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