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**
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•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