			cell types and functioning), •Summarize how the cells work together for an adaptive immune response		
4	3	**A2:** The student explains mechanisms of innate a adaptive immunity, understa the role of cytokines a complements, and analyzes body's response to pathog and hypersensitivity cases."	Antibodies characteristics features: *Distinguish between the overall structure and the fine structure of antibodies * Describe the variable and constant regions of an antibody's light and heavy chains. *Name and compare the biological and chemical characteristics of the five classes of antibodies. *Contrast conventional antib and monoclo antibody development; conceptualize procedure monoclonal antib screening; and disc hybrid monoclo antibodies.	Theory	Written exam a quiz
5	3	**A2:** The student explains the mechanisms of innate and adaptive immunity, understa the role of cytokines and complements, and analyzes t body's response to pathogens and hypersensitivity cases."	Hypersensitivity reactions: *classification of hypersensitivity types with respect to the participating	Theory	Written exam a quiz

			immune effectors and mechanisms of tissue damage. *Understand how normal T cell and B cell antigen recognition, signaling, and effector functions contribute to hypersensitivity. *Recognize the common clinical manifestants of the 4 types of hypersensitivity.		
6	3	**A2:** The student explains mechanisms of innate a adaptive immunity, understa the role of cytokines a complements, and analyzes body's response to pathog and hypersensitivity cases."	Tumor immunology: *understand how the immune system mounts an immune response against tumors *understand how tumors evade immunity *review strategies combat tumors ba on immunothera including passive a active immunizatio	Theory	Written exam a quiz
7	3	**A2:** The student explains the mechanisms of innate and adaptive immunity, understands the role of cytokines and complements, and analyzes the body's response to pathogens and hypersensitivity cases."	Autoimmune Diseases : *Understand h different autoimm diseases are driven the recognition different autoantig and have differ effector mechanis that result in injury.	Theory	Written exam a quiz

11. Course Evaluation

- 20 M mid-term (2% Class activity + 18% theoretical exam)
- 20 M Quest practical: (5% weekly reports+ 2% class activities + 12% Practical exams)
- 60 M Final paper-based exam

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- 100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1. Animal agents & vectors of human disease 5th edition by Beaver& Jung 2. Medical Microbiology 24th ed. (2007) by Jawetz 3. Atlas of helminthes& Protozoa, 4. Principle of immunology by kuby ed. 2007
Main references (sources)	Lippincott illustrated review microbiology 2nd ed. By Harvey
Recommended books and references (scientific journals, reports...)	Lancet, International Journal of Medi microbiology
Web sites	https://asm.org. American Society of Microbiology.
Course update	2%

Course Description Form

1. Course Name:
Organic Chemistry III
2. Course Code:
Phpch25_229-
3. Semester / Year:
Second Semester \ Second Class
4. Description Preparation Date:
15/1/2026
5. Available Attendance Forms:
Second class list
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours\ 3 units
7. Course administrator's name (mention all, if more than one name)

Theoretical:

Assistant Professor Dr. Nagham Mohamed Zaki Dawood
Email: n3_m3_zmz@uomosul.edu.iq

Assistant Professor Dr. Banan Borhan Saeed
Email:bananaldewachi@uomosul.edu.iq

Dr. Eman Mahmood Hasan
Email: emanmahmood87@uomosul.edu.iq

Practical:

Noor Ahmed Mohammed Waheed
Email: noorwaheed@uomosul.edu.iq

Fatima Murhaf
Email: fatima.murhaf@uomosul.edu.iq

Shaimaa Khalaf
Email: sh_kh2090@uomosul.edu.iq

8. Course Objectives	
Course Objectives	Identifying the various heterocyclic organic compounds, their properties, metho naming them, their reactions, some methods of preparation, in addition to a overview of their biological activity.

9. Teaching and Learning Strategies	
Strategy	• Interactive lectures (and supplementary resources via the online classroom) • Practical laboratory experiments (enhancing applied skills) • Classroom discussions and case studies (stimulating critical thinking and connecting concepts) • Student presentations (promoting self-directed learning) • Homework assignments and research activities (promoting self-directed learning)

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical	A1- Explains to the student an introductio heterocyclic compour in general, including their properties and importance. C2- Display to the student how heterocy compounds are classified.	Introduction to heterocyclic compounds and their classification.	Interactive and enriching lectures vi the online classroon	Examinatio
	2 Practical	B1- The student appli methods for detecting functional groups. C1- The student adhe to safety procedures a professional conduct within the laboratory when handling chemicals.	Introduction to chemical identification method	practical laboratory experiments	Practical ex and report
2	2 Theoretical	A1- Explains to the student the natural sources of heterocycli compounds. C3- The student pract the systematic naming these compounds afte being shown the diffe naming methods used the various systems adopted by the source	Occurrence in nature and in medicinal products nomenclature of Heterocyclic Compounds	Interactive and enriching lectures vi the online classroon Classroom discussio and case analysis	Examinatio
	2 Practical	A2- The student distinguishes between the different types of salts of carboxylic aci B2- The student analy the methods for detec and distinguishing between different salt	Carboxylic acid salts identification : anionic par identification	practical laboratory experiments	Practical ex and report
3	2 Theoretical	C3- The student pract naming these compou systematically after being shown the diffe naming methods used according to the vario systems approved by sources.	Nomenclature of Fused Systems	Interactive and enriching lectures vi the online classroon	Examinatio

	2 Practical	A2- The student distinguishes between the negative and positive ions of the carboxylic acid salt.	Carboxylic acid salts identification : cationic identification	practical laboratory experiments	Practical ex and report
4	2 Theoretical	C3- The student pract naming these compou systematically after being shown the diffe naming methods according to the vario systems approved by sources.	Nomenclature of fused heterocyclic compounds	Interactive and enriching lectures vi the online classroon	Examinatio
	2 Practical	A2- The student distinguishes between the different types of salts. C3- The student pract methods for detecting different types of salts	Unknown: Carboxylic acid salts identification	practical laboratory experiments	Practical ex and report
5	2 Theoretical	A1- Explains to the student the properties reactions, and metho of preparing pyrrole, furan, and thiophene. C1- Lists to the stude some pharmaceutical compounds containin pyrrole, furan, and thiophene.	Five-membered heterocyclic compounds contain one heteroatoms (pyrrole, furan and thiophene).	Interactive and enriching lectures vi the online classroon	Examinatio and Homew
	2 Practical	A2- The student distinguishes between the different types of amines. C3- The student experiments with methods for detecting different types of ami	Classification and Chemical identifications amines	practical laboratory experiments	Practical ex and report
6	2 Theoretical	A1- Explain to the student the nature of aromatic electrophile substitution reactions these compounds, the active sites, and wher these reactions are directed. A2- The student identifies some satura cyclic compounds containing one heteroatomide, their	-Electrophilic substitution in pyrrole, furan, and thiophene. (Reactivity and orientation). -Saturated five-membered heterocyclic	Interactive and enriching lectures vi the online classroon	Examinatio

		methods of preparatio and their benefits.			
	2 Practical	C3- The student experiments with methods for detecting different types of ami	Unknown: Classification and Chem identifications of amines	practical laboratory experiments	Practical ex and report
7	2 Theoretical	A1- Explains some properties of epoxides the student. A2- Demonstrates son reactions of epoxides the student.	Properties and reactions of three member ring (epoxide)	Interactive and enriching lectures vi the online classroon	Examinatio
	2 Practical	A2- The student identifies the types of halides. B1- The student appli the following method for detecting alkyl an aryl halides.	identifications of Alkyl and aryl halides	practical laboratory experiments	Practical ex and report
8	Midterm exam				
9	2 Theoretical	A1- Explains the basi concepts of epoxide preparation to the student. 1C- Lists some pharmaceutical compounds containin the compounds mentioned above.	Preparation of three member rings (epoxides) an some examples	Interactive and enriching lectures vi the online classroon	Examinatio
	2 Practical	B1- The student appli the methods for detec alkyl and aryl halides	Unknown: identifications of Alkyl and aryl halides	practical laboratory experiments	Practical ex and report
10	2 Theoretical	A1- The student prov an introduction to pyridine and its compounds, including their properties and biological importance	Introduction of Six-membered ring compounds pyridine, Source of pyridine compounds, properties	Interactive and enriching lectures vi the online classroon	Examinatio
	2 Practical	B1- The student appli chemical reactions to synthesize a new substance. A2- The student learn the specific mathemat methods for calculatir the expected quantity a substance.	Synthesis of Benzimidazole	practical laboratory experiments	Practical ex and report

		C2- The student appreciates the importance of chemic reactions in synthesiz new substances and th significance in the pharmaceutical indust			
11	2 Theoretical	A1- The student expla the basic concepts and fundamental methods used in preparing pyridine and its derivatives.	Methods of Preparation of pyridine and their derivatives	Interactive and enriching lectures vi the online classroom	Examinatio
	2 Practical	B1- The student appli chemical reactions to synthesize a new substance. A2- The student learn the specific mathemat methods for calculatir the expected quantity a substance.	Unknown: Synthesis of Benzimidazole	practical laboratory experiments	Practical ex and report
12	2 Theoretical	A2- The student expla the reactions that pyridine and its derivatives undergo, s as electrophilic and nucleophilic substitut reactions, and oxidati reduction reactions.	Reactions of pyridine, electrophilic and nucleophilic substitution in pyridine	Interactive and enriching lectures vi the online classroom	Examinatio
	2 Practical	B1- The student appli chemical reactions to synthesize a new substance. A2- The student learn the specific mathemat methods for calculatir the expected quantity a substance. C2- The student appreciates the importance of chemic reactions in the synth of new substances and their significance in th pharmaceutical indust	Synthesis of thiopyrimidine	practical laboratory experiments	Practical ex and report
13	2 Theoretical	A2- The student prov an introduction to ind and its compounds, including their proper	Fused Ring Heterocyclic Compounds Indole	Interactive and enriching lectures vi the online classroom	Examinatio

		and biological importance. B2- The student understands the meth of preparing indole ar its reactions.			
	2 Practical	B1- The student appli chemical reactions to synthesize a new substance. A2- The student learn the specific mathemat methods for calculatir the expected quantity a substance.	Unknown: Synthesis of thiopyrimidine	practical laboratory experiments	Practical ex and report
14	2 Theoretical	A2- The student distinguishes quinolir from other heterocycl compounds and studi its physical and chem properties. B2- The student understands the pharmaceutical compounds that conta quinoline.	Fused ring heterocycles Quinoline	Interactive and enriching lectures v the online classroon	Examinatio
	2 Practical		Review		
15	2 Theoretical	A2- The student distinguishes betwee quinoline and isoquinoline among heterocyclic bicyclic compounds and studi their physical and chemical properties. B2- The student understands the pharmaceutical compounds that conta isoquinoline and the methods for preparing these compounds.	Fused ring heterocycles isoquinoline (benzopyridines)	Student presentatior	Presentatior evaluation

11. Assessment

• 20 marks for theoretical assessment

(Midterm written exam + short class quiz + attendance + seminar)

• 20 marks for practical assessment (attendance + practical exam + report)

• 60 marks for the final written theoretical exam • Total 100 marks	
12. Educational Resources	
Required textbooks (curricular books, if any)	Morrison RT, Boyd RN.Organic Chemistry. 6th edition ,2008
Main references (sources)	Textbook of organic chemistry for pharmacy students KS Mukheriee
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	**https://chemistry.com.pk/books/organic-chemistry-rt-morrison**
Curriculum update rate	5%

Course Description Form

1. Course Name:
Pharmacognosy I (Theoretical+ Practical)
2. Course Code:
Phcog25_2210
3. Semester / Year:
Second semester/2025-2026
4. Description Preparation Date:
01/10/2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical (75) /4 units
7. Course administrator's name
Theoretical
Name: Assist. Prof Dr. Mohanned Emad Qazzaz Email: mohannad.qazzaz@uomosul.edu.iq Dr. Sameer M Mahmood Email: sm.mahmood@uomosul.edu.iq Dr. Ban Ali Ahmed Email: ban-alnuaimy67@uomosul.edu.iq
Practical
Assist. Lecturer: Zena Sideeq Email: zena.sideeq@uomosul.edu.iq Assist. Lecturer: Samara sameer Email: samara.sameer@uomosul.edu.iq Assist. Lecturer: Sura Maan Salim Email: sura.maan@uomosul.edu.iq Assist. Lecturer: Noor Saad Email: noormahmoodph88@gmail.com
8. Course Objectives

Course Objectives To introduce students to the fundamer concepts and principles of pharmacogno focusing on the study of natural produ derived from plants, animals, microorganisms.	• To familiarize students with the identification, collecti preparation, and evaluation of crude drugs and her medicines. • To provide students with an understanding of chemical constituents, pharmacological properties, therapeutic uses of medicinal plants and natural produ • To develop practical skills in the extraction, isolati purification, and analysis of bioactive compounds fr natural sources.

9. Teaching and Learning Strategies	
Strategy	Lecturing Homework Quiz Practical laboratory demonstrations and experiments

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	A2: Understand the scope of Pharmacognosy and analyse its role in drug development. B1: Apply microscopic measurement and magnification tools in the laboratory. C1: Collaborate ethically in discussing scientific concepts related to crude drug examination.	The Scope of Pharmacognosy Micro measurement and magnification	Theoretical lectures. Laboratory experiments	Paper-based exams
2	3+2	A2: Distinguish the physical and cellular characteristics of crude drugs under the microscope. A7: Evaluate potential contaminants or toxic elements in natural samples. B1: Perform slide preparation and microscopic examination accurately.	Drugs from natural sources, crud drugs, official and non-official drugs Microscopical identification of crude drugs and cell contents.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
3	3+2	A2: Classify natural compounds according to their chemical structure. A7: Analyse the pharmacological and toxicological properties of flavonoids. B2: Conduct self-directed research on the medicinal uses of Ruta graveolens. C1: Present scientific findings in a responsible and ethical manner.	Classification of natural products. Microscopical identification of crude drugs and cell contents Flavonoids of Ruta graveolens.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
4	3+2	A2: Understand botanical nomenclature and analyse its relevance to drug identity. B1: Apply extraction and separation techniques in the laboratory. B4: Evaluate the purity of extracted materials for medicinal suitability.	Plant nomenclature and taxonomy. Extraction and separation techniques.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
5	3+2	A2: Analyse the impact of cultivation and drying conditions on active constituents. A7: Predict risks of deterioration or contamination due to improper storage. B3: Provide guidance on proper handling and storage of herbal preparation	Production of crude drugs Cultivation, collection, drying and storage Extraction and separation techniques.	Theoretical lectures. Laboratory experiments.	Paper-based exams

6	3+2	A7: Identify signs of deterioration in crude natural products. B1: Perform chromatographic isolation of citric acid. B4: Assess the quality and safety of isolated materials. C1: Maintain accuracy and integrity in documenting laboratory procedures.	Deterioration of crude natural products Chromatography Isolation of citric acid from lemon juice.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
7	3+2	A7: Evaluate pharmacological actions of natural compounds on biological systems. A2: Analyse correlations between chemical structure and biological activity. B3: Recommend the most suitable compound for a given therapeutic case.	Pharmacological activities of natural products Chromatography.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
8	**Mid-term exam**				
9	3+2	A2: Understand the chemical composition of natural drug products and analyse their physical properties. B1: Apply paper chromatography for separation of active constituents. B4: Assess the purity of chromatographic outcomes for medicinal application.	Chemistry of natural drug products Paper chromatography	Theoretical lectures. Laboratory demonstration.	Paper-based exams
10	3+2	A2: Analyse quality control parameters of herbal products based on physical and chemical standards. A7: Evaluate potential impurities that may cause toxicity or drug interactions. B1: Perform paper chromatography as a verification tool for purity. C1: Document results following ethical scientific reporting standards.	Quality control Paper chromatography	Theoretical lectures. Laboratory demonstration.	Paper-based exams
11	3+2	A2: Understand principles of phytochemical screening for active constituents. B1: Apply thin-layer chromatography in compound detection. B2: Interpret chromatographic patterns through self-guided analysis.	Phytochemical investigation of herbal products Introduction to thin-layer chromatography	Theoretical lectures. Laboratory demonstration.	Paper-based exams
12	3+2	A2: Analyse separation mechanisms using microscopic TLC. B1: Design and conduct TLC experiments on glass slides. C1: Engage in collaborative evaluation of experimental results.	Separation technique TLC on microscope slides.	Theoretical lectures. Laboratory demonstration.	Paper-based exams

13	3+2	A7: Evaluate safety and efficacy of traditional herbal medicines compared to modern therapies. A2: Understand the principles of partition chromatography for volatile oil separation. B3: Advise patients on evidence-based and safe use of traditional remedies.	Traditional plant medicines as a source of new drugs. Partition chromatography for the separation of volatile oils	Theoretical lectures. Laboratory demonstration.	Paper-based exams
14	3+2	A2: Understand tissue culture principles and their role in producing active compounds. A7: Analyse the effect of adsorbents on Rf values and relate them to product quality. B2: Investigate alternative methods for laboratory-scale production of natural products. C1: Present research outputs ethically and systematically.	Tissue culture of medicinal plant Effect of activity of adsorbents on values	Theoretical lectures. Laboratory demonstration.	Paper-based exams

11. Course Evaluation

- 20 M Theoretical assessments;
  (Paper-based mid-term exam + quiz + attendance)
- 20 M practical assessment (attendance + quiz + practice)
- 60 M paper-based theoretical final exam

Total 100 M

12. Learning and Teaching Resources

Required textbooks	• **Trease, and Evans,W.C., Pharmacognosy,16th edition,2009,Elsevier Health Sciences.**
Main references (sources)	

Course Description Form

1. Course Name:
Physical pharmacy II (Theoretical+ Practical)
2. Course Code:
Phind25_2210-
3. Semester / Year:
Second semester/2025-2026
4. Description Preparation Date:
15/1/2026
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical (75) /4 units
7. Course administrator's name
Theoretical
Dr. Ali Alazzo Email: alialazzo@uomosul.edu.iq
Practical
Dr. Amina Mudhafar Al-Nima Email: amnah.mudhafar@uomosul.edu.iq
8. Course Objectives

Course Objectives	• Learning the physical principles that guide the pharmaceutical dosage form. • Understanding the basis of solubility, kinetics and drug delivery.
9. Teaching and Learning Strategies	
Strategy	Lecturing Seminars Homework Practical laboratory demonstrations and team lab work

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	Define **complexation** and explain its importance in pharmaceutical systems. Classify complexes based on their structure and bonding Describe analytical methods used to study complex formation	Complexation Classification of complexes, Metal complexes Organic molecular complexes Inclusion compounds, Methods of analysis	Theoretical lectures. Laboratory experiments	Paper-based exams
2	3+2	Define **diffusion** and explain its significance in pharmaceutical systems. State and explain Fick's first law mathematically Explain Fick's second law in relation to non–steady-state diffusion	Diffusion Introduction , Steady state diffusion , Fick's first law of diffusion, Fick's second law	Theoretical lectures. Laboratory experiments	Paper-based exams

3	3+2	Describe the mechanism of drug diffusion across biological and synthetic membranes. Relate permeability to diffusion coefficient and membrane properties. Explain the setup and working principles of diffusion apparatus.	Diffusion through membranes, Permeability, Diffusion driving forces, Lag time, Apparatus and methods for assessing drug diffusion	Theoretical lectures. Laboratory experiments	Paper-based exams
4	3+2	Define reaction rate, reaction order, and molecularity. Understand and apply apparent zero-order kinetics to the practice of pharmacy. Calculate half-life and shelf life of pharmaceutical products and drugs.	Chemical kinetics stability, rate and order reactions,	Theoretical lectures. Laboratory experiments	Paper-based exams
5	3+2	Describe the influence of temperature, ionic strength, solvent, pH, and dielectric constant on reaction rates.	Influence of tempera and other factors reactions rate	Theoretical lectures. Laboratory experiments	Paper-based exams
6	3+2	Calculate the increase in rate constant as a function of temperature. Describe the factors that influence solid-state chemical kinetics.	Decomposition medicinal agents accelerated stabi analysis.	Theoretical lectures. Laboratory experiments.	Paper-based exams
7	3+2	Differentiate among different types of interfaces and describe relevant examples in the pharmaceutical sciences. Understand the terms surface tension and interfacial tension and their application in pharmaceutical sciences. Calculate surface and interface tensions, surface free energy, its changes, work of cohesion and adhesion, and spreading coefficient for different types of interfaces.	Interfacial phenomena Classification of interfaces, Liquid interfaces, Surface and interfacial tensions, Surface free energy , Measurement of interfacial tension, Spreading coefficient	Theoretical lectures. Laboratory experiments	Paper-based exams
8	3+2	Understand the mechanisms of adsorption on liquid and solid interfaces. Classify surface-active agents and appreciate their applications in pharmacy.	Adsorption at liquid interfaces, surface-activ agents, Systems of HLE Classification , Adsorpt at solid interfaces, The solid gas interface, The solid liquid interface, Wetting and wetting agents	Theoretical lectures. Laboratory experiments	Paper-based exams

9		Understand the Electric properties of interfaces and application in pharmaceutical sciences.	Electric properties of interfaces	Theoretical lectures. Laboratory experiments	Paper-base exams
10	3+2	Differentiate between different types of colloidal systems and their main characteristics.	Colloids, dispersed syst and its pharmaceutical application, types of colloidal systems	Theoretical lectures. Laboratory experiments.	Paper-based exams
11	3+2	Define rheology, provide examples of fluid pharmaceutical products exhibiting various rheologic behaviors, and describe the application of rheology in the pharmaceutical sciences and practice of pharmacy. Differentiate flow properties and corresponding rheograms between Newtonian and non-Newtonian materials.	Rheology, Newtonian and non-newtonian systems,		
12	3+2	Define **thixotropy** as a time-dependent shear-thinning behavior Explain the structural breakdown and recovery process under shear..	Thixotropy, and determination of thixotropy.	Theoretical lectures. Laboratory experiments	Paper-based exams
13	3+2	Define **micrometrics** and explain its importance in pharmaceutical sciences. Describe particle size distribution and its significance. Describe and compare common techniques for determining particle size	Micrometrics Particle size and size distribution Methods of determining particle size Particle shape and surface area	Theoretical lectures. Laboratory experiments	Paper-based exams
14	3+2	Students should be able to explain and evaluate the following: Porosity and Packing Arrangements, Densities of Particles, Bulkiness, Flow Properties	Methods for determining surface area, Derived properties of powders (porosity, packing arrangements, densities of particles, bulkiness and flow properties)	Theoretical lectures. Laboratory experiments	Paper-based exams
15	3+2	Define **polymers** and explain their importance in pharmaceutical applications. Define **copolymers** and distinguish between their types Define and differentiate between: • Thermoplastic polymers	Pharmaceutical polymers Introduction (history, general concepts, synthesis) Copolymers and polymer blends	Theoretical lectures. Laboratory experiments	Paper-based exams

		• Thermosetting polymers	Thermoplastic and thermoset polymers		

11. Course Evaluation

- 20 M Theoretical assessment;
  (paper-based mid-term exam + quiz + attendance + seminar)
- 20 M practical assessment (attendance + quiz + practice)
- 60 M paper-based theoretical final exam

Total 100 M

12. Learning and Teaching Resources

Required textbooks	1- Alfred Martin et al, Physical Pharmacy,6th edition,2010. 2- Laboratory Manual for Practical Physical pharmacy adopted by the department.
Main references (sources)	1- **Physicochemical Principles of Pharmacy** by Alexander Ta Florence and David Attwood. 2- **Fast track: Physical Pharmacy** by Alexander Taylor Florence David Attwood.

Course Description Form

1. Course Name:
Physiology II (Theoretical+ Practical)
2. Course Code:
Phpht25 2212
3. Semester / Year:
Second semester/2025-2026
4. Description Preparation Date:
01/9/2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical (75) /4 units
7. Course administrator's name
Theoretical
Assist. Prof Dr. Abdulla Aqeel Altayyar Email: abdulla.a.ahmad@uomosul.edu.iq Lecturer Dr. Mohammed Abdulkareem Younes Email: mohammed-78@uomosul.edu.iq Lecturer Ahmed Hikmat Email: ahmed.alhamdany@uomosul.edu.iq Assist. Lecturer Louay Alchalaby Email: loayalchalaby@uomosul.edu.iq
8. Course Objectives

Course Objectives The course identifies the basic knowle about the physiology of Circulatory body flu Endocrinology and Gastrointestinal system.	This course enables the students to understand principles of physiology including blood, lym immunity, different glands (hypothalamus, pituita thyroid, parathyroid, adrenal, pancreas) gastrointestinal system.

9. Teaching and Learning Strategies

Strategy	Lecturing Seminars Quiz Practical laboratory demonstrations of physiological investigations and experiments in different subjects of physiology.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	Circulatory body fluid: Introduction; blood; bone marrow	A1 student to learn the body fluids. A2 student to understand role of bone marrow & its effects on body fluids.	Theoretical lectures. Laboratory experiments	Paper-based exams
2	3+2	White blood cells; immunity; Platelets; red blood cells;	A2 student understand the role Of blood cells. B1 student specify the cause of difference in immunity to disease.	Theoretical lectures. Laboratory demonstration.	Paper-based exams

3	3+2	Anemia; polycythemia Blood group and Rh factor; hemostasis:	A1 student to learn the types of anemia. A2 student to explain thedifference between different blood groups.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
4	3+2	The clotting mechanism / blood coagulation tests Anti-clotting mechanism; the plasma	A1 student to learn the process blood clotting.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
5	3+2	The lymph; abnormalities of hemostasis	A1 student to learn the the role of ltmphatic system. C1 student able to give advise patient suffering from bleeding abnormalities.	Theoretical lectures. Laboratory experiments.	Paper-based exams
6	3+2	Digestion and absorption of carbohydrates; proteins; lipids; absorption of water and electrolytes; vitamins and minerals	A1 student to learn the the of digestive system. A2 student tounderstand The factors affecting the absorption of water and electrolytes; vitamins and minerals.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
7	3+2	regulation of gastrointestinal function: Introduction; gastrointestinal hormones; mouth and esophagus; stomach	A1 student to learn the factors affectind digestive system functions. A2 student to explain the functions of mouth, Esophagus & stomach.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
8		exocrine portion of the pancreas; liver and biliary system; small intestine; colon	A1 student to learn the benefit of liver and biliary system; small intestine; colon B1 student specify the exocrine function of the pancreas & its effect on digestion .	Theoretical lectures. Laboratory demonstration.	Paper-based exams
	Mid-term exam				
9	3+2	Introduction; energy balance, metabolism and nutrition.	A1 student to learn the role of metabolism and nutrition.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
10	3+2	the pituitary gland	A1 student to learn the parts Of the pituitary gland .	Theoretical lectures.	Paper-based exams

			B1 student specify the role of each parts & its effects on maintaing the internal enviroments.	Laboratory demonstration.	
11	3+2	the thyroid gland	A1 student to learn the Functions of the thyroid gland. A2 student to explain the factors affecting functions of t thyroid gland.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
12		Parathyroid gland;calcium metabolism	A1 student to learn the parts Of the parathyroid gland . B1 student specify the role Of Parathyroid gland in regulation of calcium metabolism.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
13	3+2	the gonads: development and function of the male reproductive system	A1 student to learn the parts Of gonads . B1 student specify the role Of each parts & its role on function of the male reproductive system .	Theoretical lectures. Laboratory demonstration.	Paper-based exams
14	3+2	the gonads: development and function of the female reproductive system	A1 student to learn the parts Of gonads . B1 student specify the role Of each parts & its role on function of the female reproductive system .	Theoretical lectures. Laboratory demonstration.	Paper-based exams
15	3+2	endocrine functions of the pancreas and regulation of carbohydrate metabolism	A2 student understand the Role pancreas in endocrine functions. B1 student specify role Of Pancreas in regulation of carbohydrate metabolism.	Theoretical lectures. Laboratory demonstration.	Paper-based exams

11. Course Evaluation

- 20 M Theoretical assessment;
  (paper-based mid-term exam + quiz)
- 20 M practical assessment (attendance + quiz + + seminars)
- 60 M paper-based theoretical final exam

  _____
  Total 100 M

12. Learning and Teaching Resources

Required textbooks	Textbook of Medical Physiology by Guyton AC; latest edition
Main references (sources)	• Vander_s Human Physiology; latest editi • Ganong's review of medical physiolo latest edition

Course Description Form

1. Course Name:

Biochemistry I (theoretical and practical)

2. Course Code:

Phcls25_311

3. Semester / Year:

First semester / 2025-2026

4. Description Preparation Date:

01/09/2025

5. Available Attendance Forms:

Students' signature on attendance sheet

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

3 hours Theoretical + 2 hours Practical (75) /4 units

7. Course administrator's name

Theoretical

Name: Assist. Prof. Dr. Jehan Abdulwahab Mohammad
Email: dr.jehan.biochem@uomosul.edu.iq
Name: Lecturer Dr. Zaid Muwafaq Younus
Email: z.m.younus@uomosul.edu.iq
Name: Lecturer Dr. Sameer Mohammed Mahmood
Email: sm.mahmood@uomosul.edu.iq
Name: Lecturer. Mayada Husam
Email: Mayadaaljammas@uomosul.edu.iq
Name: Lecturer Dr. Hiba Radhwan Tawfeeq
Email: hiba.radhwan@uomosul.edu.iq

Practical

Name: lecturer. Marwa Husam Almawla
Email: marwaalmola@uomosul.edu.iq
Name: Lecturer Fatimah Haitham Fathi
Email: fatma17@uomosul.edu.iq
Name: Assist. Lecturer. Atyaf Talal Mahmood
Email: .atyaf.alchalabi@uomosul.edu.iq
Name : Assis. Lec. Inas Hazim
Email:enashazim@uomosul.edu.iq

8. Course Objectives

Course Objectives The course teaches the basics of biochemistry and establish the foundations of essential metabolites and macromolecules.	- Amino acids, peptides, proteins, fats, nucleic acids, as well as carbohydrates. - Essentials of enzymes, their names, their mechanism of action, kinetics and inhibition - Plasma membrane, the mechanism of action of hormones and their classification - The basics of clinical nutrition

9. Teaching and Learning Strategies

Strategy	Lecturing Seminars and discussions

	Homework and Quizzes Practical laboratory demonstrations, microscopic slides and Lab book catalogue

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	A1: Students will be able to understand the basic concepts of macromolecules (proteins, enzymes, DNA) and explain their clinical value. B2: Students will be able to develop self-learning skills by reviewing biochemical terms and abbreviations. C1: Students will commit to scientific integrity when dealing with biochemical and medical information.	Introduction to the macromolecules in biochemistry, Definitions and terms; proteins, enzymes, DNA; Clinical value	Theoretical lectures. Laboratory experiments	Paper-based exams
2	3+2	A1: Students will understand the structure of amino acids, their properties, and structural isomerism. B1: Students will be able to use scientific tables and standards to identify amino acids in the laboratory.	Amino acids: Structures of amino acids (table of standard amino acids abbreviation and side chain); Classification, properties, isomerism	Theoretical lectures. Laboratory demonstration.	Paper-based exams
3	3+2	A1: Students will be able to explain the chemical reactions of amino acids and the formation of zwitterions. B1: Students will apply calculation skills to determine the isoelectric point. B2: Students will enhance self-learning skills through solving examples and problems.	Amino acids: Chemical reactions, Zwitter ions, titration curve calculating isoelectric point values. Examples and questions. Non standards A.A: Structures, existence and clinical value	Theoretical lectures. Laboratory demonstration.	Paper-based exa

4	3+2	A1: Students will describe the nature of peptide bonds and the physical properties of peptides. A1: Students will explain the importance of essential peptides in the human body and their clinical value. B1: Students will acquire the skill of identifying peptide reactions in the laboratory.	Peptides: Peptide bond, resonance forms, isomers, physical properties and chemical reactions. Essential poly peptides in human body, structures, roles and clinical values	Theoretical lectures. Laboratory demonstration.	Paper-based exa
5	3+2	A1: Students will explain the four levels of protein structure and their relation to cellular functions. A1: Students will interpret the role of proteins in nutrition and in biological processes such as signaling and transport. B2: Students will develop the ability to conduct self-directed research on complex protein topics.	Proteins: Structure and conformations of proteins, Primary structure, Secondary structure (α helix, β sheet), tertiary structure, quaternary structure. Classification, synthesis, cellular functions (Enzymes, cell signaling, and ligand transport, structural proteins), protein in nutrition	Theoretical lectures. Laboratory experiments.	Paper-based exa
6	3+2	A1: Students will understand methods of protein sequencing and their research importance. B1: Students will recognize laboratory techniques related to protein purification and analysis. B2: Students will develop skills in using electronic resources (Proteomics, Bioinformatics).	Denaturation of proteins and protein sequencing: Determining amino acids composition, N- terminal amino acid analysis, C-terminal A.A analysis, Edman degradation, prediction protein sequence from DNA/ RNA sequences. Methods of protein study: Protein purification, cellular localization,	Theoretical lectures. Laboratory demonstration.	Paper-based exa

			proteomics and bioinformatics, structure predication and simulation		
7	3+2	A1: Students will explain the chemical structure of carbohydrates and their stereoisomerism. A1: Students will connect carbohydrate types to their physiological importance. B1: Students will be able to distinguish between carbohydrates using laboratory techniques.	Carbohydrates: Chemistry and classification, biomedical importance, classification of CHO, Stereochemistry of monosaccharides, metabolism of CHO; Physiologically important monosaccharides, glycosides, disaccharides, polysaccharides	Theoretical lectures. Laboratory demonstration.	Paper-based exa
8	**Mid-term exam**				
9	3+2	A1: Students will describe the structure of lipids and fatty acids and their physiological properties. A1: Students will explain the role of lipids in metabolism and oxidative processes. B1: Students will apply methods for separation and detection of lipids in the laboratory.	Lipids: Introduction, classification of lipids, fatty acids (F.A), nomenclature of F.A, saturated F.A, unsaturated F.A, physical and physiological properties of F.A, metabolism of lipids. Phospholipids, lipid peroxidation and antioxidants, separation and identification of lipids, amphipathic lipids	Theoretical lectures. Laboratory demonstration.	Paper-based exa
10	3+2	A1: Students will explain the general structure of enzymes and mechanisms of catalysis. A1: Students will relate enzyme functions to diseases. B1: Students will practice enzyme	Enzymes: Structures and mechanism, nomenclature, classification, mechanisms of catalysis, thermodynamics, specificity, lock and key model, induced fit model, transition	Theoretical lectures. Laboratory demonstration.	Paper-based exa

		classification in laboratory examples.	state stabilization, dynamics and function, allosteric modulation. Biological function, cofactors, coenzymes, involvement in disease		
11	3+2	A1: Students will explain the general principles of enzyme kinetics. B1: Students will apply calculation skills to determine kinetic constants. B2: Students will strengthen self-learning skills by solving kinetic problems.	Kinetics: General principles, factors effecting enzyme rates (substrate conc., pH, temperature, etc), single-substrate reaction (Michaelis-Menten kinetics), kinetic constants. Examples of kinetic questions and solutions.	Theoretical lectures. Laboratory demonstration.	Paper-based exa
12	3+2	A1: Students will understand the types of enzyme inhibition (competitive and non-competitive). B1: Students will use mathematical approaches to plot and interpret inhibition curves. B3: Students will apply knowledge of inhibition in understanding drug mechanisms.	Enzyme inhibition: Reversible inhibitors, competitive and non competitive inhibition, mixed-type inhibition, Irreversible inhibition. Inhibition kinetics and binding affinities (ki), questions and solutions	Theoretical lectures. Laboratory demonstration.	Paper-based exa
13	3+2	A1: Students will explain mechanisms of enzyme activity regulation and advanced inhibition. B1: Students will apply multi-substrate kinetic models in laboratory settings. B2: Students will develop the ability to follow modern research on non-classical kinetics.	Enzymes: Control of activity and us multi-substrate reactions, ternary-complex mechanisms, ping-pong mechanisms, non-Michaelis-Menten kinetics, pre-steady-state kinetics, chemical mechanisms es of inactivators,	Theoretical lectures. Laboratory demonstration.	Paper-based exa

14	3+2	A1: Students will describe the chemical structure of nucleic acids and their secondary structures. A1: Students will explain base pairing and the importance of supercoiling. A1: Students will understand the relationship between genes and proteins through transcription and translation. B2: Students will enhance self-learning by following modern genetic applications. B3: Students will apply this knowledge in interpreting genetic disorders.	Nucleic Acid: Biological functions of DNA: Chemical structure, nucleic acid components, nucleic acid bases, nucleotides and deoxynucleotides (Properties, base pairing, sense and antisense, super-coiling, alternative structures, quadruple structures, Genes and genomes, transcription and translation, replication	Theoretical lectures. Laboratory demonstration.	Paper-based exa
15	3+2	A1: Students will describe the structure of the plasma membrane and its medical importance. A1: Students will explain the role of membrane proteins in physiological functions. B1: Students will recognize laboratory methods for studying membranes.	Biochemistry of extracellular and intracellular communication: Plasma membrane structure and function; Biomedical importance, membrane proteins associated with lipid bilayer, membranes protein composition, dynamic structures of membranes, asymmetric structures of membranes,	Theoretical lectures. Laboratory demonstration	Paper-based exams

16	3+2	A1: Students will explain the fluid mosaic model and its applications. B1: Students will apply the concept of membrane selectivity in experiments. C1: Students will adhere to professional ethics when discussing artificial membrane applications in medicine.	Artificial membranes model, the fluid mosaic model, membrane selectivity, physiological functions of plasma membranes	Theoretical lectures.	Paper-based exams
17	3+2	A1: Students will explain the classification of hormones and their mechanisms of action on target cells. A1: Students will relate hormone signaling pathways to diseases. B3: Students will use this knowledge to improve pharmaceutical care for patients.	Biochemistry of the endocrine system: Classification of hormones, biomedical importance, the target cell concept and hormone receptors, biochemistry of hormone signal transduction	Theoretical lectures. Laboratory demonstration	Paper-based exams
18	3+2	A1: Students will describe the pathways of digestion and absorption of nutrients and their medical importance. A1: Students will explain energy balance and its relation to health. A1: Students will explain the biochemical basis of hemostasis and blood clotting. B3: Students will use this knowledge to promote community health awareness. C1: Students will commit to ethical	Nutrition, digestion, and absorption: Biomedical importance, digestion and absorption of carbohydrates, lipids, proteins, vitamins and minerals; energy balance. Biochemistry of hemostasis and clot formation	Theoretical lectures. Laboratory demonstration	Paper-based exams

		principles when providing nutritional and medical consultations.			
18	**Students' seminars**				

11. Course Evaluation

- 20 M Theoretical assessment;
  (paper-based mid-term exam + quiz + attendance + seminar)
- 20 M practical assessment (attendance + quiz + practice)
- 60 M paper-based theoretical final exam

Total 100 M

12. Learning and Teaching Resources

Required textbooks	Harper's Illustrated Biochemistry 29th edition
Main references (sources)	lippincotts-biochemistry-6th-edition 2014
Electronic References, Websites	https://pbthru.com/biochemistry-basics https://www.lecturio.com/medical-courses/biochemistry-basics.course#/

Course Description Form

1. Course Name:
Inorganic Pharmaceutical Chemistry
2. Course Code:
Phpch25_312
3. Semester / Year:
1st Semester, 3rd Year
4. Description Preparation Date:
1\9\2025
5. Available Attendance Forms:
Students' signatures on attendance sheets
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours theory + 2 hours practical (60) / 3 units
7. Course administrator's name (mention all, if more than one name)
Theory
Name: Assist. Prof. Dr. Ahmed AJ Mahmood Email: ahmedsot@uomosul.edu.iq Name: Assist. Prof. Dr. Wejdan Nazar Email: wejdan.nazar@uomosul.edu.iq
Practical
Name: Lecturer Sema'a Mahmood Email: seem_univ@uomosul.edu.iq Name: Lecturer Bara Aldabagh Email: bara.aldabagh@uomosul.edu.iq Name: Lecturer Sarah Ahmed Email: sarah.ahmed@uomosul.edu.iq
8. Course Objectives

Course Objectives	• Introducing the students to atoms and elements • Explaining the role of inorganic products in pharmacy

9. Teaching and Learning Strategies

Strategy	• Theory lectures with teaching aids such as videos and diagrams • Practical sessions where students actively perform experiments

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-3	6	• A1_ Understanding the structure of atoms and molecules	• Atomic and molecular structure/ Complexation	• Lectures	• Paper-based exams

4-6	6	• A1_ Understanding the concept of essential and non-essential elements	• Essential and trace ions: Iron, copper, sulfur, iodine • Nonessential ions: Fluoride, bromide, lithium, gold, silver and mercury • Gastrointestinal agents: Acidifying agents	• Lectures	• Paper-based exams
7	2	• A1_ Understanding the concept of The chemistry of antacids	• Antacids	• Lectures	• Paper-based exams
8+9	4	• A1_ Understanding the concept of Miscellaneous inorganic agents	• Protective adsorbents • Topical agents • Dental agents	• Lectures	• Paper-based Exams
10-15	12	• A1_ Understanding the concept of radio therapeutics	• Radiopharmaceutical preparations • Radio opaque and contrast media	• Lectures	• Paper-based Exams
			Practical		
1	2	• B1_ preparing and submitting calcium carbonate (CaCO3).	• To prepare and submit calcium carbonate (CaCO3).	• Practical	• Lab-based unknown and quiz
2	2	• B1_ preparing and submitting magnesium carbonate (MgCO**3**)	• To prepare and submit magnesium carbonate (MgCO**3**)	• Practical	• Lab-based unknown and quiz
3	2	• B1_ preparing and submitting Zinc sulphate (ZnSO4).	• To prepare and submit Zinc sulphate (ZnSO4).	• Practical	• Lab-based unknown and quiz
4	2	• B1_ preparing and submitting Potash alum (K**2**SO**4**. Al**2**(SO**4**)**3** .24 H**2**O)	• To prepare and submit Potash alum (K**2**SO**4**. Al**2**(SO**4**)**3** .24 H**2**O)	• Practical	• Lab-based unknown and quiz

5	2	• B1_ preparing and submitting Boric acid (H3BO3)	• To prepare and submit Boric acid (H3BO3)	• Practical	• Lab-based unknown and quiz
6	2	• B1_ preparing and submitting aluminum hydroxide.	• To prepare and submit aluminum hydroxide.	• Practical	• Lab-based unknown and quiz
7	2	• B2_ performing limit test for chloride in given sample.	• To perform limit test for chloride in given sample.	• Practical	• Lab-based unknown and quiz
8	2	• B2_ performing limit test for sulphate in given sample.	• To perform limit test for sulphate in given sample.	• Practical	• Lab-based unknown and quiz
9	2	• B2_ performing limit test for iron in given sample.	• To perform limit test for iron in given sample.	• Practical	• Lab-based unknown and quiz
10	2	• B3_ Applying identification test for boric acid.	• To perform identification test for boric acid.	• Practical	• Lab-based unknown and quiz
11	2	• B3_ Applying the identification test of ammonium chloride.	• To perform the identification test of ammonium chloride.	• Practical	• Lab-based unknown and quiz
12-15	8	• B4_ distinguishing the cation & anion in given pharmaceutical compounds.	• To identify cation & anion in given pharmaceutical compounds.	• Practical	• Lab-based unknown and quiz

11.Course Evaluation

- 20% Theoretical assessment (paper-based midterm exam, attendance)
- 20% Practical assessment (attendance, quizzes, unknows, reports)
- 60% paper-based theoretical final exam

Total: 100%

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Block, Roche Soine and Wilson, Inorganic Medicinal and Pharmaceutical Chemistry,1986.

Main references (sources)	Wilson and Gisvold Textbook of Organic medicinal and pharmaceutical chemistry, Delgado JN, Remers WA, (Eds); 12thedition,2010 Laboratory Handbook for Practical Inorganic Pharmaceutical Chemistry adopted by the department.
Electronic References, Websites	https://youtu.be/kFfH0uLDdqI?si=uxchZbp6JCibFvvy
Curriculum development	50%

Course Description Form

1. Course Name:
Pathophysiology (Theoretical+ Practical)
2. Course Code:
Phcls25 313
3. Semester / Year:
Year 3, First semester/2025-2026
4. Description Preparation Date:
01/9/2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical (75) /4 units
7. Course administrator's name
Theoretical
Name: Assist. Prof Dr. Abdulla Aqeel Altayyar Email: abdulla.a.ahmad@uomosul.edu.iq Name: Assist. Prof Dr. Ali Saeed AlChalabi Email: alchalabi@uomosul.edu.iq Lecturer Dr. Ahmed Mohammed Ibrahim Email: drahmedmias@uomosul.edu.iq Assist. Lecturer Omar Bassam Agha Email: Patho.omar@uomosul.edu.iq
Practical
Lecturer Dr. Ahmed Mohammed Ibrahim Email: drahmedmias@uomosul.edu.iq Name: Assist. Prof Dr. Abdulla Aqeel Altayyar Email: abdulla.a.ahmad@uomosul.edu.iq Name: Assist. Prof Dr. Ali Saeed AlChalabi Email: alchalabi@uomosul.edu.iq Assist. Lecturer Omar Bassam Agha Email: Patho.omar@uomosul.edu.iq
8. Course Objectives

Course Objectives The course identifies the basic knowledge about important diseases at the cellular level	This course provides students with a comprehensive understanding of basic and systemic pathophysiology emphasizing the mechanisms of cell injury, inflammation, tissue repair, and the pathophysiologica basis of cardiovascular, renal, respiratory, gastrointestinal, endocrine, reproductive, rheumatolog and immune disorders.

9. Teaching and Learning Strategies	
Strategy	Lecturing Seminars Quiz Practical laboratory demonstrations of macroscopic and microscopic pictures.

10. Course Structure

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

1	3+2	A1: The student explains the fundamental concepts of pathophysiology and the mechanisms linking functional disturbances to clinical manifestations.	Overview of syllabus	Theoretical lectures. Laboratory experiments	Paper-based exams
2	3+2	A2: The student describes the molecular mechanisms of cell injury, patterns of cell death, cellular adaptations, and the resulting inflammatory response.	Cell injury and tissu response	Theoretical lectures. Laboratory demonstration.	Paper-based exams
3	3+2	A1: The student explains the roles of oxidative stress, inflammation, and tissue repair in the progression of acute and chronic diseases.	Cell injury and tissu response	Theoretical lectures. Laboratory demonstration.	Paper-based exams
4	3+2	A1: The student explains the pathophysiological mechanisms of cardiovascular diseases and correlates them with hemodynamic changes and therapeutic interventions.	Disorders of cardiovascular syste	Theoretical lectures. Laboratory demonstration.	Paper-based exams
5	3+2	A2: The student describes the pathophysiology of renal dysfunction and its impact on fluid, electrolyte, and acid–base balance	Disorders of renal system	Theoretical lectures. Laboratory experiments.	Paper-based exams
6	3+2	A1: The student explains the pathophysiological basis of CNS disorders and correlates lesion localization with clinical manifestations.	Disorders of the cent nervous system	Theoretical lectures. Laboratory demonstration.	Paper-based exams
7	3+2	A2: The student describes the pathophysiology of ventilation–perfusion abnormalities and respiratory failure.	Disorders of respirat system	Theoretical lectures. Laboratory demonstration.	Paper-based exams
8	**Mid-term exam**				
9	3+2	A2: The student describes the	Disorders of the endocrine system	Theoretical lectures.	Paper-based exams

		pathophysiological mechanisms of major endocrine axis disorders and alterations in feedback regulation.		Laboratory demonstration.	
10	3+2	A1: The student explains the pathophysiology of metabolic disorders, diabetes, and calcium homeostasis and their systemic complications	Disorders of the endocrine system I	Theoretical lectures. Laboratory demonstration.	Paper-based exams
11	3+2	A2: The student describes the mechanisms underlying altered bone remodeling and joint pathology.	Disorders of the skel system	Theoretical lectures. Laboratory demonstration.	Paper-based exams
12	3+2	A1: The student explains the pathophysiological mechanisms of gastrointestinal and liver diseases and their metabolic consequences.	Disorders of GI and hepatobiliary systems	Theoretical lectures. Laboratory demonstration.	Paper-based exams
13	3+2	A1: The student explains the mechanisms of hypersensitivity, autoimmunity, and immunodeficiency and their pathological consequences.	Disorders of immur responses	Theoretical lectures. Laboratory demonstration.	Paper-based exams
14	3+2	A2: The student describes the molecular and cellular mechanisms of tumor initiation, progression, and metastasis and their therapeutic implications.	Neoplasia	Theoretical lectures. Laboratory demonstration.	Paper-based exams
15	**Students' seminars**				

11. Course Evaluation

- 25 M Theoretical assessment;
  (paper-based mid-term exam + quiz)
- 25 M practical assessment (quiz)
- 50 M paper-based theoretical final exam

Total 100 M

12. Learning and Teaching Resources

Required textbooks	1. Essentials of Pathophysiology: Concepts of Altered States (Fourth Edition) by Carol Porth PhD (2014)
Main references (sources)	1. Robbins Basic Pathology 10th Editic March 8, 2017. Editors: Vinay Kun Abul Abbas, Jon Aster
Electronic References, Websites	https://youtu.be/UP1aZKQjINo
Curriculum development	5%

Course Description Form

1. Course Name:

Pharmaceutical Technology I (Theoretical+ Practical)

2. Course Code:

Phind25 314--

3. Semester / Year:

1st Semester/3rd year

4. Description Preparation Date:

01/9/2025

5. Available Attendance Forms:

Students' signature on attendance sheet

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

3 hours Theoretical + 2 hours Practical (75) /4 units

7. Course administrator's name

Theoretical

Name: Assistant professor Dr. Mohanad Alfahad
Email: dr.ma.alfahad@uomosul.edu.iq
Name : Assis. Professor Ghayth Abdulrazzaq
Email: ghayth.abdulrazzaq@uomosul.edu.iq

Practical

Name: Assis. Lec. Noora Thamer
Email: noora.aldabbagh88@uomosul.edu.iq

8. Course Objectives

Course Objectives

To teach theoretical bases for the technology of preparing different dosage forms with respect to their raw materials, compositions, methods of preparation, stability, storage and uses

9. Teaching and Learning Strategies

Strategy	Lecturing Seminars Homework Quiz Practical laboratory demonstrations

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	A1: Define Preformulation A2: List the tests required to do the preformulation and how to interpret their results	Preformulation	Theoretical lectures. Laboratory experiments	Paper-based exams
2	3+2	A1: Define solubility and describe how different factors increase or decrease	Solubility: Factors affecting solubility expression of dissolution; dissolut rate versus solubilit	Theoretical lectures. Laboratory demonstration.	Paper-based exams

		solute solubility in a given solvent.	preparation of solutic containing non-volat materials.		
3	3+2	B2: Compare and contrast liquid dosage forms to traditional oral dosage forms.	Official solutic classification official solutic preparation and use	Theoretical lectures. Laboratory demonstration.	Paper-based exams
4	3+2	B2: Compare and contrast liquid dosage forms to traditional oral dosage forms.	Aqueous soluti containing aroma principles; aroma waters; methods preparations; stabil	Theoretical lectures. Laboratory demonstration.	Paper-based exams
5	3+2	B2: Compare and contrast liquid dosage forms to traditional oral dosage forms.	Syrups: sugar ba syrups; artificial sorbitol based syru stability of syrups.	Theoretical lectures. Laboratory experiments.	Paper-based exams
6	3+2	C2: Evaluate and select a proper solvent and delivery system for a given solute, purpose, and/or patient population	Preparation of solutions using mix solvent systems; spirits, and elixirs.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
7	3+2	C2: Evaluate and select a proper solvent and delivery system for a given solute, purpose, and/or patient population	Extraction; maceration and percolation.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
8	**Mid-term exam**				
9	3+2	C2: Evaluate and select a proper solvent and delivery system for a given solute, purpose, and/or patient population	Tinctures; fluid extracts; extracts resins and oleoresins.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
10	3+2	A1: Define clarification process and explain its essential elements	Definition and methods of clarification; filte aids in clarificatic	Theoretical lectures. Laboratory demonstration.	Paper-based exams
11	3+2	A2: Differentiate between a suspension, an emulsion, a gel, and a magma	Dispersed system their classificatio comparisons between different systems.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
12	3+2	A1: Define and differentiate the following terms from one another:	Colloidal dispersions; lyophilic; lyophobic.	Theoretical lectures.	Paper-based exams

		Lyophobic, Lyophilic, Hydrophobic, Hydrophilic, Amphiphilic		Laboratory demonstration.	
13	3+2	A1: Define suspension and explain its advantageous and disadvantages	Coarse dispersion suspensions.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
14	3+2	A2: Identify the desired features in a suspension and explain how these benefit patient administration. B2: Explain the role of suspending agents when added to a dispersion medium	Coarse dispersion suspensions.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
15	**Students' seminars**				

11. Course Evaluation

- 20 M Theoretical assessment;
  (paper-based mid-term exam + quiz + attendance + seminar)
- 20 M practical assessment (attendance + quiz + practice)
- 60 M paper-based theoretical final exam

100 M total

12. Learning and Teaching Resources

Required textbooks	1. Ansel's pharmaceutical dosage forms and drug delivery system, Ninth Edition. Aulton's Pharmaceutics The Design a Manufacture of Medicines Sixth Edition
Main references (sources)	1. Encyclopedia of pharmaceuti technology, third edition
Electronic References, Websites	http://www.thepoint.lww.com/Allen9e

Course Description Form

1. Course Name:
Pharmacognosy II (Theoretical+ Practical)
2. Course Code:
Phcog25_315--
3. Semester / Year:
Second semester/2025-2026
4. Description Preparation Date:
01 /09/2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours Theoretical + 2 hours Practical (30) /3 units
7. Course administrator's name
Theoretical
Name: Assist. Prof Dr. Mohanned Emad Qazzaz Email: mohannad.qazzaz@uomosul.edu.iq Dr. Zainab Haitham Email: zainabh@uomosul.edu.iq Dr. Khadija Younis Email: khadejaalabidalwaahed@uomosul.edu.iq
Practical
Lecturer Dr. Ban Ahmed Email:ban-alnuaimy67@uomosul.edu.iq Assist. Lecturer: Zena Email: zena.sideeq@uomosul.edu.iq Assist. Lecturer: Samara Sameer Email: samara.sameer@uomosul.edu.iq Assist. Lecturer: Sura Maan Salim Email: sura.maan@uomosul.edu.iq Assist. Lecturer: Noor Saad Email: noormahmoodph88@gmail.com
8. Course objectives

• Define the metabolic pathways of primary and secondary materials and their sources in plants.
• Define carbohydrates, their types, and their importance, and explain the metabolic and structural pathways.
• Define glycosides, their types, and their therapeutic importance.
• Define fats and oils, their importance, methods of isolating them, their therapeutic benefits, and explain their biological pathways.
• Define amino acids and vitamins, their types, and their medicinal benefits.

Separation of Volatile and Fixed Oils
• Practical training on separating volatile and fixed oils.
• Identify the food and pharmaceutical applications of volatile and fixed oils.
• Separation of Glycosides
• Separation and detection of glycosides
• Identify the nature and chemical structure of glycosides.
• Study their pharmacological properties.
• Distinguish between their different types

8. Learning and comprehension strategies

• Lectures and interactive demonstrations
• Learning based on examples of common clinical cases
• Guided self-learning
• Dialogue and discussion
• Various assessment strategies, laboratory demonstrations, and clarification of the extraction process

8. Course structure

Evaluation methods	Learning methods	Topic names	Learning outcomes	Watches	week
•Tests and exams • Discussions	Interactive lectures Dialogue and discussion Self-paced learning	**Introduction: General biosynthesis pathways of secondary metabolites**	A1: Students should be able to identify the general biosynthetic pathways of secondary metabolites in plants. A2: Students should be able to evaluate the therapeutic importance and possible toxicity of	**2+2**	**1**

			some biosynthetic pathways. B2: Students should be able to develop self-learning skills in linking biochemistry with natural products. C1: Students should be able to share scientific ideas on the role of secondary metabolites in therapy within an ethical context.		
•Tests and exams • Discussions	Interactive lectures Dialogue and discussion Self-paced learning	**Carbohydrates**	A1: Students should be able to recognize the chemical structures of natural carbohydrates and their plant sources. A2: Students should be able to understand the physiological roles of carbohydrates and how diseases affect them. B3: Students should be able to apply scientific knowledge to provide pharmaceutical advice regarding carbohydrate-containing compounds	2+2	**2**
•Tests and exams • Discussions	Interactive lectures Dialogue and discussion Self-paced learning	Glycosides: Biosynthesis, physical and chemical properties; cardiac glycosides; saponin glycosides; anthraquinone glycosides; flavonoid	A1: Students should be able to describe the physical and chemical properties of different glycosides. A2: Students should be able to assess the toxicity and side effects of cardiac and other glycosides. B4: Students should be able to identify	**2+2**	**3**

		glycosides; cyanophore lycosides	potential drug interactions and evaluate therapy appropriateness for patients.		
•Tests and exams • Discussions	-Interactive lectures -Dialogue and discussion -Self-paced learning	Glycosides (isothiocyanate, aldehyde, alcoholic, phenolic, lactone, coumarins, (chromones	A1: Students should be able to recognize the structural features of additional glycoside groups. A2: Students should be able to compare the therapeutic effects and toxicity of these compounds. B2: Students should be able to enhance self-learning skills by analyzing pharmaceutical examples.	**2+2**	**4**
•Tests and exams • Discussions	-Interactive lectures -Dialogue and discussion Self-paced - learning	Resins and resin combination; tannins	A1: Students should be able to identify the chemical composition and natural properties of resins and tannins. A2: Students should be able to evaluate the therapeutic importance and side effects of these substances. B3: Students should be able to apply their knowledge in providing pharmaceutical advice related to resin use.	**2+2**	**5**
		امتحان نصف الفصل			
•Tests and exams • Discussions	-Interactive lectures -Dialogue and discussion Self-paced - learning	Lipids: fixed oils and waxes	A1: Students should be able to recognize different types of fixed oils and waxes and their plant sources.	**2+2**	**6**

			A2: Students should be able to explain the physiological and therapeutic roles of lipids. B4: Students should be able to determine the safe and effective use of fixed oils in pharmaceutical therapy.		
•Tests and exams • Discussions	-Interactive lectures -Dialogue and discussion Self-paced - learning	**Volatile oils: Introduction; chemistry of volatile oils; biosynthesis of volatile oils; hydrocarbons as volatile oils; alcohols as volatile oils; aldehydes as volatile oils**	A1: Students should be able to describe the basic chemistry and biosynthesis of volatile oils. A2: Students should be able to evaluate the therapeutic uses and toxicity associated with volatile oils. B1: Students should be able to apply laboratory skills to identify volatile oils.	**2+2**	
•Tests and exams • Discussions	-Interactive lectures -Dialogue and discussion Self-paced - learning	**Volatile oils (ketones; phenols; oxides; esters; (phenolic ethers**	A1: Students should be able to recognize the functional groups of volatile oils and their pharmaceutical roles. A2: Students should be able to evaluate the potential side effects and drug interactions of volatile oils. B2: Students should be able to develop self-learning skills through studying clinical cases of volatile oils.	**2+2**	**8**
•Tests and exams • Discussions	-Interactive lectures -Dialogue and discussion Self-paced - learning	**Non-medicinal toxic plants**	A1: Students should be able to identify common examples of toxic non-medicinal plants.	**2+2**	**9**

			A2: Students should be able to evaluate the toxic risks of these plants and prevention strategies. B3: Students should be able to apply knowledge to provide community health advice on toxic plants. C1: Students should be able to enhance their ability to evaluate information within a responsible ethical framework.		
•Tests and exams • Discussions	-Interactive lectures -Dialogue and discussion Self-paced - learning	Vitamins and Amino acids	A1: Students should be able to recognize vitamins and amino acids of pharmaceutical importance. A2: Students should be able to understand their physiological functions and the impact of deficiency or excess. B4: Students should be able to apply their knowledge to provide appropriate therapy for conditions related to vitamin or amino acid deficiencies.	**2+2**	**10**
Final exam					

Course Evaluation
• 20 M Theoretical assessments;

(Paper-based mid-term exam + quiz + attendance)

- 20 M practical assessment (attendance + quiz + practice)
- 60 M paper-based theoretical final exam

Total 100 M

12. Learning and Teaching Resources	
Robbers JE, Speedie MK, Tylor VE, Pharmacognosy a Pharmacobiotechnology; 2nd edition 2008.	Required textbook
Trease and Evans' Pharmacognosy Practical Pharmacognosy techniques and experiment	Main references (sources)
➢ PubMed (https://pubmed.ncbi.nlm.nih.gov/) ➢ Medscape (https://www.medscape.com/) ➢ UpToDate (https://www.uptodate.com/)	websites

Course Description Form

1. Course Name:
Biochemistry II (Theoretical+ Practical)
2. Course Code:
Phcls25 326--
3. Semester / Year:
Second semester/2025-2026
4. /Description Preparation Date:
15/1/2026
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical (75) /4 units
7. Course administrator's name
Theoretical
Name: Assist. Prof. Dr. Jehan Abdulwahab Email: dr.jehan.biochem@uomosul.edu.iq Name: Assist. Prof. Dr. Zaid Muwafaq Younus Email: z.m.younus@uomosul.edu.iq Name: Assist. Prof. Dr. Sameer Mohammed Mahmood Email: sm.mahmood@uomosul.edu.iq Name: Lecturer. Dr. Manal Abdulmunem Ibrahim Email: alfarhamanal@uomosul.edu.iq Name: Lecturer Dr. Hiba Radhwan Tawfeeq Email: hiba.radhwan@uomosul.edu.iq Name: Lecturer Fatimah Haitham Fathi Email: fatma17@uomosul.edu.iq
Practical
Name: Assist. Prof. Dr. Muthear N Dawood Email: muthear78@uomosul.edu.iq Name: Assist. Prof. Dr. Zaid Muwafaq Younus Email: z.m.younus@uomosul.edu.iq Name: Assist. Prof. Dr. Mohammed KJ Alnori Email: alnorimkj@uomosul.edu.iq Name: Assist. Lecturer Atyaf Talal Mahmood Email: atyaf.alchalabi@uomosul.edu.iq Name: Assist. Lecturer Sarah yahya abdulkhaleq yahya albagooa Email: Sarah.albagooa@uomosul.edu.iq Name: Ahmed Mohammed Ibrahim Email: drahmedmias@uomosul.edu.iq Name: Lec. Omer Bassam Salih agha Email:patho.omar@uomosul.edu.iq Name : Lec. Marwa Husameldeen Email: marwaalmola@uomosul.edu.iq Name: Assis. Lec. Sabah Subhi Ismael. Email: barani@uomosul.edu.iq Name : Assis. Lec. Inas Hazim Email:enashazim@uomosul.edu.iq Name: Assıs. Lec.Abeer Hatem Email:abeer.hatem@uomosul.edu

Course Objectives The course teaches the biochemical processes by wh all living organisms sustain life. Metabolism is the s of all chemical processes occurring within living c and organisms.	The course detailed the biochemical reactions accompanied the metabolism of carbohydrates, proteins, and lipids

1. Teaching and Learning Strategies

Strategy	Lecturing Seminars Homework Quiz Practical laboratory demonstrations, clinical blood tests, and general urine examination.

2. Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	**3+2**	A1: Students will be able to understand the concept of bioenergetics and the role of ATP in supporting normal physiological functions and its biomedical importance. A1: Students will be able to explain the relationship between endergonic and exergonic reactions in biological systems. B2: Students will develop self-learning skills by linking energy metabolism to disease conditions.	Bioenergetic	Theoretical lectures. Laboratory experiments	Paper-based exams
2	**3+2**	A1: Students will be able to explain the mechanism of the respiratory chain and oxidative phosphorylation in cellular energy production. A1: Students will relate respiratory chain inhibitors and	Respiratory Chain Oxidative Phosphorylatic	Theoretical lectures. Laboratory demonstration .	Paper-based exams

		uncouplers to pathological conditions. B3: Students will apply this knowledge to understand drug actions and toxic effects related to energy metabolism.			
3	**3+2**	A1: Students will understand the overall organization and integration of metabolic pathways. A1: Students will explain clinical aspects related to metabolic dysregulation. B2: Students will enhance self-learning skills through studying metabolic disorders.	Overview of Metabolism	Theoretical lectures. Laboratory demonstration.	Paper-based exams
4	3+2	A1: Students will be able to describe the reactions and energetics of the citric acid cycle. A1: Students will explain the role of B vitamins in the cycle and the effects of their deficiency. B3: Students will relate citric acid cycle disturbances to clinical conditions.	Citric Acid Cycle		
5	3+2	A1: Students will understand the reactions of glycolysis and the metabolic fates of pyruvate. A1: Students will explain the regulation of glycolysis and its clinical significance.	Glycolysis and Oxidatio Pyruvate	Theoretical lectures. Laboratory demonstration.	Paper-based exams

		B2: Students will develop self-learning skills through analysis of clinical cases.			
6	3+2	A1: Students will explain glycogenesis and glycogenolysis and their role in blood glucose regulation. A1: Students will relate glycogen storage diseases to biochemical defects. B3: Students will apply this knowledge in pharmaceutical care of patients with glucose disorders.	Metabolism of Glycogen	Theoretical lectures. Laboratory experiments.	Paper-based exams
7	3+2	A1: Students will understand gluconeogenesis and its role in maintaining blood glucose levels. A1: Students will explain the Cori cycle and its clinical importance. B3: Students will use this knowledge to provide appropriate pharmaceutical advice.	Gluconeogenesis and Blo Glucose Control	Theoretical lectures. Laboratory demonstration.	Paper-based exams
8	**Mid-term exam**				
9	3+2	A1: Students will explain the pentose phosphate pathway and its biomedical importance. A1: Students will relate PPP defects to oxidative stress-related diseases. B2: Students will enhance self-learning through independent study of alternative glucose pathways.	Pentose Phosphate Pathw	Theoretical lectures. Laboratory demonstration.	Paper-based exams

10	3+2	A1: Students will understand fatty acid biosynthesis and its regulation. A1: Students will explain the relationship between lipogenesis and metabolic diseases. B3: Students will apply this knowledge in nutritional and health counseling.	Biosynthesis of Fatty Aci	Theoretical lectures. Laboratory demonstration .	Paper-based exams
11	3+2	A1: Students will explain fatty acid oxidation and energy yield. A1: Students will understand ketogenesis and its regulation in health and disease. B3: Students will relate fatty acid oxidation to clinical conditions such as fasting and diabetes.	Oxidation of Fatty Acids	Theoretical lectures. Laboratory demonstration	Paper-based exams
12	3+2	A1: Students will understand lipoprotein structure and lipid transport mechanisms. A1: Students will relate lipid metabolism disorders to cardiovascular diseases. B3: Students will apply this knowledge in patient counseling.	Lipid Transport and Stora	Theoretical lectures. Laboratory demonstration .	Paper-based exams
13	3+2	A1: Students will explain amino acid pools and protein turnover.	Protein and Amino Acid Metabolism	Theoretical lectures.	Paper-based exams

		A1: Students will understand regulation of protein degradation. B2: Students will enhance self-learning skills in protein metabolism disorders.		Laboratory demonstration.	
14	3+2	A1: Students will explain transamination and ammonia assimilation reactions. A1: Students will understand the synthesis of nonessential amino acids and specialized derivatives. B1: Students will recognize these reactions in a laboratory environment.	Biosynthesis of Nonessential Amino Acids	Theoretical lectures. Laboratory demonstration.	Paper-based exams
15	3+2	A1: Students will explain deamination reactions and the urea cycle. A1: Students will relate urea cycle disorders to clinical manifestations. B3: Students will apply this knowledge in monitoring patient therapy.	Catabolism of Proteins ar Amino Acid Nitrogen	Theoretical lectures. Laboratory demonstration.	Paper-based exams
16	3+2	A1: Students will understand the metabolic fate of amino acid carbon skeletons. A1: Students will explain diseases	Catabolism of Carbon Skeletons of Amino Acid	Theoretical lectures. Laboratory demonstration.	Paper-based exams

		related to amino acid catabolism. B2: Students will develop self-learning skills in studying inherited metabolic disorders.			
17	3+2	A1: Students will explain the conversion of amino acids into specialized biologically active compounds. A1: Students will relate these products to neurotransmitter and hormone synthesis. B3: Students will apply this knowledge to improve healthcare services.	Conversion of Amino Ac to Specialized Products	Theoretical lectures. Laboratory demonstration .	Paper-based exams
18	3+2	A1: Students will explain heme biosynthesis and regulation. A1: Students will relate defects in heme metabolism to jaundice and porphyria. B3: Students will use this knowledge to interpret clinical cases. C1: Students will adhere to ethical principles when dealing with patients suffering from blood disorders.	Porphyrins and Bile Pigments	Theoretical lectures. Laboratory demonstration .	Paper-based exams
19	**Students' seminars**				
3. Course Evaluation					
• 20 M Theoretical assessment; (paper-based mid-term exam + quiz + attendance + seminar)					

- 20 M practical assessment (attendance + quiz + practice)
- 60 M paper-based theoretical final exam

Total 100 M

4. Learning and Teaching Resources	
Required textbooks	Harper's Illustrated Biochemistry 29th edition
Main references (sources)	Lippincott-biochemistry-6th-edition 2014
Electronic References, Websites	https://pbthru.com/biochemistry-basics https://www.lecturio.com/medical-courses/biochemistry-basics.course#/

Course Description Form

1. Course Name:
Organic Pharmaceutical Chemistry- I
2. Course Code:
Phpch25_328
3. Semester / Year:
2nd Semester, 3rd Year
4. Description Preparation Date:
15\1\2026
5. Available Attendance Forms:
Students' signatures on attendance sheets
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours theory + 2 hours practical (75) / 4 units
7. Course administrator's name (mention all, if more than one name)
Theory
Name: Assist. Prof. Dr. Mohammed Najim Abed Email: m.n.abed@uomosul.edu.iq Name: Assist. Prof. Dr. Mahmood Hashim Mahmood Email: mh.jasim@uomosul.edu.iq Name: Assist. Prof. Dr. Wejdan Nazar Email: wejdan.nazar@uomosul.edu.iq
Practical
Name: Lecturer Sema'a Mahmood Email: seem_univ@uomosul.edu.iq Name: Lecturer Bara Aldabagh Email: bara.aldabagh@uomosul.edu.iq Name: Lecturer Sarah Ahmed Email: sarah.ahmed@uomosul.edu.iq
8. Course Objectives

Course Objectives	• Introducing the students to pharmaceutical chemistry • Explaining modern drug design techniques • Introducing drug metabolism
9. Teaching and Learning Strategies	
Strategy	• Theory lectures with teaching aids such as videos and diagrams • Practical sessions where students actively perform experiments

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1+2	4+4	• A1_ Understanding the role of pharmaceutical	• Drug Design Strategies. • Drug distribution	• Lectures	• Paper-based exams

		chemistry in drug distribution • A2_ realizing redox reactions	• Redox reactions	• Practical	• Lab-based unknows
2+3	3+4	• A1_ Understanding the effect of chemical properties on drug action • A2_ realizing redox reactions	• Acid-base properties • Redox reactions	• Lectures • Practical	• Paper-based exams • Lab-based quiz
3+4	5+2	• A1_Understanding the concept of QSAR in drug design • A2_ realizing redox reactions	• Statistical prediction of pharmacological activity • Redox reactions	• Lectures • Practical	• Paper-based exams • Lab-based quiz
5+6+7	9	• B1_ Applying the concepts of computer simulations to drug design	• Molecular modeling (Computer aided drug design) • Drug receptor interaction: force involved • Steric features of drugs • Optical isomerism and biological activity • Calculated conformation • Three- dimensional quantitative structure activity relationships and databases • Isosterism • Drug-receptor interaction and subsequent events	• Lectures	• Paper-based Exams
5+6	4	• B2_ Analyzing the Assay of ferrous sulfate.	• Assay of ferrous sulfate	• Practical	• Lab-based unknown and quiz

7+8	4	• B3_ Preparing and standardizing of 0.1Na2S2O4 solution	• Preparation and standardization of 0.1Na2S2O4 solution	• Practical	• Lab-based unknown and quiz
8-15	24	• A1_Understanding the concept of drug metabolism and the factors affecting it.	• Metabolic Changes of Drugs and Related Organic Compounds. • Phase I Oxidation reaction. • Phase I Reductive reaction. • Phase I Hydrolytic reaction. • Phase II. • Factor affecting drug metabolism. • Stereochemical Aspects of Drug Metabolism. • Pharmacologically Active Metabolites. • Prpdrugs.	• Lectures	• Paper-based exam
9+10	4	• B2_ Analyzing the Assay of copper sulfate	• Assay of copper sulfate	• Practical	• Lab-based unknown and quiz
11+12	4	• B2_ Analyzing the Assay of Chlorinated Lime	• Assay of Chlorinated Lime	• Practical	• Lab-based unknown and quiz
13+14	4	• B3_ Preparing and assay of Lugol's Solution	• Preparation and assay of Lugol's Solution	• Practical	• Lab-based unknown and quiz
15	2	• B2_ Analyzing the Assay of Alum	• Assay of Alum	• Practical	• Lab-based unknown and quiz

11.Course Evaluation

- 20% Theoretical assessment (paper-based midterm exam, attendance)
- 20% Practical assessment (attendance, quizzes, unknows, reports)
- 60% paper-based theoretical final exam

Total: 100%

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Wilson and Gisvold Textbook of Organic medicinal and pharmaceutical

	chemistry, Delgado JN, Remers WA, (Eds); 12thedition, 2010 Laboratory Handbook for Practical Pharmaceutical Chemistry adopted by the department.
Main references (sources)	Wilson and Gisvold Textbook of Organic medicinal and pharmaceutical chemistry, Delgado JN, Remers WA, (Eds); 12thedition, 2010 Laboratory Handbook for Practical Pharmaceutical Chemistry adopted by the department.
Electronic References, Websites	https://youtu.be/SHXKxDr-TUg?si=Jux2lKa4n0MGy5m8 https://youtu.be/A16LzbyAHw4?si=5i-_4Rf2Jio6WSCt
Curriculum development	5%

Course Description Form

1. Course Name:
Pharmaceutical & Cosmetic Preparations (Theoretical+ Practical)
2. Course Code:
Phind25 329-
3. Semester / Year:
Second semester/2025-2026
4. Description Preparation Date:
25/3/2026
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical (75) /4 units
7. Course administrator's name
Theoretical
Name: Thamer A Omar Email: thamer.omar@uomosul.edu.iq Ghayth M Abdulrazzaq Email: **ghayth.abdulrazzaq@uomosul.edu.iq**
Practical
Dr. Noora Thamer Email: noora.aldabbagh88@uomosul.edu.iq Zahraa Hussein Email: zahraa.2021@uomosul.edu.iq
8. Course Objectives
Course Objectives To teach theoretical bases for the technology of preparing different dosage forms with respect to their raw materials, compositions, methods of preparation, stability, storage and uses; in addition to define a characterize the possible incompatibilities that may occur in dosage forms
9. Teaching and Learning Strategies

Strategy	Lecturing Seminars Homework Quiz Practical laboratory demonstrations

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	Introduction Definition of emulsion Types of emulsion and terminology Classification of emulsions according to -physical state -route of	Emulsion	Theoretical lectures. Laboratory experiments	Paper-based exams

		administration Disadvantage of emulsion Theory of emulsion			
2	3+2	Main properties Types Calculation of concentration of SAA Small Scale Large scale main method of emulsification	Emulsifying agents Methods of preparat of emulsion	Theoretical lectures. Laboratory demonstration.	Paper-based exams
3	3+2	stability of emulsions terms associated with emulsions storage of emulsion preservation	Emulsion	Theoretical lectures. Laboratory demonstration.	Paper-based exams
4	3+2	Definition Advantages Route of administration Site of drug delivery Supp. Shapes Types and example of Suppository Fate of Suppository	Suppositories a Inserts	Theoretical lectures. Laboratory demonstration.	Paper-based exams
5	3+2	Ideal properties Types of bases Suppository Molds Determination of the amount of base* Vaginal Inserts* Packaging and Storage*	Suppository Bases Methods of preparation	Theoretical lectures. Laboratory experiments.	Paper-based exams
6	3+2	introduction ldeal properties of ointment base types of ointment bases(USP) comparison between the ointment bases Selection of ideal ointment base	Semisolids	Theoretical lectures. Laboratory demonstration.	Paper-based exams
7	3+2	Preparation of ointment COMPENDIAL REQUIREMENTS FOR OINTMENTS ophthalmic ointment	Semisolids	Theoretical lectures. Laboratory demonstration.	Paper-based exams

		(sterile ointment) Creams (vanishing creams) Definition pastes definition gels definition			
8	**Mid-term exam**				
9	3+2	Toners and astringents Introduction Product nomenclature Formulation considerations Formulation Challenges Ingredient and Vehicle Stability and Compatibility Considerations Uses in dermatology Adverse reaction	Cosmetic Formulations	Theoretical lectures. Laboratory demonstration.	Paper-based exams
10	3+2	Antiperspirants : Introduction Function of antiperspirants Function of deodorants Formulation	Cosmetic Formulations	Theoretical lectures. Laboratory demonstration.	Paper-based exams
11	3+2	Sunscreens: Introduction Function Limitations of the SPF test Active Ingredients: UV Filters Products Aesthetics/Skin Feel Formulation challenges Regulatory issues	Cosmetic Formulations	Theoretical lectures. Laboratory demonstration.	Paper-based exams
12	3+2	Anti-aging skin care formulations: Forms Mechanisms Efficacy Product/Formulation Challenges	Cosmetic Formulations	Theoretical lectures. Laboratory demonstration.	Paper-based exams
13	3+2	Topical Exfoliative: Introduction Physical exfoliants Chemical exfoliation	Cosmetic Formulations	Theoretical lecture	Paper-based exams

		Exuviating Compounds			
14	3+2	Herbs in cosmeceuticals: Introduction Processing botanicals Herbs utilized for skin care:Hydrating, soothing, and cleansing Herbs utilized for skin care:Anti-oxidant and brightening Herbs utilized for Acne Herbs utilized for hair care	Cosmetic Formulations	Theoretical lectures.	Paper-based exams
15	3+2	introduction types of incompatibility Physical Incompatibility chemical incompatibility	Pharmaceutical Incompatibility	Theoretical lectures. Laboratory demonstration.	Paper-based exams

11. Course Evaluation

- 20 M Theoretical assessment;
  (paper-based mid-term exam + quiz + attendance + seminar)
- 20 M practical assessment (attendance + quiz + practice)
- 60 M paper-based theoretical final exam

Total 100 M

12. Curriculum update percentage

About 5 %

13. Learning and Teaching Resources

Required textbooks	1. Ansel's pharmaceutical dosage forms and drug delivery system, 11th Edition.
Main references (sources)	1. Encyclopedia of pharmaceut technology, third edition
Electronic References, Websites	http://www.thepoint.lww.com/Allen9e

Course Description Form

1. Course Name:
Pharmacognosy III (Theoretical+ Practical)
2. Course Code:
Phcog26-3210--
3. Semester / Year:
2nd Semester/3rd year
4. Description Preparation Date:
01/09/2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours Theoretical + 2 hours Practical (30) /3 units
7. Course administrator's name
Theoretical
Name: Assist. Prof. Dr. Mohannad Emad Email: mohannad.qazzaz@uomosul.edu.iq Assist. Prof. Dr. Zainab Haitham Email: zainabh@uomosul.edu.iq Assist. Prof. Dr. Khadeja Younus Email: khadejaalabidalwaahed@uomosul.edu.iq
Practical
Lecturer: Dr. Ban Ali Email: ban-alnuaimy67@uomosul.edu.iq Assist. Lecturer: Zena Sideeq Email: zena.sideeq@uomosul.edu.iq Assist. Lecturer: Samara Sameer Email: samara.sameer@uomosul.edu.iq Assist. Lecturer: Sura Maan Salim Email: sura.maan@uomosul.edu.iq Pharmacist: Mayada Muhammed Email: Mayadamohammed@unmousl.edu.iq
8. Course Objectives
Alkaloids: General Concepts • Definition of alkaloids and their chemical and pharmacological classification. • Identification of their plant and animal sources. • Understanding their therapeutic importance and toxicity. **Ornithine-derived Alkaloids** • Explanation of the biosynthetic pathway of these compounds. • Differentiation of the main tropane alkaloids (e.g., atropine and scopolamine). • Clarification of their medical and pharmaceutical applications. **Isolation of Alkaloids from *Peganum harmala*** • Practical training on extraction methods of alkaloids from plants.

- Identification of purification techniques using solvents.
- Understanding the therapeutic applications and toxicity of harmala alkaloids.

Pyrrolizidine Alkaloids (derived from Lysine)

- Identification of chemical structures and toxicity of this class.
- Study of the main plants containing these compounds.
- Understanding their hepatotoxic risks and clinical significance.

Preparation of Khellin

- Learning the steps of laboratory preparation of a natural compound.
- Understanding the relationship between chemical structure and pharmacological activity.
- Recognizing the importance of khellin compounds in treating cardiovascular and respiratory diseases.

Protoalkaloids (derived from Phenylalanine, Tyrosine, and Dopamine)

- Explanation of the biosynthetic pathway of these compounds.
- Study of important examples such as ephedrine and morphine.
- Understanding their medical uses and physiological effects.

Flavonoids in *Ruta graveolens*

- Identification of flavonoid types in the plant.
- Explanation of their antioxidant and anti-inflammatory properties.
- Understanding methods of isolation and determination of flavonoids.

Benzylisoquinoline and Tetrahydroisoquinoline Derivatives

- Study of chemical structures and biosynthetic pathways.
- Understanding the relationship between structure and pharmacological activity.
- Identification of major pharmaceutical examples such as papaverine.

Extraction of Hesperidin

- Practical training on the extraction of a flavonoid compound.
- Identification of the nutritional and pharmaceutical applications of hesperidin.
- Understanding its role as an antioxidant and a capillary protector.

Monoterpenoid Alkaloids and Glycosides

- Identification of the nature and chemical structure of these compounds.
- Study of their pharmacological properties.
- Differentiation between them and other types of alkaloids.

Isolation of Pectin

- Training on the extraction of pectin from plant sources.
- Understanding its role as a pharmaceutical preparation and food additive.

- Identification of its applications in the pharmaceutical industry.

Amaryllidaceae Alkaloids

- Study of prominent examples such as galanthamine.
- Identification of their applications in the treatment of neurological diseases.
- Understanding the medicinal value of plants belonging to this family.

Extraction of Citric Acid from Lemon Juice

- Practical application of organic acid extraction from plants.
- Identification of the uses of citric acid in food and medicine.
- Understanding its properties as an antioxidant and preservative.

Phenethylisoquinoline Alkaloids

- Identification of their chemical structure and biosynthetic pathways.
- Understanding their pharmacological significance.
- Study of practical examples from pharmaceutical drugs.

9. Teaching and Learning Strategies

Strategy	Lecturing Seminars Homework Quiz Practical laboratory demonstrations and extraction techniques.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+2	**A1** The student defines alkaloids, explains their general concept, and describes their pharmacological importance. **A2** The student explains the biosynthetic pathways of ornithine-derived alkaloids.	Alkaloids; Introduction; Ornithine-derived alkaloids, Tropane alkaloids. Isolation of Peganum harmala alkaloids.	Theoretical lectures Laboratory experiments	Paper-based exams
2	2+2	**B1** The student compares ornithine-derived and lysine-derived alkaloids in terms of structure and	Pyrrolizidine alkaloids, Lysine-derived alkaloids. Preparation of Khellin.	Theoretical lectures Laboratory demonstration	Paper-based exams

		activity. **B2** The student analyzes the relationship between chemical structure and toxicity in pyrrolizidine alkaloids.			
3	2+2	**A1** The student defines alkaloids derived from phenylalanine, tyrosine, and dihydroxyphenylalanine (DOPA). **A2** The student describes the biosynthetic pathways of protoalkaloids and identifies their main examples.	Phenylalanine-, tyrosine- and dihydroxyphenylalanine-derived alkaloids, Protoalkaloids. Flavonoids of Ruta graveolens.	Theoretical lectures Laboratory demonstration	Paper-based exams
4	2+2	**B1** The student compares different types of isoquinoline alkaloids derived from amino acids. **B2** The student analyzes the relationship between chemical structure and pharmacological activity of isoquinoline derivatives. **B3** The student explains the therapeutic importance of hesperidin as an antioxidant and capillary protector.	Benzylisoquinoline derivatives, Tetrahydroisoquinoline. Extraction of hesperidin.	Theoretical lectures Laboratory demonstration	Paper-based exams
5	2+2	**B1** The student compares monoterpenoid alkaloids and glycosides in	Monoterpenoid alkaloids and glycosides. Isolation of pectin.	Theoretical lectures Laboratory demonstration	Paper-based exams

		terms of structure and function. **B2** The student analyzes the relationship between the structure of glycosides and their pharmacological properties.			
6	2+2	**B1** The student compares Amaryllidaceae alkaloids with other alkaloid classes in terms of structure and function. **B2** The student analyzes the relationship between the structure of galanthamine and its therapeutic effect in Alzheimer's disease.	Amaryllidaceae alkaloids. Isolation of citric acid fr lemon juice.	Theoretical lectures Laboratory experiments	Paper-based exams
7	2+2	**C1** The student applies the steps of citric acid extraction from lemon juice using laboratory methods. **C2** The student uses chemical analysis techniques to assess the purity of the extracted sample. **C3** The student evaluates the efficiency of isolation and extraction and identifies the factors influencing the results.	Phenethylisoquinoline alkaloids. Isolation of citric acid fro lemon juice.	Theoretical lectures Laboratory demonstration	Paper-based exams

8	**Mid-term exam**				
9	2+2	**A1** The student defines tryptophan-derived alkaloids and explains their chemical structures and biosynthetic pathways. **A2** The student describes major pharmaceutical examples of these alkaloids such as indole alkaloids (reserpine, emetine).	Volatile oils	Theoretical lectures Laboratory demonstration	Paper-based exams
10	2+2	**A1** The student defines miscellaneous alkaloids and classifies them chemically. **A2** The student understands indolizidine alkaloids and their biological properties. **A3** The student identifies imidazole alkaloids and their natural sources.	Alkaloids	Theoretical lectures Laboratory demonstration	Paper-based exams
11	2+2	**A1** The student defines purine alkaloids and explains their chemical and biological properties. **A2** The student identifies reduced pyridine alkaloids and their classification.	Alkaloids	Theoretical lectures Laboratory demonstration	Paper-based exams
12	2+2	**C1** The student compares the chemical and biological	Alkaloids	Theoretical lectures	Paper-based exams

		properties of terpenoid and steroidal alkaloids. **C2** The student interprets experimental results of preparation and evaluates the effectiveness of the method used.		Laboratory demonstration	
13	2+2	**C1** The student compares the biological activities of flavonoids and antibiotics. **C2** The student interprets isolation and chemical analysis results of flavonoids and evaluates extract purity. **D1** The student applies chemical safety regulations when handling biologically active extracts. **D2** The student adheres to ethical and safe principles in the use of natural preparations and antimicrobial compounds.	Antibiotics	Theoretical lectures Laboratory demonstration	Paper-based exams
14	2+2	**B1** The student is able to isolate pectin from plant sources using appropriate laboratory techniques. **B2** The student applies methods for determining pectin purity and analyzes its	Phytotherapy	Theoretical lectures Laboratory demonstration	Paper-based exams

		physical and chemical properties. **C1** The student interprets isolation results and evaluates the efficiency of the method used. **C2** The student relates the properties of the extracted pectin to its applications in pharmaceutical and food industries.			
15	**Students' seminars**				

11. Course Evaluation

- 20 M Theoretical assessments;
  (paper-based mid-term exam + quiz + attendance + seminar)
- 20 M practical assessment (attendance + quiz + practice)
- 60 M paper-based theoretical final exam

100 M total

12. Learning and Teaching Resources

Required textbooks	1. Robbers JE, Speedie MK, Tylor VE, Pharmacognosy and Pharmacobiotechnology; 2nd edition 2008.
Main references (sources)	1. Trease and Evans' Pharmacognosy 2. Practical Pharmacognosy techniques and experiment
Electronic References, Websites	• PubMed (https://pubmed.ncbi.nlm.nih.gov/) • Medscape (https://www.medscape.com/) • UpToDate (https://www.uptodate.com/)

Course Description Form

1. Course Name:
Pharmacology I
2. Course Code:
Phpht26-3212
3. Semester / Year:
Second semester-2025/2026
4. Description Preparation Date:
1/10/2025
5. Available Attendance Forms:
Excel sheets
6. Number of Credit Hours (Total) / Number of Units (Total)
45 hour/3 units
7. Course administrator's name (mention all, if more than one name)
Theoretical

Name: Assistant Professor Fawaz Abdulghani Mustaffa
Email: : Fawaz.Alassaf@uomosul.edu.iq
Name: Assistant Professor Ammar Abdulrahman Younis
Email: ammara@uomosul.edu.iq
Name: Assistant Professor Adnan Ali Zainal
Email: adnan.zainal2010@uomosul.edu.iq
Name: Lecturer. Dr.Mohammed Daowd Mahmood
Email: Mohameddaowd@uomosul.edu.iq
Name: Lecturer. Dr.Aseel Abdulelah Abdulrahman
Email: Aseel.ahmed@uomosul.edu.iq

8. Course Objectives

Course Objectives	● Learn the basic concepts of pharmacological science, fields and clinical applications. ● Understanding the principles of absorption, distribution, metabolism, and excretion in addition to analyzing the relationship between the dose and response. ● Interpretation of the effect of medications on the autonomic nervous system and its cholinergic and adrenergic parts. ● Learn about the drugs used against viruses, fungi, parasites and worms. ● Analysis of the pharmacological interactions, side effects and making safe and effective treatment decisions.

9. Teaching and Learning Strategies	
Strategy	• Lectures and Interactive Presentations • Case-Based Learning • Interactive Workshops and Seminars • Self-Directed Learning and Research Projects • Different Assessment Strategies

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	A1 to learn the student the concept of general pharmacology B1 to analyze the pharmacological interactions and the side effects of drugs.	General Introduction to Pharmacology	• Lecture • Self-Directed Learning and Research Projects	Quizzes and Exams
1-2	4	A2 To explain the factors that affect the mechanism of drug actions in various clinical cases and the relationship between the drug doses and their effects B1 to analyze the pharmacological interactions and the side effects of drugs.	Pharmacokinetics	• Lecture • Self-Directed Learning and Research Projects	Quizzes and Exams
3	4	A1 to learn the student the concept of general pharmacology A2 To explain the factors that affect the mechanism of drug actions in	Drug Receptor Interaction and Pharmacodynamics	• Lecture • Self-Directed Learning and Research Projects	Quizzes and Exams

		various clinical cases and the relationship between the drug doses and their effects B1 to analyze the pharmacological interactions and the side effects of drugs.			
4	2	A1 to learn the student the concept of general pharmacology A2 To explain the factors that affect the mechanism of drug actions in various clinical cases and the relationship between the drug doses and their effects. B1 to analyze the pharmacological interactions and the side effects of drugs.	The autonomic nervous system (ANS)	• Lecture • Self-Directed Learning and Research Projects	Quizzes and Exams
5-6	6	A1 to learn the student the concept of general pharmacology A2 To explain the factors that affect the mechanism of drug actions in various clinical cases and the relationship between the drug doses and their effects. A3 To understand the mechanism of cholinergic drug actions	Cholinergic system	• Lecture • Self-Directed Learning and Research Projects	Quizzes and Exams

		B1 To analyze the pharmacological interactions and the side effects of drugs. C1 To use this information about the pharmacology and the mode of drug actions and their side effects, and employ it in planning an effective and safe treatment that is proportional to the clinical condition.			
7-8	6	A1 to learn the student the concept of general pharmacology A2 To explain the factors that affect the mechanism of drug actions in various clinical cases and the relationship between the drug doses and their effects. A3 To understand the mechanism of cholinergic drug actions B1 To analyze the pharmacological interactions and the side effects of drugs. C1 To use this information about the pharmacology and the mode of drug actions and their side effects, and employ it in planning an	Adrenergic system	• Lecture • Self-Directed Learning and Research Projects	Quizzes and Exams

		effective and safe treatment that is proportional to the clinical condition.			
	Mid-term exam				
9	2	A1 to learn the student the concept of general pharmacology A2 To explain the factors that affect the mechanism of drug actions in various clinical cases and the relationship between the drug doses and their effects. B1 to analyze the pharmacological interactions and the side effects of drugs.	Principle of antimicrobial therapy	• Lecture • Self-Directed Learning and Research Projects	Quizzes and Exams
9-10	4	A1 to learn the student the concept of general pharmacology A2 To explain the factors that affect the mechanism of drug actions in various clinical cases and the relationship between the drug doses and their effects. A3 To understand the mechanism of cholinergic drug actions B1 To analyze the pharmacological interactions and the	β- lactam and other cell wall synthesis inhibitor antibiotics	• Lecture • Self-Directed Learning and Research Projects	Quizzes and Exams

		side effects of drugs. C1 To use this information about the pharmacology and the mode of drug actions and their side effects, and employ it in planning an effective and safe treatment that is proportional to the clinical condition.			
11-12	4	A1 to learn the student the concept of general pharmacology A2 To explain the factors that affect the mechanism of drug actions in various clinical cases and the relationship between the drug doses and their effects. A3 To understand the mechanism of cholinergic drug actions B1 To analyze the pharmacological interactions and the side effects of drugs. C1 To use this information about the pharmacology and the mode of drug actions and its side effects, and employ it in planning an effective and safe treatment that is	Protein synthesis inhibitors	• Lecture • Self-Directed Learning and Research Projects	Quizzes and Exams

		proportional to the clinical condition.			
12-13	3	A1 to learn the student the concept of general pharmacology A2 To explain the factors that affecting the mechanism of drug actions in various clinical cases and the relationship between the drug doses and its effects. A3 To understand the mechanism of cholinergic drug actions B1 To analyze the pharmacological interactions and the side effects of drugs. C1 To use this information about the pharmacology and the mode of drug actions and their side effects, and employ it in planning an effective and safe treatment that is proportional to the clinical condition.	Quinolones, Folate antagonists, and urinary tract antiseptics	• Lecture • Self-Directed Learning and Research Projects	Quizzes and Exams
13	2	A1 to learn the student the concept of general pharmacology A2 To explain the factors that affect the mechanism of drug actions in various clinical	Antimycobacterial drugs	• Lecture • Self-Directed Learning and Research Projects	Quizzes and Exams

		cases and the relationship between the drug doses and their effects. A3 To understand the mechanism of cholinergic drug actions B1 To analyze the pharmacological interactions and the side effects of drugs. C1 To use this information about the pharmacology and the mode of drug actions and their side effects, and employed it in planning an effective and safe treatment that is proportional to the clinical condition.			
14	2	A1 to learn the student the concept of general pharmacology A2 To explain the factors that affect the mechanism of drug actions in various clinical cases and the relationship between the drug doses and their effects. A3 To understand the mechanism of cholinergic drug actions B1 To analyze the pharmacological interactions and the	Antifungal drugs	• Lecture • Self-Directed Learning and Research Projects	Quizzes and Exams

		side effects of drugs.			
14	2	A1 to learn the student the concept of general pharmacology A2 To explain the factors that affect the mechanism of drug actions in various clinical cases and the relationship between the drug doses and their effects. A3 To understand the mechanism of cholinergic drug actions B1 To analyze the pharmacological interactions and the side effects of drugs.	Antiprotozoal drugs	• Lecture • Self-Directed Learning and Research Projects	Quizzes and Exams
15	2	A1 to learn the student the concept of general pharmacology A2 To explain the factors that affect the mechanism of drug actions in various clinical cases and the relationship between the drug doses and their effects. A3 To understand the mechanism of cholinergic drug actions B1 To analyze the pharmacological interactions and the	Anthelmintic drugs	• Lecture • Self-Directed Learning and Research Projects	Quizzes and Exams

		side effects of drugs.			
15	1	A1 to learn the student the concept of general pharmacology A2 To explain the factors that affect the mechanism of drug actions in various clinical cases and the relationship between the drug doses and their effects. A3 To understand the mechanism of cholinergic drug actions B1 To analyze the pharmacological interactions and the side effects of drugs. C1 To use this information about the pharmacology and the mode of drug actions and their side effects, and employ it in planning an effective and safe treatment that is proportional to the clinical condition.	Antiviral drugs	• Lecture • Self-Directed Learning and Research Projects	
	Final- term exam				

11. Course Evaluation

Evaluation Breakdown for a Total Score of 100:

- 5M (attendance + quiz)
- 25M Mid-term Theoretical assessment (paper-based exam)
- 70 M Final-term Theoretical assessment (paper-based exam)

_____

Total 100 M

12. Learning and Teaching Resources

Required textbooks	"Lippincott Illustrated Reviews Pharmacology" by Karen Whalen, 7th edition (2020).
Main references (sources)	"Basic and Clinical Pharmacology" by Bertram G. Katzung, Susan B. Masters, and Anthony J. Trevor.
Recommended books and references (scientific journals, reports...)	➢ "Rang & Dale's Pharmacology" by James M Ritter, Rod J. Flower, and Graeme Henderson "Goodman & Gilman's: The Pharmacological Basis of Therapeutics" by Laurence L. Brunton, Bjorn C. Knollmann, and Randa Hilal-Dandan.
Electronic References, Websites	○ PubMed (https://pubmed.ncbi.nlm.nih.gov/) ○ Medscape (https://www.medscape.com/) ○ UpToDate (https://www.uptodate.com/) ○ Pharmacology Education Projec (https://pharmacologyeducation.org/)

Course Description Form

1. Course Name:

Pharmacy Ethics

2. Course Code:

Phclp25 327

3. Semester / Year:

2nd Semester/3rd year

4. Description Preparation Date:

1/9/2025

5. Available Attendance Forms:

students list of names

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

One hour (theoretical) per week (total 15 hours)/ 1 unit

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

Name: lecturer Raghad Othman Ahmed
Email: raghad_aldabbagh@uomosul.edu.iq
Name: lecturer Assistance Zahraa Thabit Mahmod
Email : zahraa.mahmod@uomosul.edu.iq

8. Course Objectives

Course Objectiv	• Learning the medical ethics • Learning the ethical considerations in relationship with patients and other health care team

9. Learning Outcomes

1. [Knowledge] Understands the basic ethical concepts used in the pharmacy profession.
2. [Understand] Interprets medical ethical concepts in a manner consistent with patient needs.
3. [Application] Apply basic medical ethical concepts to ensure respect for patient privacy and optimal treatment.
4. [Analysis] Analyzes medical conditions and follows ethical guidelines when treating patients.
5. [Synthesis] Designs a comprehensive treatment plan based on treatment guidelines.
6. [Evaluation] Evaluates the effectiveness and safety of the proposed treatment plan while maintaining patient privacy.

10. Teaching and Learning Strategies

Strategy	• Direct theoretical lectures • Clinical case discussions

11. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	A1: Explains the basic ethical concepts in the pharmacy profession and principles of professional conduct.	Pharmacy ethics	Lecture	Quiz
2	1	B1: Analyzes conflicts of interest, confidentiality, and patients' rights	Pharmacy ethics	Lecture	Quiz

		within pharmacy practice.			
3	1	A2: Identifies key elements of the pharmacists' code of ethics and the pharmacist's responsibilities toward patients and society.	Code of ethics for pharmacists	Lecture	Quiz
4	1	B2: Compares common ethical dilemmas in pharmaceutical care and clarifies decision-making priorities.	Common ethical considerations in pharmaceutical care patients 1	Lecture	Quiz
5	1	B1: Analyzes requirements for privacy, informed consent, and patient communication within pharmaceutical care.	Common ethical considerations in pharmaceutical care patients 2	Lecture	Quiz
6	1	B3: Evaluates ethical scenarios in pharmaceutical care and justifies the most appropriate professional action.	Common ethical considerations in pharmaceutical care patients 3	Lecture	Quiz
7	1	A3: Describes principles of interprofessional relations and their impact on patient safety and quality of care.	Inter-professional relations	Lecture	Quiz
8	1	B2: Compares models of collaboration within the healthcare team and the pharmacist's role in managing professional conflicts.	Inter-professional relations	Lecture	Quiz
9	1	B3: Evaluates steps of ethical decision-making to develop a well-justified professional decision.	Making ethical decisions	Lecture	Quiz
10	1	A1: Explains research ethics in clinical pharmacy, including approvals, confidentiality, and data integrity.	Ethical issues related clinical pharmacy research	Lecture	Quiz

11	1	B1: Analyzes ethical problems in the pharmacist's clinical practice (e.g., medication errors, reporting, and accountability).	Ethical problems in tl pharmacist's clinical practice	Lecture	Quiz
12	1	A2: Identifies strategies to prevent misuse of medicines and the pharmacist's ethical and legal responsibilities.	Preventing misuse of medicines	Lecture	Quiz
13	1	C1: Applies pharmacy ethics principles to realistic clinical case studies.	Case studies in pharmacy ethics 1	Lecture	Quiz
14	1	B3: Evaluates proposed solutions for ethical case studies and justifies the most appropriate intervention.	Case studies in pharmacy ethics 2	Lecture	Quiz
15	1	C1: Applies an ethical decision-making framework to formulate a final recommendation in advanced case studies.	Case studies in pharmacy ethics 3	Lecture	Quiz

12. Course Evaluation

- 30 M mid-term exam + daily quiz
- 70 M final exam
- 100 M total

13. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Ruth Rodgers, (ed.): fast track, law and ethics pharmacy practice. pharmaceutical press, 2010.
Main references (sources)	Joy Wingfield and David Badcott. Pharmacy eth and decision making. Pharmaceutical press, 2007
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:

Biopharmaceutics

2. Course Code:

Phind25_411--

3. Semester / Year:

1st Semester /4th year

4. Description Preparation Date:

01/9/2025

5. Available Attendance Forms:

Students' signature on attendance sheet

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

2 hours Theoretical + 2 hours Practical (60) /4 units

7. Course administrator's name

Theoretical

Name: Assist. Prof Dr. Musab Mohammad Khalaf
Email: Musabph74@uomosul.edu.iq

Name: Assist Dr Omar Abdulhakeem Hamid
Email: omar.hamid@uomosul.edu.iq

Practical

Name: Assist Lec. Mais Salim Saadallaha
Email: drmais@uomosul.edu.iq

8. Course Objectives

1. The concept of biopharmaceutics.
2. Identifying factors that are influencing the bioavailability of a drug; these include
   a. GIT Physiological factors affecting oral dru absorption (oral drugs)
   b. Physicochemical properties of drug itself (solubility and dissolution rate)
   c. The type of dosage form and choice of excipients.
3. Bioavailability and bioequivalence studies.
4. Pharmacokinetics of drug absorption including
   a. One compartment open model.
   b. Multiple compartment models.

9. Teaching and Learning Strategies

Strategy	Lecturing Homework Quiz Practical laboratory demonstration, practice and repots

10. Course Structure

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

1	2+2	Concept of biopharmaceutics, bioavailability and pharmacokinetics	Introduction to Biopharmaceutics	Theoretical lectures.	Paper-based exa
2	2+2	GIT Physiological factors influencing gastrointestinal drug absorption: Gastric emptying time, pH and food	GIT Physiolog factors influenc gastrointestinal drug absorption	Theoretical lectures. Laboratory demonstration.	Paper-based exa
3	2+2	GIT Physiological factors influencing gastrointestinal drug absorption: Mechanisms of drug absorption	GIT Physiolog factors influenc gastrointestinal d absorption	Theoretical lectures. Laboratory demonstration.	Paper-based exa
4	2+2	Drug physicochemical factors influencing drug absorption: Solubility and dissolution	Drug physicochem factors influencing d absorption	Theoretical lectures. Laboratory demonstration.	Paper-based exa
5	2+2	pH- partitioning hypothesis of drug absorption: pKa and dissociation and lipid solubility	pH- partition hypothesis of d absorption	Theoretical lectures. Laboratory experiments.	Paper-based exa
6	2+2	Dosage form factors influencing drug absorption: type of the dosage form	Dosage form factors influencing drug absorption	Theoretical lectures. Laboratory demonstration.	Paper-based exa
7	2+2	Dosage form factors influencing drug absorption: Excipients	Dosage form factors influencing drug absorption	Theoretical lectures. Laboratory demonstration.	Paper-based exa
8	**Mid-term exam**				
9	2+2	Bioavailability and Bioequivalence: Types of bioavailability studies	Bioavailability and Bioequivalence	Theoretical lectures. Laboratory demonstration.	Paper-based exa
10	2+2	Pharmacokinetics: One compartment open model	Pharmacokinetics	Theoretical lectures. Laboratory demonstration.	Paper-based exa

11	2+2	Pharmacokinetics: multiple compartment model	Pharmacokinetics	Theoretical lectures. Laboratory demonstration.	Paper-based exa
12	2+2	Pharmacokinetics: Intra-venous infusion	Pharmacokinetics	Theoretical lectures. Laboratory demonstration.	Paper-based exa
13	2+2	Pharmacokinetics: Protein binding	Pharmacokinetics	Theoretical lectures. Laboratory demonstration.	Paper-based exa
14	2+2	Pharmacokinetics: Dosage regimen	Pharmacokinetics	Theoretical lectures. Laboratory demonstration.	Paper-based exa
15	**Seminars**				

11. Course Evaluation

- 20 M Theoretical assessment;
  (paper-based mid-term exam + quiz + attendance + seminar)
- 20 M practical assessment (attendance + quiz + practice)
- 60 M paper-based theoretical final exam

100 M total

12. Learning and Teaching Resources

Required textbooks	Pharmaceutics The Science of Dosage Form Design 2Ed M.E.Aulton v
Main references (sources)	Shargel L, Yu AB, (Eds.), Applied Biopharmaceutics and Pharmacokinetics; 6th edition,2012.
Electronic References, Websites	https://www.youtube.com/watch?v=5gJxaWep_Dk

Course Description Form

1. Course Name:
Clinical Pharmacy I (Theoretical+ Practical)
2. Course Code:
Phclp25_412
3. Semester / Year:
1st semester/4th year
4. Description Preparation Date:
1/9/2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours Theoretical + 2 hours Practical (60) /3 units
7. Course administrator's name (mention all, if more than one name)
Theoretical
Name: Assist Prof Mohammed Aladul Email: m.i.im.aladul@uomosul.edu.iq Lec. Dr. Harith Kh. Al-Qazaz Email: al_qazaz73@uomosul.edu.iq Lec : Suhair Muyad Rasheed Email : rasheedph@uomosul.edu.iq Name: Lec. Heba M. Attash Email: heba.attash@uomosul.edu.iq Luma. M. Al- Obaidy Email: l.m.saadallah@uomosul.edu.iq
Practical
Zahraa S. Thabit Zahraa.mahmod@uomosul.edu.iq Farah Ramzi Noori farah.ramzi@uomosul.edu.iq Rahma Saad aldain rahma.saadaldain@uomosul.edu.iq Abdallah Thamer abdullah.thamer@uomosul.edu.iq
8. Course Objectives
• Identify common symptoms of common diseases (Knowledge) • Explain the available treatment methods for each case (Comprehension) • Apply an initial treatment plan in a community pharmacy (Application) • Analyze symptoms to determine the type of disease (Analysis) • Develop an appropriate drug plan based on the case (Synthesis) • Evaluate the effectiveness of treatment based on patient improvement (Evaluation)
9. Teaching and Learning Strategies
• Direct theoretical lectures • Clinical case discussions • Educational video presentations • Practical training inside a virtual pharmacy

10. Course Structure					
Week	**Hours**	**Learning Outcomes**	**Topics**	**Learning method**	**Evaluation method**
1	2+2	C1: Applies effective patient communication and counseling skills in community pharmacy practice.	Communication skills with patients	Lecture, Discussion	Written exams
2	2+2	A1: Explains the scope and workflow of community pharmacy practice and the pharmacist's role in primary care.	Introduction to Commur pharmacy	Lecture, Case discussions	Paper-based exams
3	2+2	A2: Identifies common respiratory tract conditions and appropriate initial pharmacotherapy and counseling points.	Diseases of respirat tract 1	Lecture, Case Study	Paper-based exams
4	2+2	B1: Analyzes respiratory symptoms and red flags to differentiate conditions and justify treatment or referral decisions.	Diseases of respirat tract 2	Lecture, Educational Video	Paper-based exams
5	2+2	A3: Describes pharmacotherapy for common pediatric diseases, including dosing considerations and safety precautions.	Pediatrics diseases	Lecture, Discussion	Paper-based exams
6	2+2	A2: Identifies pharmacologic options for common gastrointestinal disorders and key counseling and referral criteria.	Gastrointestinal diseases 1	Lecture, Case Studies	Paper-based exams
7	2+2	B3: Evaluates gastrointestinal case scenarios to ensure appropriate therapy selection, monitoring, and follow-up.	Gastrointestinal diseases 2	Lecture, Clinical Image Presentation	Paper-based exams
8	**Mid-term exam**				
9	2+2	A2: Identifies common skin conditions and appropriate pharmacologic/non-pharmacologic management in	Skin diseases 1	Lecture, Discussion	Paper-base exams

		community pharmacy.			
10	2+2	B2: Compares pharmacologic options for skin diseases based on efficacy, safety, and patient counseling requirements.	Skin diseases 2	Lecture, Case Studies	Paper-based exams
11	2+2	A3: Describes management of common oral cavity diseases, including supportive care and safety considerations.	Oral cavity diseases	Lecture, Discussion	Paper-based exams
12	2+2	B1: Analyzes CNS complaints (insomnia, motion sickness, migraine) to justify initial pharmacotherapy and referral criteria.	CNS diseases (Insomnia Motion sickness Migraine)	Lecture, Clinical Scenario	Paper-based exams
13	2+2	A2: Identifies common ENT and eye conditions and appropriate initial management and referral indications.	ENT diseases (Conjunctivitis, red eye causes. otitis media)	Lecture, Discussion	Paper-based exams
14	2+2	A1: Explains nicotine replacement therapy principles, dosage forms, and essential counseling and monitoring points.	Nicotine replacement therapy & Dosage form of NRT	Lecture, Group Activity	Paper-based exams
15	2+2	B3: Evaluates dietary supplements based on evidence, safety, interactions, and patient-specific considerations.	Types of dietary supplement,	Lecture, Scientific Review	

11. Course Evaluation

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

- 20 M Theoretical assessment;
  (paper-based mid-term exam + quiz)
- 20 M practical assessment (attendance + quiz + practice)
- 60 M paper-based theoretical final exam

100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Community Pharmacy: symptoms, diagno treatment

Main references (sources)	Symptoms in Pharmacy: A guide to the managem of common illness
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	
Update percent	5%

Course Description Form

1. Course Name:
Organic Pharmaceutical Chemistry- II
2. Course Code:
Phpch25_4134
3. Semester / Year:
1st Semester, 4rd Year
4. Description Preparation Date:
21/09/2025
5. Available Attendance Forms:
Students' signatures on attendance sheets
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours theory + 2 hours practical (75) / 4 units
7. Course administrator's name (mention all, if more than one name)
Theory
Name: Assist. Prof. Dr. MahmoodKhudairOglah Email: mahmoodpharm76@uomosul.edu.iq Name: Assist. Prof. Dr. Moath Kahtan Bashir Email: moathkahtan@uomosul.edu.iq
Practical
Name:Lecturer Safaa Polis Behnam Email: safaapk@uomosul.edu.iq Name: Lecturer SawsanHasan Email: sawsan.hasan@uomosul.edu.iq Name: Assist. Lecturer Sarah Sedqi Email: sarahismael86@uomosul.edu.iq
8. Course Objectives

Course Objectives	• Introducing the students to pharmaceutical chemistry • Explain the interaction between chemical structure and Biological activities.
9. Teaching and Learning Strategies	
Strategy	• Theory lectures with teaching aids such as videos and diagrams • Practical sessions where students actively perform experiments

10. Course Structure

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

2+1	3h Theory	A3 – The student should identify the chemical structure of narcotic analgesics as well as non-steroidal analgesics. B4 – The student should analyze the chemical structures of analgesics and understand their side effects and how to manage them.	NSAIDs analgesics	Theoretical lectures. Enrichment lectures delivered through the e-learning platform.	Written exams. Surprise quizzes.
1	2h Practical	A1 – The student should identify the chemical structure of the substance, where it naturally occurs, and its uses. A2 – The student should understand the methods of synthesizing the substance. A3 – The student should understand the role of each component in the reaction and the role of reaction conditions. B1 – The student should determine a synthesis method suitable for the available laboratory conditions. B2 – The student should measure the weights and volumes of reactants and determine reaction conditions such as time and temperature.	Organic synthesis 1-Preparation of Salicylic acid	Lectures Videos Group discussions Homework Classroom discussions Internet resources	Written exams Surprise quizzes Oral exams Reports Evaluation of work methods and adherence to safety procedures

		C – The student should evaluate the efficiency of the synthesis method based on the yield obtained.			
2	2h Practical	A1 – The student should understand the importance of purification and the role of recrystallization in purifying substances. A2 – The student should understand the methods of recrystallization and the solvents used in the process. B1 – The student should select an appropriate recrystallization method and choose a suitable solvent. B2 – The student should measure the solvent used based on the weight of the substance. C1 – The student should evaluate the importance of recrystallization by comparing the crude and purified substances using tests such as melting point, as well as the shape and color of the material.	Re-crystallization of Salicylic acid	Lectures Videos Group discussions Homework Classroom discussions Internet resources	Written exams Surprise quizzes Oral exams Reports Evaluation of work methods and adherence to safety procedures
4+3	3h Theory	A2 – The student should understand the chemical	- Sedative. - Hypnotics. - Anxiolytics.	Theoretical lectures. Enrichment lectures	Written exams. Surprise quizzes.

		structures of drugs used for anxiety.		delivered through the e-learning platform.	
3+4	2h Practical	A1 – The student should identify the chemical structure and uses of aspirin. A2 – The student should understand the methods of synthesizing aspirin and the conditions required for each reaction. A3 – The student should understand the method of recrystallization using two types of solvents. B1 – The student should select a synthesis method suitable for laboratory conditions that is safe and yields good results. B2 – The student should choose appropriate solvents, their proportions, and the required temperature. C1 – The student should evaluate the efficiency of the synthesis method based on the yield obtained. C2 – The student should evaluate the importance of	Synthesis and re-crystallization of aspirin	Lectures Videos Group discussions Homework Classroom discussions Internet resources	Written exams Surprise quizzes Oral exams Reports Evaluation of work methods and adherence to safety procedures

		recrystallization by comparing the crude and purified substance using tests such as melting point, shape, and color.			
5	3h Theory	A2 – The student should understand the chemical structures of drugs used for epilepsy. B4 – The student should analyze the important parts of the compound that produce the biological effect.	Antiepileptics	Lectures Videos Group discussions Homework Classroom discussions Internet resources	Written exams. Surprise quizzes.
6+5	2h Practical	A1 – The student should understand the methods used to measure the concentration of aspirin. B1 – The student should select an aspirin measurement method suitable for laboratory conditions. B2 – The student should explain the reasons for differences in concentration among products from different companies. C1 – The student should determine which products are closest to quality control requirements.	Assay of aspirin Unknown of aspirin	Lectures Videos Group discussions Homework Classroom discussions Internet resources	Unknown samples Written exams Surprise quizzes Oral exams

6	3h Theory	A2 – The student should understand the chemical structures of drugs used for depression. C1 – The student should determine the appropriate drug compound to avoid side effects.	Antidepressant	Lectures Videos Group discussions Homework Classroom discussions Internet resources	Written exams. Surprise quizzes.
8 - 7	3h Theory	A3 – The student should identify the chemical structures of drugs used for psychosis, as well as possible modifications to the chemical structure to improve efficacy. C1 – The student should determine the key parts of the compound that can be modified to avoid adverse side effects.	Antipsychotics	Lectures Videos Group discussions Homework Classroom discussions Internet resources	Written exams. Surprise quizzes.
			Med term exam		
9	3h Theory	A3 – The student should identify the chemical structures of neurotransmitters involved in the autonomic nervous system.	Autonomic Nervous system	Lectures Videos Group discussions Homework Classroom discussions Internet resources	Written exams. Surprise quizzes.
10+9	2h Practical	A – The student should understand sulfa-containing antibiotics and their importance in treating infections. A1 – The student should identify the	Sulfonamide synthesis Preparation of nitrobenzene	Lectures Videos Group discussions Homework Classroom discussions Internet resources	Written exams Surprise quizzes Oral exams Reports Evaluation of work methods and adherence to safety

		chemical structure of the substance, where it naturally occurs, and its uses. A2 – The student should understand the methods of synthesizing the substance. A3 – The student should understand the role of each component in the reaction and the role of reaction conditions. B1 – The student should determine a synthesis method suitable for the available laboratory conditions. B2 – The student should measure the weights and volumes of reactants and determine reaction conditions such as time and temperature. C – The student should evaluate the efficiency of the synthesis method based on the yield obtained.			procedures
10	3h Theory	A2 – The student should understand the chemical structures of drugs used in the parasympathetic nervous system. B4 – The student should analyze the important parts of the	Cholinergic drugs. Anticholinergic drugs.	Lectures Videos Group discussions Homework Classroom discussions Internet resources	Written exams. Surprise quizzes.

		compound that produce the biological effect as well as the adverse effects.			
12+11	2h Practical	A1 – The student should identify the chemical structure and uses of the substance. A2 – The student should understand the methods of synthesis and the conditions required for each reaction. A3 – The student should understand the method of recrystallization using two types of solvents. B1 – The student should select a synthesis method suitable for laboratory conditions that is safe and yields good results. B2 – The student should choose appropriate solvents, their proportions, and the required temperature. C1 – The student should evaluate the efficiency of the synthesis method based on the yield obtained. C2 – The student should evaluate the importance of recrystallization by	Preparation of acetanilide Re-crystallization of acetanilide	Lectures Videos Group discussions Homework Classroom discussions Internet resources	Written exams Surprise quizzes Oral exams Reports Evaluation of work methods and adherence to safety procedures

		comparing the crude and purified substance using tests such as melting point, shape, and color.			
11	3h Theory	A3 – The student should identify the chemical structures of drugs used in the sympathetic nervous system. B4 – The student should analyze the important parts of the compound that produce the biological effect as well as the adverse effects.	Adrenergic drugs. Antiadrenergic drugs.	Lectures Videos Group discussions Homework Classroom discussions Internet resources	Written exams. Surprise quizzes.
12	3h Theory	A3 – The student should identify the chemical structures of drugs used for local and general anesthesia. C1 – The student should determine the key parts of the compound that need to be modified to avoid adverse effects.	Local anesthetics. General anesthetics.	Lectures Videos Group discussions Homework Classroom discussions Internet resources	Written exams. Surprise quizzes.
13	2h Practical	A1 – The student should identify the chemical structure of the substance, where it naturally occurs, and its uses. A2 – The student should understand the methods of synthesizing the substance.	Chlorosulfonation of acetanilide	Lectures Videos Group discussions Homework Classroom discussions Internet resources	Written exams Surprise quizzes Oral exams Reports Evaluation of work methods and adherence to safety procedures

		A3 – The student should understand the role of each component in the reaction and the role of reaction conditions. B1 – The student should determine a synthesis method suitable for the available laboratory conditions. B2 – The student should measure the weights and volumes of reactants and determine reaction conditions such as time and temperature. C – The student should evaluate the efficiency of the synthesis method based on the yield obtained.			
14 -13	3h Theory	A3 – The student should identify the chemical structures of drugs used to treat hypertension. B4 – The student should analyze the important parts of the compound that produce the biological effect as well as the adverse effects.	Drugs affecting cardiovascular system (antihypertensive)	Lectures Videos Group discussions Homework Classroom discussions Internet resources	Written exams. Surprise quizzes.
14	2h Practical	A1 – The student should identify where the substance occurs naturally and its uses.	Amination of p-chlorobenzene sulfonyl chloride	Lectures Videos Group discussions Homework Classroom	Written exams Surprise quizzes Oral exams Reports Evaluation of work methods

		A2 – The student should understand the methods of synthesizing the substance. A3 – The student should understand the role of each component in the reaction and the role of reaction conditions. B1 – The student should determine a synthesis method suitable for the available laboratory conditions. B2 – The student should measure the weights and volumes of reactants and determine reaction conditions such as time and temperature. C – The student should evaluate the efficiency of the synthesis method based on the yield obtained.		discussions Internet resources	and adherence to safety procedures
15	3h Theory	A3 – The student should identify the chemical structures of drugs used to treat hypertension. B4 – The student should analyze the important parts of the compound that produce the biological effect as well as the adverse effects.	Histamine and antihistaminic agents	Lectures Videos Group discussions Homework Classroom discussions Internet resources	Written exams. Surprise quizzes.

15	2h Practical	A1 – The student should understand the methods of synthesizing the substance. A2 – The student should understand the role of each component in the reaction and the role of reaction conditions. B1 – The student should determine a synthesis method suitable for the available laboratory conditions. B2 – The student should measure the weights and volumes of reactants and determine reaction conditions such as time and temperature. C – The student should evaluate the efficiency of the synthesis method based on the yield obtained.	Hydrolysis of p-chlorobenzene sulfonyl chloride	Lectures Videos Group discussions Homework Classroom discussions Internet resources	Written exams Surprise quizzes Oral exams Reports Evaluation of work methods and adherence to safety procedures

11. Evaluation

• 20 marks: Theoretical assessment (written midterm exam, attendance)
• 20 marks: Practical assessment (unknown samples, written exams, surprise quizzes, oral exams, reports, homework)
• 60 marks: Final written theoretical exam
Total: 100 marks

12. Educational Recourses

Textbooks	Wilson and Gisvold Textbook of Organic medicinal and Pharmaceutical chemistry, Delgado JN, Remers WA, (Eds); 12th edition,2010 Graham L. Patrick textbook of An Introducti to

	Medicinal Chemistry, latest edition. Laboratory Handbook for Practical Pharmaceutical Chemistry adopted by the department.
Main Resources	Wilson and Gisvold Textbook of Organic medicinal and pharmaceutical chemistry, Delgado JN, Remers WA, (Eds); 12th edition,2010 Laboratory Handbook for Practical Pharmaceutical Chemistry adopted by the department.
Additional Recourses	
Websites	
Curriculum Update Percentage	Change in the practical component: 3

Course Description Form

1. Course Name:
Pharmacology II (Theoretical+ Practical)
2. Course Code:
Phpht25-414
3. Semester / Year:
First semester/2025-2026
4. Description Preparation Date:
01/9/2025
5. Available Attendance Forms:
Excel sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical /4 units
7. Course administrator's name
Theoretical
Name: Prof. Dr. Zeina Abdulmunim Abdulmajeed Email: Dr.zeina@uomosul.edu.iq Name: Assist. Prof Dr. Musab M Khalaf Email: Musabph74@uomosul.edu.iq Assist. Prof Dr. Hani M Al-Mukhtar Email: Hanialmukhtar@uomosul.edu.iq Assist. Prof. Dr. Ghayth M Abdulrazzaq Email: ghayth.abdulrazzaq@uomosul.edu.iq Assist. Prof. Dr. Adnan Ali Zainal Email: Adnan.zainal2010@uomosul.edu.iq Lecturer Dr. Aseel Abdul Ellah Email: @uomosul.edu.iq Lecturer Dr. Mohammed Daowd Mahmoud Email: Mohameddaowd@uomosul.edu.iq
Practical
Name: Assist. Prof Dr. Musab M Khalaf Email: Musabph74@uomosul.edu.iq Assist. Prof Dr. Hani M Al-Mukhtar Email: Hanialmukhtar@uomosul.edu.iq Assist. Prof. Dr. Ghayth M Abdulrazzaq Email: ghayth.abdulrazzaq@uomosul.edu.iq Assist. Prof. Dr. Adnan Ali Zainal Email: Adnan.zainal2010@uomosul.edu.iq Lecturer Dr. Aseel Abdul Ellah Email: @uomosul.edu.iq Lecturer Dr. Mohammed Daowd Mahmoud Email: Mohameddaowd@uomosul.edu.iq
8. Course Objectives

Course Objectives Basic Knowledge about the pharmacology of drugs used for various systemic diseases including, CNS, CVS,	• Providing students with theoretical knowledge al the mechanism of action of drugs and the side eff they may cause.

GIT, and Respiratory system.	• Training students and developing their skills in practical aspects of pharmacology.

9. Teaching and Learning Strategies

Strategy	Theoretical lectures Assessment exams Homework assignments Practical laboratory sessions Discussions

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	A1. The student should understand the mechanism of action of drugs in detail. A2. The student should understand the importance of knowing the clinical uses of drugs.	Introduction to CNS drugs	- In-person lectures - Blended learning -Laboratory experiments	- Written exams - Seminars and discussion
2	3+2	A1. The student should understand the mechanism of action of drugs in detail. A2. The student should understand the importance of knowing the clinical uses of drugs. B1. The student should be aware of the side effects of drugs.	Antidepressant	- In-person lectures - Blended learning -Laboratory experiments.	- Written exams - Seminars and discussion
3	3+2	A1. The student should understa the mechanism of action of drug detail. A2. The student should recogniz the importance of knowing the clinical uses of drugs. B1. The student should identify t side effects of drugs. B2. The student should analyze c interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.	Antipsychotics	- In-person lectures - Blended learning -Laboratory experiments	- Written exams - Seminars and discussion
4	3+2	A1. The student should understa the mechanism of action of drug detail. A2. The student should recogniz the importance of knowing the clinical uses of drugs. B1. The student should identify t side effects of drugs. B2. The student should analyze c interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the	Opioid drugs	- In-person lectures - Blended learning -Laboratory experiments	- Written exams - Seminars and discussion

		mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.			
5	3+2	A1. The student should understa the mechanism of action of drug detail. A2. The student should recogniz the importance of knowing the clinical uses of drugs. B1. The student should identify t side effects of drugs. B2. The student should analyze c interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.	Anaesthetic drugs	- In-person lectures - Blended learning -Laboratory experiments	- Written exams - Seminars and discus ion
6	3+2	A1. The student should understa the mechanism of action of drug detail. A2. The student should recogniz the importance of knowing the clinical uses of drugs. B1. The student should identify t side effects of drugs. B2. The student should analyze c interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.	CNS stimulants	- In-person lectures - Blended learning -Laboratory experiments	- Written exams - Seminars and discus ion
7	3+2	A1. The student should understa the mechanism of action of drug detail. A2. The student should recogniz the importance of knowing the clinical uses of drugs. B1. The student should identify t side effects of drugs. B2. The student should analyze c interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.	Anti-Parkinson's drugs	- In-person lectures - Blended learning -Laboratory experiments	- Written exams - Seminars and discus ion
8	**Mid-term exam**				
9	3+2	A1. The student should unders	Antiepileptics	- In-person lectures	- Written exams

		the mechanism of action of dru in detail. A2. The student should recogn the importance of knowing the clinical uses of drugs. B1. The student should identif the side effects of drugs. B2. The student should analyz drug interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.		- Blended learning -Laboratory experiments	- Seminars and discus ion
10	3+2	A1. The student should unders the mechanism of action of dru in detail. A2. The student should recogn the importance of knowing the clinical uses of drugs. B1. The student should identif the side effects of drugs. B2. The student should analyz drug interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.	Sedative & hypnotics drugs	- In-person lectures - Blended learning -Laboratory experiments	- Written exams - Seminars and discus ion
11	3+2	A1. The student should unders the mechanism of action of dru in detail. A2. The student should recogn the importance of knowing the clinical uses of drugs. B1. The student should identif the side effects of drugs. B2. The student should analyz drug interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.	Antihypertensive drugs	- In-person lectures - Blended learning -Laboratory experiments	- Written exams - Seminars and discus ion
12	3+2	A1. The student should unders the mechanism of action of dru in detail. A2. The student should recogn the importance of knowing the clinical uses of drugs. B1. The student should identif the side effects of drugs. B2. The student should analyz	Antianginal drugs	- In-person lectures - Blended learning -Laboratory experiments	- Written exams - Seminars and discus ion

		drug interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.			
13	3+2	A1. The student should unders the mechanism of action of dru in detail. A2. The student should recogn the importance of knowing the clinical uses of drugs. B1. The student should identif the side effects of drugs. B2. The student should analyz drug interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.	Heart failure drugs	- In-person lectures - Blended learning -Laboratory experiments	- Written exams - Seminars and discus ion
14	3+2	A1. The student should unders the mechanism of action of dru in detail. A2. The student should recogn the importance of knowing the clinical uses of drugs. B1. The student should identif the side effects of drugs. B2. The student should analyz drug interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.	Antiarrhythmic drugs	- In-person lectures - Blended learning -Laboratory experiments	- Written exams - Seminars and discus ion
15	3+2	A1. The student should unders the mechanism of action of dru in detail. A2. The student should recogn the importance of knowing the clinical uses of drugs. B1. The student should identif the side effects of drugs. B2. The student should analyz drug interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment	Drugs acting on respiratory system	- In-person lectures - Blended learning -Laboratory experiments	- Written exams - Seminars and discus ion

		regimens that are appropriate for the patient's clinical condition.			
16	3+2	A1. The student should unders the mechanism of action of dru in detail. A2. The student should recogn the importance of knowing the clinical uses of drugs. B1. The student should identif the side effects of drugs. B2. The student should analyz drug interactions between different medications. C1. The student should ut their knowledge of pharmacol including the mechanism of ac and side effects of drugs, to effective and safe treatr regimens that are appropriate the patient's clinical condition.	GIT drugs	- In-person lectures - Blended learning -Laboratory experiments	- Written exams - Seminars and discus ion

11. Course Evaluation
• 20 M Theoretical assessment; (paper-based mid-term exam + quiz + attendance) • 20 M practical assessment (attendance + quiz + practice + Homework) • 60 M paper-based theoretical final exam _____ Total 100 M

12. Learning and Teaching Resources	
Required textbooks	-Lippincott Illustrated Revie Pharmacology 6th Edition
Main references (sources)	- Basic and Clinical Pharmacology 16th Editic - Rang and Dale's Pharmacology 10th Edition -Medical Pharmacology at a Glance 9th Editio
Electronic References, Websites	• PubMed (https://pubmed.ncbi.nlm.nih.gov/) • Medscape (https://www.medscape.com/) • UpToDate (https://www.uptodate.com/) Pharmacology Education Project (https://pharmacologyeducation.org/)

Course Description Form

1. Course Name:

Public Health (Theoretical only)

2. Course Code:

Phcls25 415

3. Semester / Year:

1st Semester/4th year

4. Description Preparation Date:

01/9/2025

5. Available Attendance Forms:

Students' signature on attendance sheet

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

2 hours Theoretical (30)/ 2 units

7. Course administrator's name

Theoretical

Assist. Prof Dr. Karam Amer Aldabbagh
Email: Karam.aldabbagh@uomosul.edu.iq
Dr. Ahmed Mohammed Ibrahim
Assist. Prof Dr. Ali Saeed Alchalabi
Email: alchalabi@uomosul.edu.iq
Lec. Suhair Muaid Rasheed
Email: drahmedmias@uomosul.edu.iq

8. Course Objectives

Course Objectives:
Public health: General introduction to epidemiology followed by important communicable diseases and family health and sexually transmitted and non-communicable diseases.
Pharmacy practice: common sense knowledge of the community and hospital pharmacy ethics a practice basic information,

9. Teaching and Learning Strategies

Strategy	Lecturing Homework Quiz

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	A1: To explain the major definitions of public health terms	Concepts and principles of public health and preventive medicine	Theoretical lectures	Paper-based exams
2	2	B1: To apply the role of statistics in providing a simple data presentation to many health care staff	Public health statistics: Information health care provid	Theoretical lectures	Paper-based exams
3	2	A1: to understand gastrointestinal tract most common	Communicable diseases: Infecti	Theoretical lectures	Paper-based exams

		communicable diseases, causative pathogens, treatment, prevention	through the gas intestinal tract		
4	2	A1: To explain the major concepts in professional work as a health care provider in hospitals, and community pharmacy	Introduction pharmacy practice **Professionalism**	Theoretical lectures.	Paper-based exams
5	2	B2: to analyze skin and respiratory tract most common communicable diseases, causative pathogens, treatment, prevention	Infections throu skin and muc membranes, a respiratory tract	Theoretical lectures	Paper-based exams
6	2	A1: to understanding the major thinking and practical steps in handling health care problems	Pharmacy care plan	Theoretical lectures	Paper-based exams
7	2	A1: to explain major fundamentals required for best method of dispensing medication of most common communicable diseases, causative pathogens, treatment, prevention	Rational drug use Arthropod-borne infections	Theoretical lectures	Paper-based exams
8	**Mid-term exam**				
9	2	B1: to apply major non communicable diseases widely spread in community and contributing factors	Non-communicab disease: Health in transition	Theoretical lectures.	Paper-based exams
10	2	B1: to apply major role of community pharmacy, regulations, types of health services provided	Community pharmacy	Theoretical lectures.	Paper-based exams
11	2	B2: to analyze major role of hospital pharmacy, regulations, types of health services provided	Hospital pharmac	Theoretical lectures.	Paper-based exams

12	2	B2: to analyze major health issues caused by nutritional problems. Family role in providing best care	Nutritional disord Family health	Theoretical lectures.	Paper-based exams
13	2	A1: to understand theory of vaccines and their role in protection	Environmental health Innate and acquir Immunity; Immunization	Theoretical lectures.	Paper-based exams
14	2	B2: to analyze major considerations that should be noted before dispensing or using any medicine	Medicine safety	Theoretical lectures.	Paper-based exams
15	**Students' seminars**				

11. Course Evaluation

- 40 M Theoretical assessment;
  (paper-based mid-term exam + quiz + attendance + seminar)
- 60 M paper-based theoretical final exam

100 M total

12. Learning and Teaching Resources

Required textbooks	1. Lucas AO, Gilles HM, (Eds), Short Textbook of Public Health Medicine for the Tropic, Latest edition. 2. Boh's Pharmacy Practice Manual: A Guide to the Clinical Experience
Main references (sources)	Public Health and Epidemiology at a Glance
Electronic References, Websites	https://www.who.int/ https://www.cdc.gov/index.htm
Course update	5%

Course Description Form

1. Course Name:

Clinical pharmacy-II (Theoretical+ Practical)

2. Course Code:

Phclph25_427

3. Semester / Year:

2nd semester/2026-2025

4. Description Preparation Date:

1/9/2025

5. Available Attendance Forms:

Students' signature on attendance sheet

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

2 hours Theoretical + 2 hours Practical (60) /3 units

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

Theoretical

Name: Lec. Suhair M. Rasheed
Email: rasheedph@uomosul.edu.iq
Prof. Harith Alqazzaz
Email: al_qazaz73@uomosul.edu.iq
Assisst. Prof. Mohammed Aladul
Email: m.i.m.aladul@uomosul.edu.iq

Practical

Zahraa S. Thabit
Zahraa.mahmod@uomosul.edu.iq
Farah Ramzi Noori
farah.ramzi@uomosul.edu.iq
Hind Salim Saeed Gardaq
Hind.gardaq@uomosul.edu.iq
Rahma Saadaldain Mohammed
rahma.saadaldain@uomosul.edu.iq

8. Course Objectives

Enable the student to deal with the patient inside the hosp and give instructions about management	The course includes the basics of clinical ca of chronic diseases, how to diagnose them, give instructions about pharmacology ,n pharmacological management

9. Teaching and Learning Strategies

Strategy	Lecturing Homework Quiz, OSCE Practical laboratory demonstrations, explaining clinical cases, prescribing drugs.

10. Course Structure

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

					metho d
1	2+2	B1: Analyzes pharmacotherapy options for hypertension and links drug selection to patient comorbidities, blood pressure targets, and monitoring parameters.	hypertension	Theoretical lectures.	Paper-based exams
2	2+2	A1: Explains the principles of pharmacotherapy for ischemic heart disease, including secondary prevention goals and follow-up.	Ischemic heart dideas	Theoretical lectures. Laboratory clinical cases	Paper-based exams
3	2+2	B3: Evaluates the appropriateness, effectiveness, and safety of heart failure pharmacotherapy based on clinical status and key monitoring indicators.	Heart failure	Theoretical lectures. Laboratory clinical cases	Paper-based exams
4	2+2	A2: Identifies pharmacologic options for asthma, including stepwise therapy, indications, and key safety warnings.	asthma	Theoretical lectures. Laboratory clinical cases	Paper-based exams
5	2+2	A3: Describes pharmacologic management of meningitis, including empiric regimen selection, supportive measures, and safety monitoring.	meningitis	Theoretical lectures. Laboratory . clinical cases	Paper-based exams
6	2+2	B2: Compares pharmacologic options for chronic obstructive pulmonary disease (COPD) based on symptom control, exacerbation prevention, adverse effects, and follow-up planning.	Chronic obstructive pulmonary disease	Theoretical lectures. Laboratory clinical cases	Paper-based exams
7	2+2	A2: Identifies pharmacologic options for urinary tract infection, including indications, resistance considerations, and key safety warnings.	Urinary tract infection	Theoretical lectures. Laboratory clinical cases.	Paper-based exams

8	2+2	B3: Evaluates pharmacotherapy strategies for rheumatoid arthritis in terms of efficacy, toxicity, drug interactions, and monitoring requirements.	Rheumatoid arthritis	Theoretical lectures. Laboratory clinical cases	Paper-based exams
9	2+2	A3: Describes pharmacotherapy strategies for osteoarthritis, including analgesic selection, contraindications, and safety follow-up.	osteoarthritis	Theoretical lectures. Laboratory clinical cases	Paper-based exams
10	2+2	B1: Analyzes pharmacologic management of gout (acute and chronic) and links treatment choices to disease mechanisms and patient safety considerations.	gout	Theoretical lectures. Laboratory clinical cases	Paper-based exams
11	2+2	A1: Explains pharmacologic principles for managing anemia, including therapeutic goals and monitoring of treatment response and safety.	Anaemia	Theoretical lectures. Laboratory clinical cases	Paper-based exams
12	2+2	B2: Compares pharmacologic options for diabetes mellitus based on efficacy, hypoglycemia risk, comorbidities, drug interactions, and monitoring needs.	Diabetes melitus	Theoretical lectures. Laboratory clinical cases	Paper-based exams
13	2+2	C1: Applies principles of antimicrobial selection and dose adjustment for urinary tract infection based on patient-specific factors and available culture/susceptibility data.	Urinary tract infection	Theoretical lectures. Laboratory clinical cases.	Paper-based exams
14	2+2	C1: Applies principles of tuberculosis pharmacotherapy, including regimen components, adherence support, toxicity	T.B.	Theoretical lectures. Laboratory	

		monitoring, and key drug interactions.			
15			Final Exam		

11.Course Evaluation
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc • 20 M Theoretical assessment; (paper-based mid-term exam + quiz) • 20 M practical assessment (attendance + quiz + practice) • 60 M paper-based theoretical final exam _____ Total 100 M

12.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Pharmacotherapy handbook
Main references (sources)	Joseph T. DiPiro, Robert L. Pharmacotherapy: A Pathophysiologic Approach, 12th Edition. 2023.
Recommended books and references (scientific journals, reports...)	Pharmacotherapy principle and practice
Electronic References, Websites	
Updates percentage	5%

Course Description Form

1. Course Name

Communication Skills

2. Course Code

Phclp25 426

3. Semester / Year

2nd Semester/ 4th year 2024-2025

4. Description Preparation Date

1/9/2025

5. Available Attendance Forms:

Students' signature on attendance sheet

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

2hr./week / 2 units

7. Course administrator's name

Name: Lec. Suhair moayid rasheed
Email: rasheedph@uomosul.edu.iq
Name: Lec. Islam tarik qasim
Email: islam.tarik@uomosul.edu.iq

8. Course Objectives

Enable the student to obtain the principles of communication skills for pharmacists

9. Teaching and Learning Strategies

Lecturing
Homework
Quiz

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	**A1:** Explain the principles of patient-centered communication and their role in improving therapeutic outcomes and patient satisfaction.	Patient-Centered Communication Pharmacy Practice	Theoretical lectures.	Paper-based exams
2	2	**A1:** Describe the core elements of interpersonal communication and their application in pharmacy practice.	Principles Elements Interpersonal Communication	Theoretical lectures.	Paper-based exams
3	2	**A2:** Identify nonverbal communication cues and interpret their impact on patient understanding and professional interactions.	Nonverbal type communication	Theoretical lectures.	Paper-based exams
4	2	**B1:** Analyze common barriers to effective communication in	Barriers communication	Theoretical lectures.	Paper-based exams

		healthcare and propose strategies to overcome them.			
5	2	**B2:** Demonstrate active listening and empathic responding techniques to enhance patient trust and engagement.	Listening and empat responding dur communication	Theoretical lectures.	Paper-based exams
6	2	**B2:** Compare assertive, passive, and aggressive communication styles and apply assertive techniques in professional pharmacy settings.	Assertiveness	Theoretical lectures.	Paper-based exams
7	2	**C1:** Conduct structured patient interviews to collect accurate clinical and medication-related information.	Interviewing assessment	Theoretical lectures.	Paper-based exams
8	2	**C2:** Apply communication strategies to support patients in understanding and adhering to therapeutic regimens.	Helping patients manage therapeu regimens	Theoretical lectures.	Paper-based exams
9	2	**C3:** Perform effective patient counseling using a structured checklist and scenario-based communication techniques.	Patient counseli counseling check l point-by-point discussion; counsel scenario	Theoretical lectures.	Paper-based exams
10	2	**B3:** Evaluate the role of effective communication in preventing medication errors and enhancing patient safety.	Medication safety communication skill	Theoretical lectures.	Paper-based exams
11	2	**B2:** Adapt communication approaches to address patients' cultural, emotional, literacy, and health-related needs.	Strategies to m specific needs	Theoretical lectures.	Paper-based exams
12	2	**C2:** Apply age-appropriate communication strategies when counseling pediatric and geriatric patients about medications.	Communicating w children and elde about medications	Theoretical lectures.	Paper-based exams

13	2	**B3:** Evaluate communication practices within healthcare teams to enhance collaboration and continuity of care.	Communication sk and inter-professio collaboration	Theoretical lectures.	Paper-based exams
14	2	**A2:** Identify appropriate uses of electronic communication tools in healthcare while ensuring confidentiality and professionalism.	Electronic communication healthcare	Theoretical lectures.	Paper-based exams
15	2	**A3:** Explain ethical principles governing communication with patients, including confidentiality, informed consent, and respect.	Ethical behavior w communicating w patients	Theoretical lectures.	Paper-based exams

11. Course Evaluation

- 30 M Theoretical assessment;
  (paper-based mid-term exam + quiz + attendance)
- 70 M paper-based theoretical final exam

  _____
- 100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Robert S. B., Carole L. K., William T., Communication Skills in Pharm Practice, 5th edition,2007, Lippin Williams & Wilkins
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Bruce A. B., Communication Skills Pharmacists; American Pharmac Association; 2nd edition, 2005
Electronic References, Websites	https://youtu.be/EHNSBo3SsmY https://youtu.be/KWVoqM9jmEM

Course Description Form

1. Course Name:
General Toxicology (Theoretical+ Practical)
2. Course Code:
Phpht 24_428--
3. Semester / Year:
Second semester-2023/2024
4. Description Preparation Date:
31/1/2024
5. Available Attendance Forms:
Excel sheets
6. Number of Credit Hours (Total) / Number of Units (Total)
2hours Theoretical + 2 hours Practical (30 hour/3 units)
7. Course administrator's name (mention all, if more than one name)
Theoretical
Name: Assistant Professor Zena Sattam Hamed Email: zenasattam@uomosul.edu.iq Name: Lecturer. Dr. Mohammed Nathem Mohammed Ali Email: mohammedpharma79@uomosul.edu.iq Name : Lecturer. Dr. Sarraa Dhiaa Kasim Email: phsarraakasim82@uomosul.edu.iq Name: Lecturer. Eman Abdullah sulaiman Email: eman.sulaiman2@uomosul.edu.iq Name: Dr. Marwan M. merkhan Email: marwanmerkhan@uomosul.edu.iq
Practical
Name: Assistant Professor Zena Sattam Hamed Email: zenasattam@uomosul.edu.iq Name: Lecturer. Dr. Sarraa Dhiaa Kasim Email: phsarraakasim82@uomosul.edu.iq Name: Lecturer. Eman Abdullah sulaiman Email: eman.sulaiman2@uomosul.edu.iq Name: Assistant Lecturer .Shahad Salah Mohammed Ali Email: ph.shahad.salah@uomosul.edu.iq Name: Assistant Lecturer . Shahad Mohsin Khaleel Email: shahadmohsin@uomosul.edu.iq

8. Course Objectives	
Course Objectives	The course aims to provide students with the principles and skills required to deal with the toxicity of chemicals and drugs in clinical settings; it enables students to correlate signs and symptoms of toxicity with the analytical data, and to know how to establish preventive and therapeutic measures for poisoning cases.
9. Teaching and Learning Strategies	
Strategy	• Lectures and Interactive Presentations • Case-Based Learning • Interactive Workshops and Seminars • Self-Directed Learning and Research Projects • Assessment Strategies

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+2	A1 student to learn the nature of toxic substances A2 student to understand nature the environmental factors that lead to poisoning.	General consideration: host factor, environmental factors of toxic effects.	Lecture	Quizzes and Exams
2	2+2	B1 student write a report about the role of toxins in causing cancer B1 student differentiate between types of poisoning.	Carcinogenesis General introduction to practical toxicology	Lecture Laboratory demonstration.	Quizzes and Exams
3	2+2	A1 student to learn the damage caused by poisoning in the	Target organs and systemic toxicology: Respiratory system. Acute toxicity study,	Lecture Laboratory demonstration.	Quizzes and Exams

		respiratory system. C1: student able to calculate the toxic dose.	determination of LD50		
4	2+2	B1 student recognise the damage caused by poisoning in the urinary system and liver. C1 student able to differentiate between types of liver poisoning.	Liver, Kidney Drug toxicity on liver	Lecture Laboratory demonstration.	Quizzes and Exams
5	2+2	A1 student to learn the damage caused by poisoning to the nervous system. A2 student understand the role of nicotine in nervous system poisoning.	Nervous system Nicotine toxicity	Lecture Laboratory demonstration.	Quizzes and Exams
6	2+2	B1 student specify the damage caused by poisoning in the cardiovascular system. B2 student to differentiate the difference between types of drug poisoning.	Cardiovascular system Drug induced toxicity	Lecture Laboratory demonstration.	Quizzes and Exams
7	2+2	A1 student to learn the dangers of blood poisoning.	Blood Blood toxicity	Lecture Laboratory demonstration.	Quizzes and Exams

		B1 student shows the difference between types of blood poisoning.			
8	Mid-term exam				
9	2+2	A1 student give examples about additives in food B1 student specify the toxicity of heavy metals.	Food additive and contaminants Metal toxicity	Lecture Laboratory demonstration	Quizzes and Exams
10	2+2	C1 student able to differentiate between the types of pesticides A1 student learn about the toxicity of pesticides.	Pesticides Pesticide toxicity	Lecture Laboratory demonstration	Quizzes and Exams
11	2	B1: student shows the toxicity of metals. A1: student recognise toxic solutions.	Metals, Solvents	Lecture	Quizzes and Exams
12	2	C1 student able to differentiate the toxins produced by the environment. B1 student specify the ways to prevent environmental damage.	Environmental toxicology: Air pollution, water and soil pollutants	Lecture	Quizzes and Exams
13	2	A1 student recognise the types of toxic gases.	Gases (Tear gas, Pepper Spray)	Lecture	Quizzes and Exams

11. Course Evaluation

		B1 student distinguish between the harms caused by each toxic gas.			
14	2	A1 make the student aware of the toxic effects of cyanide and carbon monoxide. B1 student distinguish between the hazards of the two substances.	CO, Cyanide(H2S)	Lecture	Quizzes and Exams
15	2	C1 student aware the types of genetic mutations B1 student connects the role of the toxic substance in causing harm.	Mutagenesis	Lecture	Quizzes and Exams
16	Students' seminars				

Evaluation Breakdown for a Total Score of 100: • 20M Theoretical assessment ; (paper-based mid-term exam) • 20M practical assessment (attendance + quiz) • 60M paper-based theoretical final exam _____ Total 100 M

12. Learning and Teaching Resources	
Required textbooks (curricular books, if a	“ Casarett and Doull, Toxicology, the Basic Science of Poisons; Fourth edition. (2021)
Main references (sources)	“ Casarett and Doull, Toxicology, the Basic Science of Poisons; Fourth edition. (2021)
Recommended books and references (scientific journals, reports...)	Toxicological books in college library.
Electronic References, Websites	○ PubMed (https://pubmed.ncbi.nlm.nih.gov/) ○ Medscape (https://www.medscape.com/) ○ UpToDate (https://www.uptodate.com/)

Course Description Form

1. Course Name:

Industrial Pharmacy I (Theoretical+ Practical)

2. Course Code:

Phind25_429-

3. Semester / Year:

Second semester/2025-2026

4. Description Preparation Date:

15/01/2026

5. Available Attendance Forms:

Students' signature on attendance sheet

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

3 hours Theoretical + 2 hours Practical /4 units

7. Course administrator's name

Theoretical

Dr. Thamer Abduljabbar Omar
Email: thamer.omar@uomosul.edu.iq

Practical

Assist. Lecturer: Haider Fouad
Email: ph.hayderfouad89@uomosul.edu.i

Assist. Lecturer: Saad Mohammed Majeed
Email: Saad.mohammed@uomosul.edu.iq

Assist. Lecturer: Zahraa Hosain
Email: zahraa.2021@uomosul.edu.iq

Assist. Lecturer: Shahad Moyaser
Email: shmn89@uomosul.edu.iq

8. Course Objectives

Course Objectives

This course provides an introduction to the basic operations and industrial units used in the pharmaceutical industry. These operations include mixing, grinding, filtration, and sterilization. The course covers the fundamentals of each process and the equipment used. It also addresses how to manufacture and test sterile pharmaceutical products, as well as how to meet the required sterility conditions.

9. Teaching and Learning Strategies

Strategy	Lecturing Homework Quiz Practical laboratory demonstrations, oral exam and practical tests

10. Course Structure

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

1	3+1	Introduction to the pharmaceutical process Introduction in industrial pharmacy and pre-formulation	Principles of pharmaceutical processing	Theoretical lectures. Laboratory experiments	Paper-based exa
2	3+1	Principles and importance of fluid mixing in pharmaceutical manufacturing	Fluid mixing; Flow characteristics; mechanisms of mixing;mixing equipmen	Theoretical lectures. Laboratory demonstration.	Paper-based exa
3	3+1	Understanding the parameters that control solid mixing process	Solid mixing theory and particulate solid variables; forces and mechanisms	Theoretical lectures. Laboratory demonstration.	Paper-based exa
4	3+1	Introduction into milling as a main pharmaceutical unit operation	Milling; pharmaceutical application; size measurement methods; theory and energy of comminution	Theoretical lectures. Laboratory demonstration.	Paper-based exa
5	3+1	Describing the main equipment; Discussing the main parameters that control this process	Types of mills; factor influencing milling; selection of mill techniques;	Theoretical lectures. Laboratory experiments.	Paper-based exa
6	3+1	Introduction into drying as a main pharmaceutical unit operation	Drying: definition purpose Psychrometry (humidity measurement)	Theoretical lectures. Laboratory demonstration.	Paper-based exa
7	3+1	Understanding the main theory of drying; Describing the main equipment; Discussing the main parameters that control this process	theory of drying drying of solids, classification of dryer specialized drying methods	Theoretical lectures. Laboratory demonstration.	Paper-based exa
8	**Mid-term exam**				
9	3+1	Introduction into clarification as a main pharmaceutical unit operation	Clarification and filtration: Theory filter media filter aids	Theoretical lectures. Laboratory demonstration.	Paper-based exa
10	3+1	Describing the main equipment; Discussing the main parameters that control this process, addressing the essential needed tests for evaluating the filtration process.	filter selection sterile operations integrity testing equipment and systems (commercial and laborato	Theoretical lectures. Laboratory demonstration.	Paper-based exa
11	3+1	Introduction into sterilization as an important pharmaceutical unit operation	Sterilization; validation of methods; microbial death kinetics	Theoretical lectures. Laboratory demonstration.	Paper-based exa

12	3+1	Investigating the different sterilization methods	methods of sterilization (thermal and non-thermal) mechanisms; evaluation	Theoretical lectures. Laboratory demonstration.	Paper-based exa
13	3+1	Comprehending the main properties and requirements of sterile products	Pharmaceutical dosage forms; sterile products	Theoretical lectures. Laboratory demonstration.	Paper-based exa
14	3+1	Understanding the formulation requirements and quality control testing of sterile products	development; formulation; production; processing; quality control	Theoretical lectures. Laboratory demonstration.	Paper-based exa
15	**Course Review**				

11. Course Evaluation

- 20 M Theoretical assessment;
  (paper-based mid-term exam + quiz + attendance)
- 20 M practical assessment (attendance + quiz + practice+ reports)
- 60 M paper-based theoretical final exam

Total 100 M

12. Learning and Teaching Resources

Required textbooks	Lachman L., Liberman H. and Kanig J.; The Theory and Practice of Industrial Pharmacy; Third Edition
Main references (sources)	•Lachman L., Liberman L. and Schwartz J. Pharmaceutical Dosage Forms: Tablets; Second Edition: Volume I.
Electronic References, Websites	

Course Description Form

1. Course Name:
Pharmacology III
2. Course Code:
Phpht25-4212
3. Semester / Year:
Second semester/2025-2026
4. Description Preparation Date:
1/9/2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours Theoretical
7. Course administrator's name
Name: Assist. Prof Dr. Musab M Khalaf Email: Musabph74@uomosul.edu.iq Assist. Prof Dr. Hani M Al-Mukhtar Email: Hanialmukhtar@uomosul.edu.iq Assist. Prof. Dr. Ghayth M Abdulrazzaq Email: ghayth.abdulrazzaq@uomosul.edu.iq Assist. Prof. Dr. Mohannad Qazzaz Email: Mohannad.qazzaz@uomosul.edu.iq
8. Course Objectives

Course Objectives Basic Knowledge about the pharmacology of drugs used for various systemic diseases including, hormones, inflammation and anti-inflammatory, osteoporosis and anticancer drugs	• Providing students with theoretical knowledge about the mechanism of action of drugs and the side effects they may cause.

9. Teaching and Learning Strategies	
Strategy	Lecturing Assessment exams Homework discussion

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	A1. The student should understand the mechanism of action of drugs in detail. A2. The student should understand the importance of knowing the clinical uses of drugs.	Hormones of the pituitary gland	- In-person lectures - Blended learning	- Written exams - Seminars and discussion
2	2	A1. The student should understand the mechanism of action of drugs in detail. A2. The student should understand the importance of knowing the clinical uses of drugs.	Hormones of the thyroid gland	- In-person lectures - Blended learning	- Written exams - Seminars and discussion

		B1. The student should be aware of the side effects of drugs.			
3	2	A1. The student should understand th mechanism of action of drugs in detai A2. The student should recognize the importance of knowing the clinical us of drugs. B1. The student should identify the si effects of drugs. B2. The student should analyze drug interactions between different medications. C1. The student should utilize their knowledge of pharmacology, includir the mechanism of action and side effe of drugs, to plan effective and safe treatment regimens that are appropria for the patient's clinical condition.	Estrogens and antagonists	- In-person lectures - Blended learning	- Written exams - Seminars and discus ion
4	2	A1. The student should understand the mechanism of action of drugs in detail. A2. The student should recognize the importance of knowing the clinical uses of drugs. B1. The student should identify the side effects of drugs. B2. The student should analyze drug interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.	Progestins and antagonists	- In-person lectures - Blended learning	- Written exams - Seminars and discus ion
5	2	A1. The student should understand the mechanism of action of drugs in detail. A2. The student should recognize the importance of knowing the clinical uses of drugs. B1. The student should identify the side effects of drugs. B2. The student should analyze drug interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.	Contraceptives	- In-person lectures - Blended learning	- Written exams - Seminars and discus ion
6	2	A1. The student should understand the mechanism of action of drugs in detail. A2. The student should recognize the importance of knowing the clinical uses of drugs. B1. The student should identify the side effects of drugs. B2. The student should analyze drug interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action	Androgens and antagonist	- In-person lectures - Blended learning	- Written exams - Seminars and discus ion

		and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.			
7	2	A1. The student should understand th mechanism of action of drugs in detai A2. The student should recognize the importance of knowing the clinical us of drugs. B1. The student should identify the si effects of drugs. B2. The student should analyze drug interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.	Diabetes and insulin	- In-person lectures - Blended learning	- Written exams - Seminars and discus ion
	Mid-term exam				
8	2	A1. The student should understand th mechanism of action of drugs in detai A2. The student should recognize the importance of knowing the clinical us of drugs. B1. The student should identify the si effects of drugs. B2. The student should analyze drug interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.	Oral antidiabetic drugs	- In-person lectures - Blended learning	- Written exams - Seminars and discus ion
9	2	A1. The student should understand th mechanism of action of drugs in detai A2. The student should recognize the importance of knowing the clinical us of drugs. B1. The student should identify the si effects of drugs. B2. The student should analyze drug interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.	Drugs for osteoporosis	- In-person lectures - Blended learning	- Written exams - Seminars and discus ion
10	2	A1. The student should understand the mechanism of action of drugs in detail. A2. The student should recognize the importance of knowing the clinical uses of drugs. B1. The student should identify the side effects of drugs. B2. The student should analyze drug interactions between different medications. C1. The student should utilize their	Inflammation and anti-inflammatory drugs	- In-person lectures - Blended learning	- Written exams - Seminars and discus ion

		knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.			
11	2	A1. The student should understand the mechanism of action of drugs in detail. A2. The student should recognize the importance of knowing the clinical uses of drugs. B1. The student should identify the side effects of drugs. B2. The student should analyze drug interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.	Immunosuppressants and biological agents	- In-person lectures - Blended learning	- Written exams - Seminars and discussion
12	2	A1. The student should understand mechanism of action of drugs in detai A2. The student should recognize importance of knowing the clinical of drugs. B1. The student should identify the effects of drugs. B2. The student should analyze interactions between diffe medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.	Drugs for gout	- In-person lectures - Blended learning	- Written exams - Seminars and discussion
13	2	A1. The student should understand the mechanism of action of drugs in detail. A2. The student should recognize the importance of knowing the clinical uses of drugs. B1. The student should identify the side effects of drugs. B2. The student should analyze drug interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.	Anticancer drugs	- In-person lectures - Blended learning	- Written exams - Seminars and discussion
14	2	A1. The student should understand the mechanism of action of drugs in detail. A2. The student should recognize the importance of knowing the clinical uses of drugs. B1. The student should identify the side effects of drugs. B2. The student should analyze	Anticancer drugs	- In-person lectures - Blended learning	- Written exams - Seminars and discussion

		drug interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.			
15		A1. The student should understand the mechanism of action of drugs in detail. A2. The student should recognize the importance of knowing the clinical uses of drugs. B1. The student should identify the side effects of drugs. B2. The student should analyze drug interactions between different medications. C1. The student should utilize their knowledge of pharmacology, including the mechanism of action and side effects of drugs, to plan effective and safe treatment regimens that are appropriate for the patient's clinical condition.	Anticancer drugs	- In-person lectures - Blended learning	- Written exams - Seminars and discussion

11. Course Evaluation

- 30 M Theoretical assessment;
  (paper-based mid-term exam + quiz + attendance)
- 70 M paper-based theoretical final exam

Total 100 M

12. Learning and Teaching Resources

Required textbooks	**Lippincott's Illustrated Review**
Main references (sources)	**Katzung Pharmacology** **Rang and Dale's Pharmacology** **Medical Pharmacology at a Glance**
Electronic References, Websites	• PubMed (https://pubmed.ncbi.nlm.nih.gov/) • Medscape (https://www.medscape.com/) • UpToDate (https://www.uptodate.com/) Pharmacology Education Project (https://pharmacologyeducation.org/)

Course Description Form

1. Course Name:
Applied Therapeutics I
2. Course Code:
Phclp25 511
3. Semester / Year:
5th Semester / Fifth Year
4. Description Preparation Date:
1/9/2025
5. Available Attendance Forms:
List of students' names signed by students
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours per week theoretical (45)/3 units
7. Course administrator's name
Theoretical
Name: Lec. Islam Tarik E-mail: isalm.tarik@uomosul.edu.iq Name: Lec. Raghad Othman Ahmed E-mail: raghad_aldabbagh@uomosul.edu.iq Name: Lec. Luma. M. Saadallah E-mail: l.m.saadallah@uomosul.edu.iq
Practical
Name: Email:
8. Course Objectives
Course Objectives By the end of this course, the student is expected to be able to: 1. Explain the basic principles in the treatment of diseases that require hospitalization. 2. Analyze the results of laboratory tests and link them to the clinical case. 3. Apply the therapeutic principles to choose the appropriate drug treatment. 4. Assess the response to treatment and adjust the treatment plan as needed. 5. Supporting treatment decisions with modern scientific evidence and treatment recommendatio
9. Teaching and Learning Strategies

Strategy	- Interactive Lectures - Clinical Case Studies - Group discussions - Student presentations

10. Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	3	B1: Analyzes laboratory test results and links them to the clinical case to guide pharmacotherapy decisions.	Interpretation of lab results	Lectures + Discussions	+ Instant Ex Case Resolution
2	3	B3: Evaluates the pharmacotherapy plan for acute coronary	Acute coronary syndrome	Case Study + Presentation	Duty + Offer

		syndrome in terms of efficacy, bleeding risk, and monitoring indicators.			
3	3	B2: Compares antiarrhythmic and anticoagulant therapies in cardiac arrhythmias based on efficacy, safety, and drug interactions.	Arrhythmias	Lectures + Clinical Cases	+ Quart Analytical
4	3	A1: Explains the pharmacologic principles for thrombosis prevention and treatment, including anticoagulant selection and monitoring.	Thrombosis	Lecture + Video Tutorial	+ Case Solu Test
5	3	A3: Describes pharmacologic strategies for dyslipidemia and stroke, including indications for therapy, follow-up, and safety considerations.	Dyslipidemia & Stroke	Case Studies	Quarterly + Rep
6	3	A2: Identifies pharmacotherapy options for shock and key parameters for safe use and monitoring.	Shock	Interactive Lecture	Case Analysis
7	3	B1: Analyzes pharmacologic management of liver cirrhosis complications and hepatitis, and justifies selection based on risks and monitoring.	Liver cirrhosis & Hepatitis	Presentations + Discussion	Quiz + F Assessment
8	3	A3: Describes lines of pharmacotherapy for inflammatory bowel disease according to disease severity, treatment goals, and follow-up.	Inflammatory bowel diseas	Lecture + Report	Homework + Cl
9	3	B1: Analyzes the causes of acute renal failure and pharmacotherapy options based on renal function and laboratory data.	Acute renal failure	Clinical Video + Analysis	Quiz + Case Stu
10	3	B3: Evaluates the appropriateness of the medication plan for chronic renal failure	Chronic renal failure & Dialysis	Case Discussion	Demo + Quiz

		patients on dialysis, considering dose adjustment, dialysis clearance, and safety indicators.			
11	3	A3: Describes pharmacotherapy lines for systemic lupus erythematosus according to severity of organ involvement and treatment goals.	SLE	Lecture	+ Anal Quarterly
12	3	A2: Identifies essential pharmacologic options for benign prostatic hyperplasia and key considerations in managing acid–base disturbances.	BPH & Acid-base disorder	Case Study	View + Report
13	3	A2: Identifies pharmacologic options for glaucoma, including indications, contraindications, and key safety warnings.	Glaucoma	Explainer Video + Analysis	Homework + Cl
14	3	C1: Applies principles of selecting and monitoring parenteral and enteral nutrition regimens based on patient needs and safety parameters.	Parenteral & Enteral nutriti	Report + Discussion	Homework + Cl
15					

11. Course Evaluation

- Mid- Term Exam= 30%
- Final Exam= 70%

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100 M total

12. Learning and Teaching Resources

Required textbooks	Chisholm-Burns MA, Schwinghammer TL, Malone PM, et al. Pharmacotherapy principle and practice. 6th edition. 2022 Clinical pharmacy and therapeutics
Main references (sources)	Joseph T. DiPiro, Robert L. Pharmacothera Handbook. 12th Edition. 2023. Hemstreet BA. Inflammatory Bowel Disea In: DiPiro JT, Yee GC, Posey L, Haines Nolin TD, Ellingrod V, editor. Pharmacothera A Pathophysiologic Approach. 12th Edition New York: McGraw-Hill; 2023.
Electronic References, Websites	YouTube
Curriculum development	5%

Course Description Form

Course Name:
Clinical Chemistry
Course Code:
PhcIs25-512
Semester / Year:
First semester/2025-2026
Description Preparation Date:
1.9.2025
Available Attendance Forms:
Theoretical Lectures/Practical Laboratory
Number of Credit Hours (Total) / Number of Units (Total)
(2+3)total 75/4
Course administrator's name (mention all, if more than one name)
Name: Assistant Prof. Mohammed Khalid Al-Nori,Email: alnorik@uomosul.edu.iq Assistant Prof. Muther Nazar, Email: muthear78@uomosul.edu.iq Dr. Manal A. Ibrahim, Email: alfarhamanal@uomosul.edu.iq Dr.Hiba Hatim, Email: hiba.radwan@uomosul.edu.iq Dr. Suhair Mouaed, rasheedph@uomosul.edu.iq Dr. Inas Hazim. Email: enashazem@uomsul.edu.iq
Course Objectives

1-Understanding of human body chemistry in both healthy and diseased states, enabling to diagnose, monitor, and manage disease through laboratory data analysis 2-Interpreting the results of biochemistry analyses that augment the clinical examination to achieve definite diagnosis of the disease 3-Evaluating data accuracy, and applying this knowledge to therapeutic decision-making and patient care	**1-** Interpreting the results of biochemistry analyses that augment the clinical examination to achieve definite diagnosis of the disease **2-** Learning Technical skills in clinical laboratories : Collection and handling of different specimens

Teaching and Learning Strategies	
Strategy Lecturing Seminars Homework Quiz	

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 theory	**1A.** The student identifies the most important disorders related to	Disorders of Carbohydrates metabolism, Hyperglycemia &	Theoretical lectures	Paper-based exams

		carbohydrate metabolism **2B.** The student analyzes the disorders of carbohydrate metabolism	Diabetes mellitus, Hypoglycemia		
1	3practical	**2A.** The student explains the types of sampling that are required for biochemical investigations	Preparation of patient, Handling of sample	laboratory work	Paper-based exams
2	2 theory	**1C.** The student appreciates the disorders of lipid metabolism and its biochemistry	Disorders of lipid metabolism	Theoretical lectures	Paper-based exams
2	3 practical	**3A.** The student identifies the concentrations of glucose, especially diabetes mellitus	Determination of serum glucose	laboratory work	Paper-based exams Performance assessment
3	2 theory	**3B.** The student analyzes the biochemical changes in renal disorders	Kidney Function Tests	Theoretical lectures	Paper-based exams
3	3 practical	**B4**. Understanding the physiological basis of OGTT **A4**. know the indications and clinical significance	oral glucose tolerance test	laboratory work	Paper-based exams
4	2 theory	**5A.** The student distinguishes the most important changes in biochemistry during liver diseases	liver Function Tests	Theoretical lectures	Paper-based exams
4	3 practical	**A6**-know the clinical indications for the test **C2**-perform the assay correctly	Serum urea determination	laboratory work	Paper-based exams Performance assessment
5	2 theory	**A7**-Understanding the clinical	Diagnostic enzymology	Theoretical lectures	Paper-based exams

		significance of enzymes **D1**-Interpret enzyme test result in clinical conditions **C3**-Apply diagnostic enzymology in patient evaluation			
5	3 practical	**B5**-Understanding the physiological and biochemical basis of creatinine **C4**-perform the test accurately using laboratory technique	Creatinine determination	laboratory work	Paper-based exams Performance assessment
6	2 theory	**A8**-Explain hormone synthesis secretion and regulation **C5**-Appreciate the physiological action of each hormone	Hypothalamus & pituitary endocrinology, adrenal glands	Theoretical lectures	Paper-based exams
6	3 practical	**B6**-Recognize the clinical importance of measuring triglycerides **C6**-Perform the laboratory procedure accurately	Serum triglyceride	laboratory work	Paper-based exams Performance assessment
7	2 theory	**D2**-Interpret laboratory results and clinical signs **C7**-Apply knowledge to clinical problem – solving	Hypothalamus & pituitary endocrinology, adrenal glands	Theoretical lectures	Paper-based exams
7	3 practical	**B7**-Recognize the clinical significance of cholesterol testing **B8**-Understand the analytical principles of cholesterol and HDL assays	Total cholesterol HDL-c determination	laboratory work	Paper-based exams Performance assessment

		C8-Perform the procedures accurately			
8		Mid term exam			
9	2 theory	**A9**-Identify hormonal regulation and feedback mechanisms **B9**-Recognized reproductive disorders in males and females	Reproductive system, disorders of gonadal function in males & females.	Theoretical lectures	Paper-based exams
9	3 practical	**B10**-Recognize the clinical importance of AST **C9**-Perform the laboratory procedure accurately	AST estimation	Laboratory work	Paper-based exams
10	2 theory	**D3**-Interpret laboratory finding **F1**-Develop critical thinking and reasoning	Reproductive system, disorders of gonadal function in males & females.	Theoretical lectures	Paper-based exams
10	3practical	**B11**-Recognize the clinical importance of ALT **C10**-Perform the laboratory procedures accurately	ALT estimation	Laboratory work	Paper-based exams
11	2 theory	**A10**-Identify common thyroid disorders and their lab patterns **C11**.Apply critical thinking and reasoning	Thyroid function tests	Theoretical lectures	Paper-based exams
11	3 practical	**B12**-Recognize the clinical significance of ALP measurement **C12**-Perform the laboratory procedure accurately **D4**-Interpret ALP results clinically	ALP estimation	laboratory work	Paper-based exams

12	2 theory	**B13**-Understand the clinical significance **A11**-Learn strategies to minimize or account for interference	Drug interaction with laboratory Tests	Theoretical lectures	Paper-based exams
12	3 practical	**B14**-Recognize the clinical significance of estimation **A12**-Learning the analytical principles of ACP assay **D5**-Interpret ACP results clinically	Estimation of acid phosphatase	laboratory work	Paper-based exams Performance assessment
13	2 theory	**A13**-Learn the causes and pathophysiology of hypercalcemia and hypocalcemia **B15**-Understand the role of calcium in disease	Disorders of calcium metabolism	Theoretical lectures	Paper-based exams
13	3 practical	**A14**-Learn the analytical principles of bilirubin assays **C13**-Perform the laboratory procedure accurately	Bilirubin estimation	laboratory work	Paper-based exams
14	2 theory	**B16**-Recognize the clinical significance of tumour markers **A15**-Identify common tumour markers and their associated cancer **D5**-Interpret tumour marker results clinically	Tumor markers	Theoretical lectures	Paper-based exams
14	3 practical	**A15**-Learn the analytical principle of total protein assay **C14**-Perform the laboratory procedure accurately	Total protein	laboratory work	Paper-based exams

		D6-Interpret total protein results clinically			
15	2 theory	**A16**-Learn the basic concept of inborn errors of metabolism **C15**-Appreciate the clinical significance and management	Inborn errors of metabolism	Theoretical lectures	Paper-based exams
15	3 practical	**B17**-Recognize the clinical significance of albumin measurement and understand the analytical principles of albumin assays **C16**-Perform the laboratory procedures accurately	Plasma albumin	laboratory work	Paper-based exams Performance assessment

Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	-Clinical Biochemistry and Metabolic Medicine . Eighth edition. Martin-crook -Tietz Clinical chemistry and Molecular Diagnostics 6th edition; 2018 -Kaplan, Clinical Chemistry, 5th edition
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	Different scientific websites

Course Description Form

1. Course Name:
Clinical Laboratory Training
2. Course Code:
Phcls25-513-
3. Semester / Year:
1st semester/5th year
4. Description Preparation Date:
1/9/2025
5. Available Attendance Forms:
Sheets signed by students
6. Number of Credit Hours (Total) / Number of Units (Total)
4 hours Practical/ 2 unites
7. Course administrator's name
Name: Assis. Prof. Dr. Farah Hazem Omer Email: farahomer@uomosul.edu.iq Name: Lec. Dr. Ahmed Mohammed Ebrahem Email: drahmedmias@uomosul.edu.iq Name Esraaa mohammed Email: esraaadil@ uomosul.edu.iq Name Heba radyaan Email : heba.attash@uomosul.edu.iq Name: Assis. Prof. Dr. Jehan Abdul Wahab Email: dr.jehan.biochem@uomosul.edu.iq Name: Assis. Prof. Dr. Mohammed Khalid Email alnorimkj@uomosul.edu.iq Name: Assis. Prof. Dr. Karam Amer Abdul Azez Email karam.aldabbagh@uomosul.edu.iq Name: Assis. Prof. Dr. Muthear Nazar Dawood Email muthear78@uomosul.edu.iq Name: Assis. Prof. Dr. Zahraa Amer Hashem Email hashimz@uomosul.edu.iq Name: Assistant Prof. Maymona Kasem Yahya Email pharm.maymona@uomosul.edu.iq Name: Assis. Lec. Omer Bassam Salih Email omeragha@uomosul.edu.iq
8. Course Objectives

Course Objectives	Learning students about various Tests applied in hospital labs (Biochemical, Hematological, Bacteriological, Virological, General urine exam, general stool exam). Showing them the normal values of each studied parameter, and teach them how to explain abnormalities in association with clinical symptoms and diseases.

9. Teaching and Learning Strategies	
Strategy	Explain work principles+ Applying the lab examinations + making weekly reports + written and practical quiz+ Visiting specific laboratories in general hospitals to take a look on status situation in lab work field.

10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1: to understand the importance of laboratory tests, how to make sampling	Diagnostic test basis, collecting and transporting specimen.	Practical	Exam & report
2	4	A1: To understand glucose situation in the body	Biochemical test: fasting blood glucose, Post prandial glucose, oral glucose tolerance test.	practical	Exam & report
3	4	B2: to analyze kidney function	Blood urea, blood creatinine, creatinine clearance, uric acid.	practical	Exam & report
4	4	B2: To analyze blood lipids situation	Cholesterol, lipoprotein, triglycerides.	practical	Exam & report
5	4	A1: to understand Liver function	Blood proteins, bilirubin.	practical	Exam & report
6	4	B1: to apply Testing blood minerals	Calcium, inorganic phosphate, serum chloride.	practical	Exam & report
7	4	B2: Analysis of protein metabolism	Alkaline phosphatase, acid phosphatase, alanine aminotransferase, aspartate amino transferase, lactate dehydrogenase, creatinine phosphokinase.	practical	Exam & report
8	4	A1: to understand Virology test	Serological tests: VDRL, ASO-titer, hepatitis test.	practical	Exam & report
9	4	A1: to understand Serological tests for infections	C-reactive protein test, Rheumatic factor test, rosbengal test, typhoid fever test (Widal test), Pregnancy test, TORCH test.	practical	Exam & report
10	4	B2: to analyze Urinalysis	General urine exam, urine specimen collection.	practical	Exam & report
11	4	B2: To analyze Stool analysis	General stool exam, stool specimen collection	practical	Exam & report
12	4	A1: To understand Blood analysis	Hematological tests: RBC count, Hb, PCV, RBC indices, WBC count, Platelet count.	practical	Exam & report

13	4	B1: To apply Blood analysis	Blood typing, COMB test, Bleeding time, ESR.	Practical	Exam & report
14	4	A1: to understa Bacteriological and sensitivity test	Microbiological tests: culture and sensitivity test, staining methods, enriched media. VITEK II system	practical	Exam & report
15	4	B1: Applications of Clinical Microbiology	Identifying the most prevalent lab techniques that can be used in diagnostic microbiology and correlate that with the most clinical prevalent infections	practical	Exam & report

11. Course Evaluation

- 40 M Quest Practical: (10% Class activity and reports + 5% Oral exam. + 15% practical exam %10+written exam)
- 60 M final exam

- 100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Oxford handbook of Clinical and Laboratory investigation. By: Drew Provan, 4th ed. 2018.
Main references (sources)	Manual for laboratory training adopted by the department
Recommended books and references (scientific journals, reports...)	Laboratory tests in general practice. K reports 59 C. By: Gillet Pierr, et al 2007
Web sites	https://labtestsonline.org.uk
Curriculum development	5% (Microbiology and Serology)

Course Description Form

1. Course Name:
Clinical Toxicology (Theoretical+ Practical)
2. Course Code:
Phpht 25_514--
3. Semester / Year:
First semester-2025/2026
4. Description Preparation Date:
01/09/2025
5. Available Attendance Forms:
Excel sheets
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours Theoretical + 1 hours Practical (36 hour/3 units)
7. Course administrator's name (mention all, if more than one name)
Theoretical
Name: Asst. Prof. Dr. Ammar A. Younis Email: ammara@uomosul.edu.iq Name: Asst. Prof. Dr. Zena Sattam Hamed Email: zenasattam@uomosul.edu.iq Name: Lecturer. Dr. Mohammed Nathem Mohammed Ali Email: mohammedpharma79@uomosul.edu.iq Name: Lecturer. Dr. Sarraa Dhiaa Kasim Email: phsarraakasim82@uomosul.edu.iq Name: Lecturer. Eman Abdullah sulaiman Email: eman.sulaiman2@uomosul.edu.iq Name: Dr. Marwan M. merkhan Email: marwanmerkhan@uomosul.edu.iq
Practical
Name: Assistant Professor Dr. Fawaz A. Alassaf Email: Fawaz.Alassaf@uomosul.edu.iq Name: Assistant Professor Zena Sattam Hamed Email: zenasattam@uomosul.edu.iq Name: Lecturer. Dr. Sarraa Dhiaa Kasim Email: phsarraakasim82@uomosul.edu.iq Name: Lecturer. Eman Abdullah sulaiman Email: eman.sulaiman2@uomosul.edu.iq

Name: Assistant Lecturer .Shahad Salah Mohammed Ali
Email: ph.shahad.salah@uomosul.edu.iq
Name: Assistant Lecturer. Shahad Mohsin Khaleel
Email: shahadmohsin@uomosul.edu.iq

8. Course Objectives

Course Objectives	• Preparing the student to understand the basic principles of initial assessment and emergency management procedures for patients with acute poisoning, with a focus on supporting vital functions and preventing toxin absorption. • Introducing the student to common toxins in over-the-counter drugs such as caffeine, theophylline, antihistamines and decongestants, non-steroidal anti-inflammatory drugs (NSAIDs), paracetamol, and salicylates, including their mechanisms of toxicity and therapeutic management. • Familiarizing the student with toxicity resulting from prescription medications such as cardiac drugs, antidiabetic agents, and drugs affecting the central nervous system. • Understanding the effects of stimulant and narcotic substances such as opioids, cocaine, phencyclidine (PCP), marijuana, and lysergic acid (LSD), with discussion of their therapeutic and addictive aspects. • Highlighting chemical and environmental toxins such as hydrocarbons, household poisons (disinfectants, antiseptics, camphor, moth repellents), along with their mechanisms of toxicity, prevention, and intervention. • Clarifying the risks of toxic herbal and plant preparations, as well as poisonous plants and toxic mushrooms, with study of related clinical cases.

9. Teaching and Learning Strategies

Strategy	• Lectures and Interactive Presentations • Case-Based Learning • Interactive Workshops and Seminars • Self-Directed Learning and Research Projects • Assessment Strategies

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2	**A1**: To explain the steps of initial assessment (Airway, Breathing, Circulation) for the poisoned patient. **B1**: To analyze clinical information and initial investigations in order to determine the severity of poisoning.	Initial evaluation and management of the poisoned patient.	• Interactive lectures • Dialogue and discussion • Self-learning	Quizzes and Exams
2	2+1	**A1**: To explain the pharmacological properties of caffeine and theophylline and their mechanisms of action on the nervous system and the heart. **A2**: To describe the pharmacological effects of antihistamines and decongestants. **B1**: To differentiate between the clinical manifestations of caffeine/theophylline poisoning and antihistamine/decongestant poisoning. **A1**: To explain the basic principles of laboratory investigations in toxicology.	Over the counter: caffeine, theophylline; Antihistamine and decongestant Laboratory principles or toxicological screening	• Interactive lectures • Dialogue and discussion • Self-learning Laboratory demonstration.	Quizzes and Exams
3	2+1	**A1**: To explain the pathophysiological mechanism of paracetamol toxicity. **A2**: To list the clinical signs of salicylate poisoning. **A1**: To describe the role of laboratory investigations. **B1**: To compare the manifestations of paracetamol poisoning	Acetaminophen, Salicylates Cases on Acetaminophen; Salicylates, evaluation of urine salicylates.	• Interactive lectures • Dialogue and discussion • Self-learning Laboratory demonstration.	Quizzes and Exams

		with those of salicylate poisoning.			
4	2+1	**A1**: To explain the mechanism of action of non-steroidal anti-inflammatory drugs (NSAIDs) and their effects on prostaglandins. **A2**: To describe the toxicity of fat-soluble vitamins versus water-soluble vitamins. **B1**: To analyze the clinical and laboratory findings of NSAID poisoning, such as anemia and renal failure. **B1**: To correlate urinary analysis results with the clinical manifestations of toxic cases.	Non-steroidal anti-inflammatory drugs, Vitamins Urine analysis of toxins and chemicals	• Interactive lectures • Dialogue and discussion • Self-learning Laboratory demonstration.	Quizzes and Exams
5	2+1	**A1**: To explain the mechanism of toxicity resulting from beta-blocker overdose. **A2**: To list the clinical signs and symptoms of beta-blocker poisoning. **B1**: To analyze the clinical and laboratory findings in poisoning cases. **C1**: To participate in discussing a treatment plan for real or simulated clinical cases.	Toxicity of prescription medications: Cardiovascular drugs; Beta blockers Cardiac glycosides toxicity: Digitalis	• Interactive lectures • Dialogue and discussion • Self-learning Laboratory demonstration.	Quizzes and Exams
6	2+1	**A1**: To explain the mechanism of toxicity for each category. **B1**: To analyze electrocardiograms (ECGs) and laboratory findings. **B1**: To analyze clinical cases related to the ingestion of toxic foods or supplements.	Calcium channel blocker, ACE inhibitors Cases on toxicity with foods and dietary supplements	• Interactive lectures • Dialogue and discussion • Self-learning Laboratory demonstration.	Quizzes and Exams

7	2+1	**A1**: To explain the toxic effects of each class of antiarrhythmic drugs. **B1**: To analyze electrocardiograms (ECGs) to identify arrhythmias resulting from antiarrhythmic drug poisoning. **C1**: To apply therapeutic interventions in cases of antiarrhythmic drug poisoning. **B1**: To analyze laboratory reports related to toxin detection.	Antiarrhythmic agents Identification of some common poisons in biological samples.	• Interactive lectures • Dialogue and discussion • Self-learning Laboratory demonstration.	Quizzes and Exams
8	Mid-term exam				
9	2+1	**A1**: To list the clinical signs and symptoms of poisoning. **B1**: To compare the toxicity of insulin and oral antidiabetic drugs in terms of onset and duration of symptoms. **B1**: To differentiate between acute and chronic poisoning with anti-Parkinsonian drugs.	Hypoglycemic drugs Evaluation of cases of toxicity with anti-parkinsonian	• Interactive lectures • Dialogue and discussion • Self-learning Laboratory demonstration	Quizzes and Exams
10	2+1	**A1**: To explain the mechanism of toxicity of tricyclic antidepressants (TCAs) and anticholinergic phenothiazines. **B1**: To compare the manifestations of TCA and phenothiazine poisoning in terms of the severity of cardiac and neurological complications. **A1**: To explain the basic principles of assessing drug toxicity in humans.	CNS depressants; tricyclic antidepressants; anti-cholinergic phenothiazines. Evaluation of drug toxicity on human	• Interactive lectures • Dialogue and discussion • Self-learning Laboratory demonstration	Quizzes and Exams

11	2	**A1**: To explain the mechanism of action of central nervous system stimulants such as cocaine, amphetamines, and methamphetamines, and their effects on the nervous and cardiovascular systems. **A2**: To clarify the mechanisms of toxicity. **A3**: To list the clinical signs and symptoms of poisoning. **B1**: To analyze vital signs and laboratory findings associated with poisoning. **C1**: To apply emergency life-support procedures.	CNS stimulant	• Interactive lectures • Dialogue and discussion • Self-learning	Quizzes and Exams
12	2	**A1**: To explain the mechanism of action of each drug and their effects on the central nervous system and cardiovascular system. **A2**: To describe the mechanisms of toxicity for each substance. **C1**: To apply emergency interventions and supportive measures in cases of overdose or toxicity.	Drug of Abuse: Opioids; cocaine; phencyclidine; marijuana; lysergic acid	• Interactive lectures • Dialogue and discussion • Self-learning	Quizzes and Exams
13	2	**A1**: To explain the nature of common chemical and environmental toxins, and their sources at home and in industry. **B1**: To compare the toxicity of household and industrial chemicals in terms of hazard and mechanism. **C1**: To implement procedures to reduce absorption: skin washing, gastric lavage, activated charcoal.	Chemical and Environmental toxins: hydrocarbons; household toxins; antiseptic; disinfectants; camphor; moth repellents	• Interactive lectures • Dialogue and discussion • Self-learning	Quizzes and Exams

14	2	**A1**: To explain the common types of plant toxins and herbal preparations used medically and commonly in the community. **A2**: To clarify the mechanisms of toxicity of poisonous plants and toxic mushrooms, and the relationship between dose and effect. **A3**: To understand the mechanism of action of drugs in this group. **B1**: To analyze drug interactions and side effects.	Botanicals and plants- derived toxins: herbal preparation; toxic plants; poisonous mushrooms	• Interactive lectures • Dialogue and discussion • Self-learning	Quizzes and Exams
15	Students' seminars				

11. Course Evaluation	
Evaluation Breakdown for a Total Score of 100: • 20M Theoretical assessment ; (paper-based mid-term exam) • 20M practical assessment (attendance + quiz) • 60M paper-based theoretical final exam _____ Total 100 M	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if a	• Gossel TA, Bricker JD, (Eds.); Principles of Clinical Toxicology; 3th edition. (2001) • Viccellio P, (Ed.); Handbook of Medicinal Toxicology; latest edition
Main references (sources)	Goldfrank's toxicologic mergencies; Eleventh Edition
Recommended books and references (scientific journals, reports...)	Lippincott's Manual of T oxicology by Lippincott Williams and Wilkins, Wolters Kluwer. 2012
Electronic References, Websites	○ PubMed (https://pubmed.ncbi.nlm.nih.gov/) ○ Medscape (https://www.medscape.com/) ○ UpToDate (https://www.uptodate.com/)

Course Description Form

1. Course Name:
Industrial Pharmacy II (Theoretical+ Practical)
2. Course Code:
Phind25_515-
3. Semester / Year:
First semester/2025-2026
4. Description Preparation Date:
15/09/2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical /4 units
7. Course administrator's name
Theoretical
Assist. Prof. Dr. Mohanad Alfahad Email: dr.ma.alfahad@uomosul.edu.iq Dr. Thamer Abduljabbar Omar Email: thamer.omar@uomosul.edu.iq
Practical
Assist. Lecturer: Mohmmed Khalid Al-Shaheen Email: mohammed.khalid@uomosul.edu.iq Assist. Lecturer: Saad Mohammed Majeed Email: Saad.mohammed@uomosul.edu.iq Assist. Lecturer: Mais Salim Saadallah Email: drmais@uomosul.edu.iq
8. Course Objectives
Course Objectives In this course, student will be introduced to an overview of the pre-formulation studies and the drug manufacturing process. Student will review the main steps involved in making a drug product. Different types of drug products will be discussed (we will mainly focus on tablets). Subsequently, the main tools used to examine manufacturing processes and to identify important material properties, process parameters, and product attributes will be discussed.
9. Teaching and Learning Strategies

Strategy	Lecturing Homework Quiz Practical laboratory demonstrations, oral exam and practical tests

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	Understanding the basic principles and equipment involved in pre-formulation studies.	Pre-formulation Studies	Theoretical lectures.	Paper-based exams

				Laboratory demonstration	
2	3+2	Understanding the basic principles and equipment involved in pre-formulation studies.	Pre-formulation Studies	Theoretical lectures. Laboratory demonstration.	Paper-based exams
3	3+2	Exploring the benefits and drawbacks of tablets and identifying the various types of tablets.	Tablets: advantages and disadvantages, and classification	Theoretical lectures. Laboratory demonstration.	Paper-based exams
4	3+2	Students will become aware of the different kinds of pharmaceutical ingredients and their multiple uses to achieve a product performance objective.	Tablet excipients	Theoretical lectures. Laboratory demonstration.	Paper-based exams
5	3+2	Students will be familiar with the different steps and different equipment required to manufacture tablets.	Methods of Tablet Manufacturing	Theoretical lectures. Laboratory experiments.	Paper-based exams
6	3+2	Students will be familiar with the different steps and different equipment required to manufacture tablets.	Methods of Tablet Manufacturing	Theoretical lectures. Laboratory demonstration.	Paper-based exams
7	3+2	Identifying the different types of tablet coating and reviewing various coating equipment	Tablet Coating	Theoretical lectures. Laboratory demonstration.	Paper-based exams
8	**Mid-term exam**				
9	3+2	Comprehending the main tablet properties and methods used to test product properties.	In vitro Evaluation of Tablets	Theoretical lectures. Laboratory demonstration.	Paper-based exams
10	3+2	Reviewing the main tablet problems and how can we address these problems	Tablet Problems	Theoretical lectures. Laboratory demonstration.	Paper-based exams
11	3+2	Acquiring knowledge of the several categories of modified released tablets. Examining several methodologies	Modified release tablets	Theoretical lectures. Laboratory demonstration.	Paper-based exams

		for manufacturing these tablets and analyzing their release profiles.			
12	3+2	Acquiring knowledge of the several categories of modified released tablets. Examining several methodologies for manufacturing these tablets and analyzing their release profiles.	Modified release tablets	Theoretical lectures. Laboratory demonstration.	Paper-based exams
13	3+2	The student will gain knowledge regarding the microencapsulation method and its application in the field of pharmaceutical manufacturing	Microencapsulation	Theoretical lectures. Laboratory demonstration.	Paper-based exams
14	3+2	Learning about the different materials and diverse processing equipment utilized in the production of aerosol.	Aerosols	Theoretical lectures. Laboratory demonstration.	Paper-based exams
15	**Course Review**				

11. Course Evaluation

- 20 M Theoretical assessment;
  (paper-based mid-term exam + quiz + attendance)
- 20 M practical assessment (attendance + quiz + practice+ reports)
- 60 M paper-based theoretical final exam

Total 100 M

12. Learning and Teaching Resources

Required textbooks	Lachman L., Liberman H. and Kanig J.; The Theory and Practice of Industrial Pharmacy; Third Edition
Main references (sources)	• Lachman L., Liberman L. and Schwartz J. Pharmaceutical Dosage Forms: Tablets; Second Edition: Volume I. • Aulton M.; Pharmaceutics: The Science of Dosage Form Design; International Student Edition. • Ansel H., Allen L. and Jr. Popovich N.; Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems; Eighth Edition.
Electronic References, Websites	

Course Description Form

1. Course Name:
Applied Therapeutics II (Theoretical)
2. Course Code:
Phclp25 529
3. Semester / Year:
Second semester / Fifth year
4. Description Preparation Date:
1/9/2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
Two theortical hours/week – total 30 hours - 2 units total
7. Course administrator's name
Theoretical
Name: Lecturer Dr. Salah Mohammed Ameen Email: yousif_salah@uomosul.edu.iq Name: Lecturer Islam Tarik Kasem Email: islam.tarik@uomosul.edu.iq Name: Lecturer Zainab Mohanned Mahmood Email: zainab.alshamaa@uomosul.edu.iq
8. Course Objectives

Course Objectives	By the end of this course, the student is expected to be able to: 1. Explain the protocols and guidelines of treating diseases requir hospitalization. 2. Explain the pathophysiology of the disease in relation with the treatment 3. Apply therapeutic principles to select appropriate drug therapy in treatment 4. Evaluate response to treatment and modify the treatment plan when necessa 5. Support treatment decisions with current scientific evidence and treatm recommendations.
9. Teaching and Learning Strategies	
Strategy	1. Explain the causes of diseases affecting vital organs. 2. Interprets the results of laboratory tests used in patient evaluation. 3. Apply basic concepts in treatment and select the appropriate treatment plan based on the case data. 4. Analyzes clinical cases and compares treatment alternatives. 5. Designs a comprehensive treatment plan based on treatment guidelines. Evaluates the effectiveness and safety of

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	A2: Identifies pharmacologic options for thyroid gland disorders, including indications for use and key warnings.	Thyroid gland disorders	Theoretical lectures.	Paper-based exams
2	2	A3: Describes the pharmacologic management of adrenal gland disorders,	Adrenal gland disorders	Theoretical lectures.	Paper-based exams

		emphasizing therapeutic goals and follow-up.			
3	2	B3: Evaluates the appropriateness, effectiveness, and safety of hormone replacement therapy based on indication, contraindications, and monitoring.	Hormonal replacement thera	Theoretical lectures.	Paper-based exams
4	2	A2: Identifies pharmacologic options for menstruation-related disorders, including indications, contraindications, and key safety warnings.	Menstruation related disorders	Theoretical lectures.	Paper-based exams
5	1	C1: Applies principles of selecting contraception based on patient-specific risk factors, contraindications, and counseling points.	Contraception	Theoretical lectures.	Paper-based exams
6	2	A2: Identifies essential pharmacologic options for insomnia, highlighting key dependence-related warnings and monitoring needs.	Insomnia	Theoretical lectures.	Paper-based exams
7	2	B2: Compares antipsychotic medications in terms of efficacy, adverse effects, and monitoring requirements to select the most appropriate option.	Schizophrenia	Theoretical lectures.	Paper-based exams
8	2	A2: Identifies essential pharmacologic options for generalized anxiety disorder, emphasizing key safety warnings, dependence risk, and follow-up.	Generalized anxiety disorders	Theoretical lectures.	Paper-based exams
9	1	B3: Evaluates the effectiveness and safety of pharmacologic treatments for Alzheimer disease according to disease severity and functional goals.	Alzheimer disease	Theoretical lectures.	Paper-based exams

10	2	B2: Compares pharmacologic options for depressive disorders based on efficacy, adverse effects, drug interactions, and follow-up planning.	Depressive disorders	Theoretical lectures.	Paper-based exams
11	2	A1: Explains the principles of cancer chemotherapy, including treatment goals, regimen selection basics, supportive care, and safety monitoring.	Cancer chemotherapy and treatment	Theoretical lectures.	Paper-based exams
12	2	C2: Selects pharmacotherapy for breast cancer based on tumor subtype, stage, supportive treatment, and a toxicity monitoring plan.	Breast cancer	Theoretical lectures.	Paper-based exams
13	2	A3: Describes major pharmacotherapy strategies for leukemia and lymphoma, including treatment goals and key monitoring parameters.	Leukemia &Lymphoma	Theoretical lectures.	Paper-based exams
14	2	C2: Selects pharmacotherapy for prostate cancer based on stage, hormone sensitivity, and an appropriate follow-up plan.	Prostate cancer	Theoretical lectures.	Paper-based exams
15	2	B1: Analyzes adverse effects of chemotherapy and links prevention/management strategies to mechanisms and patient safety considerations.	Adverse effects of chemotherapy	Theoretical lectures.	Paper-based exams

11. Course Evaluation

- 30 M Theoretical assessment; (paper-based mid-term exam + Homework+ Attendan
- 70 M paper-based theoretical final exam

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100 M total

12. Learning and Teaching Resources

Required textbooks	1- Zeind CS, Carvalho MG, Cheng JWM, Zaiken LaPointe T, eds. Applied Therapeutics : The Clin Use of Drugs. Twelfth edition. Wolters Kluwer Hea 2024. 2- Marie Chisholm-Burns, Jill Kolesar, Patrick Mal Kelly C Lee, P. Brandon Bookstaver and Kath

	Matthias. Pharmacotherapy Principles and Prac Seventh Edition, 7th Edition. MCGraw-Hill, 2025
Main references (sources)	Joseph T. DiPiro, Robert L. Pharmacotherapy Handbook. 12th Edition. 2023
Electronic References, Websites	https://www.medscape.com/pharmacists https://www.youtube.com
Curriculum development	5%

Course Description Form

1. Course Name:
Drug Delivery System
2. Course Code:
Phind25_5210--
3. Semester / Year:
2nd Semester/5th year
4. Description Preparation Date:
01/02/2026
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours Theoretical /2 units
7. Course administrator's name
Theoretical
Name: Lec. Dr Omar Abdulhakeem Email: omar.hamid@uomosul.edu.iq Name : Lec. Dr Mohanad Alfahad ail: Dr.ma.alfahad@uomosul.edu.iq
8. Course Objectives
Develop an advanced understanding of drug delivery principles across multiple administration routes, including nasal, ocular, transdermal, pulmonary, and nanotechnology-based systems. Critically evaluate the relationship between physiological barriers and drug delivery performance, and apply this knowledge to optimize formulation strategies for different routes. Analyze and compare conventional and advanced drug delivery systems, including nanomedicines and targeted delivery platforms, in terms of design, efficacy, and clinical applicability. Design and assess drug delivery systems using scientific and regulatory considerations, including formulation challenges, stability, bioavailability, and patient-related factors. Integrate emerging technologies and current research trends in drug delivery, and critically appraise their potential for improving therapeutic outcomes and translational success.
9. Teaching and Learning Strategies
Strategy: Lecturing Homework Quiz
10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	• Critically evaluate the stages of new drug discovery and design, • Analyze the role of biologic	New drug development and approval process Introduction, Drug Discovery, Drug	Theoretical lectures	Paper-based exams

		characterization in drug development,	Design, Biologic Characterization		
2	2	• Assess the importance of early formulation studies • Explain and critically appraise the requirements and components of an Investigational New Drug (IND) application,	New drug developm and approval process Early Formulation Studies, Investigational New Drug Application - IND)	Theoretical lectures	Paper-based exams
3		• Differentiate between various drug approval pathways • Examine the role of the International Conference on Harmonization (ICH)	New drug developm and approval process NDA, ANDA, Supplemental Applications, ICH Guidelines)	Theoretical lectures	Paper-based exams
4	2	• Critically explain the principles and scope of pharmaceutical nanotechnology • Analyze the design, synthesis, and therapeutic performance of polymer–drug conjugates and dendrimers	Pharmaceutical Nanotechnology Nanomedicines (Introduction, Applications, Polym drug conjuga Dendrimers)	Theoretical lectures	Paper-based exams
5	2	• Compare and evaluate different nanoscale delivery systems (micelles, solid nanoparticles, liposomes, and lipid nanoparticles) • Assess the influence of physicochemical properties (particle size, surface charge, hydrophobicity) on biodistribution, cellular uptake, and therapeutic efficacy of nanomedicines.	Pharmaceutical Nanotechnology Nanomedicines (Micelles, Solid nanoparticles, Liposomes, Bilayer vesicles, Lipid nanoparticles)	Theoretical lectures	Paper-based exams

6	2	• Differentiate between microcapsules and microspheres • Critically appraise current challenges and emerging trends in nanomedicine,	Pharmaceutical Nanotechnology and Nanomedicines (Microcapsules, Microspheres, Ongoing developments)	Theoretical lectures	Paper-based exams
7	2	• Explain the principles and advantages of nasal drug delivery, including its role in local, systemic, and nose-to-brain drug targeting. • Analyze the anatomical and physiological features of the nasal cavity	Nasal drug delivery (Introduction, Anatomy and Physiology)	Theoretical lectures	Paper-based exams
8	Midterm exam				
9	2	• Evaluate the key factors influencing nasal drug delivery, • Compare and critically assess different nasal delivery systems (e.g., sprays, drops, gels, powders, and advanced systems)	Nasal Drug Delivery (Drug Delivery, Nasal Delivery Systems)	Theoretical lectures	Paper-based exams
10	2	• Explain the principles of ocular drug delivery and critically evaluate how ocular anatomy and physiology influence drug absorption, distribution, and elimination. • Analyze common ocular diseases and their pharmacological management, linking drug properties and dosage forms to therapeutic outcomes.	Ocular Drug Delivery (Introduction, Anator & Physiology, Ocular Conditions, Pharmacological Interventions)	Theoretical lectures Laboratory demonstration	Paper-based exams
11	2	• Evaluate formulation strategies for	Ocular Drug Delivery	Theoretical lectures	Paper-based exams

		ophthalmic preparations, • Critically assess barriers to ocular drug delivery and advanced targeting approaches, including posterior segment delivery, novel systems,	(Formulation, Barriers, Pharmacokinetics, Advanced Systems, Patient Factors)		
12	2	• Explain the fundamental principles of transdermal drug delivery systems (TDDS) and critically analyze the physicochemical and physiological factors influencing percutaneous absorption. • Evaluate percutaneous absorption enhancement strategies and predictive models, drug delivery.	Transdermals and Transdermal Drug Delivery Systems (Introduction, Factors Affecting Absorption, Enhancers, Models)	Theoretical lectures	Paper-based exams
13		• Assess the design features and performance of transdermal drug delivery systems, including drug selection criteria, system components, and release mechanisms, with comparison to patches and tapes. • Critically appraise the clinical applications of transdermal systems, including their advantages, limitations, patient considerations, and examples of marketed transdermal preparations.	Transdermals and Transdermal Drug Delivery Systems (Design Features, Advantages/Disadvantages, Clinical Use, Patches & Tapes)	Theoretical lectures	Paper-based exams

14		• Explain the principles of pulmonary drug delivery, including lung anatomy relevant to deposition, and evaluate the advantages and limitations of inhalation as a drug delivery route. • Analyze the factors influencing aerosol deposition in the respiratory tract,	Pulmonary Drug Delivery (Inhaled Drug Delivery, Principles of Aerosols)	Theoretical lectures	Paper-base exams
15		• Evaluate formulation strategies for therapeutic inhalation aerosols, • Critically assess methods of aerosol particle size analysis (e.g., cascade impaction, laser diffraction)	Pulmonary Drug Delivery (Formulation of Inhalation Aerosols, Aerosol Size Analysis Methods)	Theoretical lectures	Paper-base exams

11. Course Evaluation

- 30 M Theoretical assessment;
  (paper-based mid-term exam + quiz + attendance + seminar)
- 70 M paper-based theoretical final exam

100 M total

12. Learning and Teaching Resources

Required textbooks	Ansel's Pharmaceutical Dosage Forms and Drug Delivery
Main references (sources)	(Aulton's Pharmaceutics; The Design and Manufacture of Medicines; 6th edition, 2022)
Electronic resources	Youtube.com

Course Description Form

1. Course Name

Hospital training (Medicine, Paediatric, Surgery, Gynaecology) (Practical)

2. Course Code

Phclp25_513

3. Semester / Year

2st Semester\ 5th year

4. Description Preparation Date

1\9\2025

5. Available Attendance Forms:

Students' signature on attendance sheet

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

6hr.weekly (60) / 2 units

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

Name: Lec. Salah Mohammed Amin
Email: yosif_salah @uomosul.edu.iq
Name: Lec. Islam Tarik Qasim
Email: islam.tarik @uomosul.edu.iq
Name: Lec. Raghad Othman Ahmed
Email: raghad_aldabbagh@uomosul.edu.iq
Name: Lec. Luma Moayad Saadallah
Email: l.m.saadallah@uomosul.edu.iq
Name: Lec. Sadeel Shanshal
Email: sadeelshanshal@uomosul.edu.iq
Name: Ass. Lec. Farah Ramzi
Email: farah.ramzi@uomosul.edu.iq
Name: Ass. Lec. Zahraa S. Thabit
Email: zahraa.mahmod@uomosul.edu.iq
Name: Lec. Rahma Saadaldain
Email: rahma,saadaldain@uomosul.edu.iq

8. Course Objectives

By the end of this course, the student is expected to be able to:

1. Explain the basic principles of treating diseases requiring hospitalization.
2. Analyze laboratory test results and relate them to the clinical situation.
3. Apply therapeutic principles to select appropriate drug therapy.
4. Evaluate response to treatment and modify the treatment plan when necessary.
5. Support treatment decisions with current scientific evidence and treatment recommendatio

9. Learning outcomes

Explain the basic concepts of causes of diseases affecting vital organs.
Interprets the results of laboratory tests used in patient evaluation.
Apply basic concepts in treatment to select the appropriate treatment plan based on the case da
Analyzes clinical cases and treatment alternatives.
Designs a comprehensive treatment plan based on treatment guidelines.
Evaluates the effectiveness and safety of the proposed treatment plan.

10. Course Structure

Week	Hours	Learning outcomes	Unit or subject name	Teaching and	Evaluation method

				Learning strategies	
1	4 theoretical 2 practical	A1: Explains the basic principles of managing diseases requiring hospitalization.	Medicine(Ischemic Heart Disease+ Acut coronary syndrome)	Theoretical lectures+ video Practical trainir discussion	Paper-based exams
2	4 theoretical 2 practical	B1: Analyzes laboratory test results and relates them to the patient's clinical condition.	Pediatric (gastroenteritis+ jaundice)	Theoretical lectures+ video Practical trainir discussion	Paper-based exams
3	4 theoretical 2 practical	C1: Applies therapeutic principles to select appropriate drug therapy based on case data.	Gynecology (history abortion+ pre-eclampsia)	Theoretical lectures+ video Practical trainir discussion.	Paper-based exams, Quiz Home work
4	4 theoretical 2 practical	B2: Supports treatment decisions with current scientific evidence and guideline-based recommendations.	Surgery (role of pharmacist in surgica ward+ surgical antibiotic prophylaxi is + post operative analgesia)	Theoretical lectures+ video Practical trainir discussion	Paper-based exams
5	4 theoretical 2 practical	B3: Evaluates treatment response and modifies the therapeutic plan when necessary.	Medicine(acute and chronic heart failure)	Theoretical lectures+ video Practical trainir discussion	Paper-based exams + c report
6	2 theoretical 4 practical	B1: Analyzes laboratory test results and relates them to the patient's clinical condition.	Pediatric(hyperbiliru nemia+ neonatal sepsis+ hepatitis)	Theoretical lectures+ video Practical trainir discussion	Paper-based exams+ c report
7	4 theoretical 2 practical	C1: Applies therapeutic principles to select appropriate drug therapy based on case data.	Gynecology (DM in pregnancy+ hypertension in pregnancy+ prenatal period)	Theoretical lectures+ video Practical trainir discussion	Paper-based exams, Quiz Home work
8	4 theoretical 2 practical	B2: Supports treatment decisions with current scientific evidence and guideline-based recommendations.	Surgery(Wound management and diabetic foot+ Appendicitis+ DVT Cholelithiasis	Theoretical lectures+ video Practical training+ discussion	Paper-based exams+ c report
9	4 theoretical 2 practical	B3: Evaluates treatment response and modifies the therapeutic plan when necessary.	Medicine(Atrial fibrillation+ Diabetic ketoacidosis)	Theoretical lectures+ video Practical training+ discussion	Paper-based exams+ c report
10	2 theoretical 4 practical	A1: Explains the basic principles of managing diseases requiring hospitalization.	Pediatric(meningitis febrile convulsion+ pneumonia+ asthma bronchitis)	Theoretical lectures+ video Practical training+ discussion	Paper-based exams

11	4 theoretical 2 practical	B1: Analyzes laboratory test results and relates them to the patient's clinical condition.	Gynecology(obstetri hemorrhage+ toxoplasmosis+ UTI ectopic pregnancy+ thyroid disease+ anemia)	Theoretical lectures+ video Practical training+ discussion	Paper-based exams, Quiz Home work+ c report
12	2 theoretical 4 practical	C1: Applies therapeutic principles to select appropriate drug therapy based on case data.	Surgery (pre-operati care+ Parenteral flu therapy)	Theoretical lectures+ video Practical training+ discussion	Paper-based exams
13	4 theoretical 2 practical	B2: Supports treatment decisions with current scientific evidence and guideline-based recommendations.	Medicine(asthma+ COPD)	Theoretical lectures+ video Practical training+ discussion	Paper-based exams+ c report
14	4 theoretical 2 practical	B3: Evaluates treatment response and modifies the therapeutic plan when necessary.	Medicine (chronic kidney diseases+ stroke)	Theoretical lectures+ video Practical training+ discussion	Paper-based exams
15	2theoretical 4 practical	A1: Explains the basic principles of managing diseases requiring hospitalization.	Medicine (Peptic ulc	Theoretical lectures+ video Practical training+ discussion	Paper-based exams

11. Course Evaluation

- 40 M Theoretical assessment;
  (paper-based mid-term exam + quiz + case report+ homework)
- 60 M paper-based theoretical final exam

  _____
- 100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Pharmacotherapy Principles and Practice, Chisholm Burns 6ed 2022 Drugs in use case studies for pharmacists and Prescribers, Longmore, Murray; Wilkinson, Ian B; Baldwin, Andrew: Wallin, Elizabeth. Oxford Handbook of Clinical Medicine, 9th Edition. Copyright 2014 © Oxford University Press.
Main references (sources)	Manuals for Clinical Training adopted by the department. Nelson Textbook of pediatrics. 29th edition Robert C. Tasker. Oxford Handbook Paediatrics. 2nd edition.2013 Geoffrey Chamberlain. Obstetric by T Teachers. 8th edition. 2006.

Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	https://youtu.be/98JaiKH2q3E https://ssl.adam.com/graphics/multimedia/en/23513/23513.mp4 https://youtu.be/7cNOgyxIAss https://youtu.be/iw3KWezpl3o https://youtu.be/1s0LTriGXg0 https://youtu.be/IQKQ4eoKfTg https://www.youtube.com/watch?v=rTTAnK3PY4A
Updating in curriculum percentage	10%

Course Description Form

1. Course Name:
Pharmacutical Biotechnology
2. Course Code:
Phind25-5214
3. Semester / Year:
2025-2026 1st Semister
4. Description Preparation Date:
1/9/2025
5. Available Attendance Forms:
Written form
6. Number of Credit Hours (Total) / Number of Units (Total)
2
7. Course administrator's name(s)
Dr. Omer Abdulhakim Hamid
Dr. Mohanad A. Alfahad
8. Course Objectives

Course Objectives	**The education of students to increase their knowledge and expertise in the development, application, and therapeutic use of "biotech" drugs**
9. Teaching and Learning Strategies	
Strategy	The course is structured into two sections. A basic science and general features section and a various therapeutic classes of protein biologics.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Background knowledge	Molecular Biotechnology: From DNA Sequence to Therapeutic Protein	In person	Oral evaluation
2	2	Protein structure	Biophysical and Biochemical Characteristics of Therapeutic Proteins	In person	Oral evaluation
3	2	Stability of proteins	Protein Stability and Characterization	In person	Oral evaluation
4	2	Characterization of proteins	Protein Stability and Characterization	In person	Oral evaluation
5	2	Kinetics of proteins	Pharmacokinetics and Pharmacodynamics of Therapeutic Peptides and Proteins	In person	Oral evaluation
6	2	Route of Administration for proteins	Formulation of Biologics Including Biopharmaceutical Considerations	In person	Oral evaluation

7	2	Formulation requirements	Formulation of Biologics Including Biopharmaceutical Considerations	In person	Oral evaluation
8	**Mid term Exam**				
9	2	Vaccines	Vaccines	In person	Oral evaluation
10	2	Insulin	Insulin	In person	Oral evaluation
11	2	Monoclonal antibodies	Monoclonal Antibodies: From Structure to Therapeutic Application	In person	Oral evaluation
12	2	Immunogenicity of Therapeutic Proteins	Immunogenicity of Therapeutic Proteins	In person	Oral evaluation
13	2	Handling, Biotechnology Products	Dispensing Biotechnology Products: Handling, Professional Education, and Product Information	In person	Oral evaluation
14	2	Biosimilars	Regulatory Framework for Biosimilars	In person	Oral evaluation
15	2	Regulation rules	Regulatory Framework for Biosimilars	In person	Oral evaluation
	Final exam				

11. Course Evaluation
10 units for a seminar presentation prepared by each student, 20 units for the mid examination and 70 units for the final one.

12. Learning and Teaching Resources	
Required textbooks	**Pharmaceutical Biotechnology Fundamentals and Applications Daan J. A. Crommelin • Robert D. Sindelar Bernd Meibohm**
Main references (sources)	**Pharmaceutical Biotechnology Fundamentals and Applications Daan J. A. Crommelin • Robert D. Sindelar Bernd Meibohm**
Electronic References, Websites	

Course Description Form

1. Course Name:

Pharmacoeconomic (Theoretical)

2. Course Code:

Phclp25 5212

3. Semester / Year:

2nd Semester/5th year

4. Description Preparation Date:

1 /9/2025

5. Available Attendance Forms:

Students' signatures on the attendance sheet

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

2 hours Theoretical (30) /2 units

7. Course administrator's name

Name: Lec. Zainab M. Mahmood
Email zainab.alshamaa@uomosul.edu.iq
Name: Assiss. Lec. Rahma Saad Aldin
Email: rahma.saadaldain@uomosul.edu.iq

8. **Course Objectives**

Understand the basic terms of Pharmacoeconomics, how to build the model for economic feasibility studies, and how to extract statistical data from clinical studies to include them in th model for the economic feasibility study.

9. Teaching and Learning Strategies

Strategy	Lecturing Quiz

10. Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2	A1: Explains the concept of pharmacoeconomics, its basic principles, and key application areas.	Course overview and basic principles of Pharmacoeconomics	Theoretical lectures.	Paper-based exams
2	2	B1: Analyzes incremental and marginal cost concepts and interprets their implications in economic evaluations.	Incremental cost and margi cost	Theoretical lectures.	Paper-based exams
3	2	A3: Describes methods for measuring patient outcomes for use in pharmacoeconomic evaluations.	Measuring patient outcomes for use in economic evaluations	Theoretical lectures.	Paper-based exams

4	2	C1: Applies the time trade-off (TTO) method to derive utility values for use in economic analyses.	Time trade-off (TTO)	Theoretical lectures.	Paper-based exams
5	2	B2: Compares key approaches within cost-benefit analysis (CBA) and interprets results for decision-making.	Cost-benefit analysis CBA (1)	Theoretical lectures.	Paper-based exams
6	2	B3: Evaluates cost-benefit analysis (CBA) outputs considering assumptions, uncertainty, and monitoring of key parameters.	Cost-benefit analysis CBA (2)	Theoretical lectures.	Paper-based exams
7	2	A2: Identifies the willingness-to-pay (WTP) method, including its steps, uses, and key limitations.	Willingness-to-Pay Method [WTP]	Theoretical lectures.	Paper-based exams
8	2	C1: Applies core pharmacoeconomic concepts to practical exercises and calculates standard measures appropriately.	Exercises in pharmacoeconomic	Theoretical lectures.	Paper-based exams
9	2	B1: Analyzes cost analysis components across perspectives and links cost categories to study objectives.	Cost analysis	Theoretical lectures.	Paper-based exams
10	2	B3: Evaluates decision analysis using probabilities and interprets expected values to support rational choices.	Decision Analysis (Probabilities	Theoretical lectures.	Paper-based exams
11	2	A3: Describes the principles of cost-effectiveness analysis (CEA), including ICER calculation and interpretation.	Cost effectiveness analysis (1)	Theoretical lectures.	Paper-based exams
12	2	B2: Compares cost-effectiveness results across alternatives based on ICERs,	Cost effectiveness analysis (2)	Theoretical lectures.	Paper-based exams

		thresholds, and key assumptions.			
13	2	A3: Describes cost-utility analysis (CUA) and the use of QALYs and utility measures in evaluation.	Cost utility analysis (1)	Theoretical lectures.	Paper-based exams
14	2	B3: Evaluates cost-utility results considering utility estimation, uncertainty, and implications for resource allocation.	Cost utility analysis(2)	Theoretical lectures.	Paper-based exams
11. Course Evaluation					

- 30 M Theoretical assessment;
  (paper-based mid-term exam + quiz + attendance)
- 70 M paper-based theoretical final exam

  _____
  100 M total

12. Learning and Teaching Resources

Required textbooks	1. Michael F. Drummond, Mark J. Sculpher, Karl Claxton, Greg L. Stoddart, and 2. George W. Torrance. Methods for the Economic Evaluation of Health Care Programmes. Oxford University Press. 4th edition 2015. 3. Bootman JL, Townsend RJ, McGhan WF,(Eds.), 4-Principles of Pharmacoeconomics, Harvey Whitney Books Company, Cincinnati. 5-Karen L. Rascati, PhD Eckerd/Turley Centennial Professor of Health Outcomes and Pharmacy Practice University of Texas College of Pharmacy Austin, Texas.
Main References (sources)	1-J. Lyle Bootman, Raymond J. Townsend, William F. McGhan: Principles of Pharmacoeconomics, 2nd edition. 1996.Cincinnati, OH: I Whitney Books. 2-Joseph T. DiPiro, Robert L. Pharmacotherapy: A Pathophysiologic Approach, Sixth Edition. 2005
Electronic References, Websites	https://www.cdc.gov/index.htm

Course Description Form

1. Course Name:

Therapeutic Drug Monitoring (Theoretical + Practical)

2. Course Code:

Phclp25 5213

3. Semester / Year:

2nd Semester / 5th year

4. Description Preparation Date:

1/9/2025

5. Available Attendance Forms:

Students' signature on attendance sheet

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

2 hours theoretical + 2 hours practical per week / 3 units

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

Theoretical

Name: Lec. Luma Moayad Saadallah
Email: l.m.saadallah@uomosul.edu.iq
Name : Lec. Sadeel Shanshal
Email: sadeelshanshal@uomosul.edu.iq

Practical

Name: Lec. Luma Moayad Saadallah
Email: l.m.saadallah@uomosul.edu.iq
Name: Assist. Lec. Farah Ramzi Noori
Email: farah.ramzi@uomosul.edu.iq

8. Course Objectives

To study the basic principle of drug kinetics.
To study the applications of clinical pharmacokinetics equations and calculations
To study the clinical pharmacokinetics/ pharmacodynamics principle of antibiotics, cardiovascular agents and other drugs.

9. Teaching and Learning Strategies

Explain basic principles of pharmacokinetics.
Understand equation and clinical drug doses calculation.
Apply equation in drug doses calculation.
Analyze drug doses activity.
Evaluate dose activity through patient response.
Design treatment plan to the patient according to his medical condition.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+2	A1: Explains core clinical PK/PD concepts and their relevance to therapeutic dru monitoring.	Review of clinical pharmacokinetic (PK)/ pharmacodynamic (PD) Principles. (part 1)	Lecture with video	discussion
2	2+2	A3: Describes concentratio time profiles and key PK/P relationships used in dosing decisions.	Review of clinical pharmacokinetic (PK)/ pharmacodynamic (PD) principles (part 2)	Lecture	quiz

3	2+2	B1: Analyzes clinical pharmacokinetic equations interpret patient data and estimate dosing parameters	Clinical PK equations and calculations for some medications	Lecture	discussion
4	2+2	A2: Identifies major pharmacokinetic parameter (half-life, volume of distribution, clearance) and key determinants.	Pharmacokinetic paramete (half life and volume of distribution……)	Lecture	Discussion+ problem solving
5	2+2	A3: Describes bioavailabili and factors affecting drug absorption and systemic exposure.	Bioavailability	Lecture+ vi	Paper-based exam
6	2+2	B2: Compares IV bolus and IV infusion dosing using PK/PD principles and monitoring requirements.	Clinical PK/PD for IV routes	Lecture	Discussion + problem solving
7	2+2	C1: Applies clinical pharmacokinetic equations and calculations to individualize doses based o measured drug levels.	Clinical PK equations and calculations	Lecture	Paper-based exam(practic
8	2+2	B3: Evaluates dosing and monitoring considerations i special populations (e.g., renal/hepatic impairment, pediatrics, geriatrics).	Clinical PK/PD for specia populations part 1	Lecture	discussion
9	2+2	B1: Analyzes patient-speci factors in special populatio to justify monitoring plans and dose modification.	Clinical PK/PD for specia populations part 2	Lecture	Paper-based exam
10	2+2	A1: Explains therapeutic d monitoring for aminoglycosides, including target concentrations and safety monitoring.	Clinical PK equations and calculation for aminoglycoside part1	Lecture	discussion
11	2+2	C1: Applies aminoglycosid pharmacokinetic calculatio to design and adjust individualized dosing regimens.	Clinical PK equations and calculation for aminoglycoside part2	Lecture	Discussion +problem solving
12	2+2	B3: Evaluates vancomycin dosing and monitoring strategies (e.g., AUC-based monitoring) for efficacy an nephrotoxicity risk.	Clinical PK equations and calculation for vancomyci	Lecture	Discussion +problem solving
13	2+2	A2: Identifies key indicatic therapeutic ranges, toxicity features, and major interactions relevant to digoxin monitoring.	Clinical PK equations and calculation for digoxin	Lecture	discussion
14	2+2	B1: Analyzes theophylline pharmacokinetics and interacting factors to guide	Clinical PK equations and calculation for theophyllir	Lecture	discussion

		monitoring and dose adjustment.			
15	2+2	B1: Analyzes phenytoin nonlinear kinetics and serum level interpretation to determine an appropriate dose adjustment.	Clinical PK equations and calculation for phenytoin	Lecture	Paper-based exam

11. Course Evaluation
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc
● 25 M (midterm written exam) ● 15 M (written exams of practical part+ attendance) ● 60 M (final exam) ● 100 M total

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	Applied Clinical Pharmacokinetics, Second Edition, 2008 by Larry A. Bauer.
Recommended books and references (scientific journals, reports...)	Clinical Pharmacokinetics Concepts and Applications Third Edition, 1995 by Malcolm Rowland and Thom Tozer;
Electronic References, Websites	