



Jordan University of Science and Technology
Faculty of Pharmacy
Doctor Of Pharmacy (Pharm D.) Department

PHMD332 Medicinal Natural Products - JNQF Level: 7

Second Semester 2023-2024

Course Catalog

3 Credit Hours. Provides basic information about nature as a source of drugs, different classes of natural products with an emphasis on secondary metabolites from plants and microorganisms. Also covered, are the role of natural products in drug discovery, drug discovery methods and approaches, and drug development. The use of various natural drugs in modern-day therapeutics will also be discussed.

Teaching Method: Blended

Text Book

Title	Medicinal Natural Products: A Biosynthetic Approach
Author(s)	Paul M. Dewick
Edition	3rd Edition
Short Name	Ref #1
Other Information	2009, John Wiley & Sons

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref #2	Fundamentals of Pharmacognosy and Phytotherapy	Michael Heinrich, Joanne Barnes, Simon Gibbons, Elizabeth Williamson	3rd Edition	2018, Elsevier
Ref #3	Trease and Evans Pharmacognosy	William C. Evans	16th Edition	2009

Instructor

Name	Dr. Rana Qasaymeh
Office Location	P1 L-1
Office Hours	
Email	ranaqasaymeh@just.edu.jo

Instructor

Name	Prof. Tamam El-Elimat
Office Location	P1 L1
Office Hours	
Email	telimat@just.edu.jo

Class Schedule & Room

<p>Section 1: Lecture Time: Sun, Tue : 08:30 - 09:30 Room: D4203</p> <p>Section 2: Lecture Time: Sun, Tue : 10:30 - 11:30 Room: D4203</p> <p>Section 4: Lecture Time: Mon, Wed : 13:00 - 14:00 Room: D4203</p> <p>Section 5: Lecture Time: Mon, Wed : 14:30 - 15:30 Room: M3305</p>

Prerequisites		
Line Number	Course Name	Prerequisite Type
313231	PHMD323 Medicinal Chemistry 2	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	Topic	References
Weeks 1, 2, 3	Introduction: Pharmacognosy vs. natural products chemistry. The role of natural products in drug discovery and development. Approaches to discover new drug leads from nature Methods in natural product chemistry.	Plus Handouts From Ref #2
Week 4	Primary and secondary metabolism. The building blocks	Chapter 2 From Ref #2
Weeks 5, 6	The acetate pathway: Fatty acids and polyketides. Saturated fatty acids, unsaturated fatty acids, uncommon fatty acids, prostaglandins, thromboxanes, leukotrienes. Macrolides and aromatics	Chapter 3 From Ref #1
Weeks 7, 8	The shikimate pathway: Aromatic amino acids, simple benzoic acids, and phenylpropanoids. Aromatic polyketides and terpenoid quinones	Chapter 4 From Ref #1
Weeks 9, 10, 11	The mevalonate pathway: terpenoids and steroids. Monoterpenes and sesquiterpenes. Diterpenes, triterpenes, and steroidal saponins. Cardiac glycosides, phytosterols, and tetraterpenes	Chapter 5 From Ref #1
Week 12	Peptides, proteins, and other amino acid derivatives: Peptides and proteins, peptide hormones, and modified peptides: penicillins and cephalosporins	Chapter 7 From Ref #1
Weeks 13, 14	Alkaloids: Ornithine and lysine derived, nicotinic acid-derived, phenylalanine, and tyrosine derived Tryptophan derived, histidine derived, purine derived, and terpenoid derived	Chapter 6 From Ref #1

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Demonstrate a fundamental understanding of natural products and their contribution to drug discovery. [1PLO1.1] [1L7K1]	26%	First Hour Exam, Active Learning, Final Exam
Distinguish between primary and secondary metabolites and comprehend their respective roles and significance in biological systems and applications. [1PLO1.1] [1L7K1]	11%	First Hour Exam
Develop a strong comprehension of the biosynthetic pathways and the building blocks involved in natural product formation. [1PLO1.1] [1L7K1]	8%	Second Hour Exam, Final Exam
Develop a thorough understanding of the pharmacological activities of natural products. [1PLO1.1] [1L7K1]	55%	Second Hour Exam, Active Learning, Final Exam

Relationship to Program Student Outcomes (Out of 100%)															
PLO1.1	PLO2.1	PLO2.2	PLO2.3	PLO2.4	PLO3.1	PLO3.2	PLO3.3	PLO3.4	PLO3.5	PLO3.6	PLO4.1	PLO4.2	PLO4.3	PLO4.4	PLO5.1
100															

Relationship to NQF Outcomes (Out of 100%)
L7K1
100

Evaluation	
Assessment Tool	Weight
First Hour Exam	25%
Second Hour Exam	25%
Active Learning	10%
Final Exam	40%

Policy	
Communicating with Instructors	<ul style="list-style-type: none"> - Students should communicate through their official JUST emails. Communication through personal email accounts (yahoo, Gmail, Hotmail, etc.) or social media will NOT be accepted, and no response will be provided. - Students are required to check their emails and the E-learning page of the course regularly for announcements and notifications.
Exams	<ul style="list-style-type: none"> - All exams are closed books and notes. - The final exam is comprehensive (covers all the material). - The first, second, and midterm incomplete exams need approval from the departments' heads. - The final incomplete exams need approval from the dean.
Cheating	<p>Prohibited; The commitment of the acts of cheating and deceit such as copying during examinations, altering examinations for re-grade, plagiarism of homework assignments, and in any way representing the work of others as your own is dishonest and will not be tolerated. Standard JUST policy will be applied.</p> <p>المادة 7: إذا ضبط الطالب أثناء الامتحان أو الاختبار متلبساً بالعث فتوقع عليه العقوبات التالية مجتمعة:</p> <p>أ- اعتباره راسباً في ذلك الامتحان أو الاختبار</p> <p>ب- الغاء تسجيله في بقية المساقات المسجل لها في ذلك الفصل</p> <p>ج- فصله من الجامعة لمدة فصل دراسي واحد، و هو الفصل التالي للفصل الذي ضبط فيه</p>
Attendance	<ul style="list-style-type: none"> - Attendance is mandatory and will be recorded regularly. - Excellent attendance is expected. - Students who miss more than 20% of the classes will be dropped from the course as per JUST policy. - If you miss class, it is your responsibility to find out about any announcements or assignments you may have missed.
Active learning and students' participation	<ul style="list-style-type: none"> - Students are expected to actively participate in class discussions
Withdraw	Last day to drop the course is before the twelve (12th) week of the current semester.
Classroom Etiquette	<ul style="list-style-type: none"> - Respect <ul style="list-style-type: none"> o Respect people, places, and things. o Raise your hand to speak. o Listen respectfully. o Food and drink are not permitted in class. o Do not engage in aside conversations. - Participation or Disruption: <ul style="list-style-type: none"> o Do not hesitate to ask questions at any time, especially if you are unsure of something. o Listen to other students' questions to avoid asking the same question five minutes later. o Allow your classmates to participate in class discussions and refrain from taking advantage of all opportunities for active participation. - Cell Phones and Electronic Devices: <ul style="list-style-type: none"> o Texting is not permitted in class. o The use of cell phones, smartphones, or other mobile communication devices is disruptive and is therefore prohibited during class without permission. o Your phone should be turned off. If you must keep your phone on, you should set it to vibrate or silent mode and leave class if you receive an emergency call. o Except in emergencies, those using such devices must leave the classroom for the remainder of the class period. o Do not use your laptop in class for browsing the Internet or using social media while in class. - Missing a Class <ul style="list-style-type: none"> o Do not miss classes. It is not appropriate to ask the professor if you missed anything important if you miss class. Obviously, something of importance was missed, you missed a whole class! o Whenever you are absent from class, it is your responsibility to make up the work and to get notes, not your professor's. o If you need to leave early, notify the instructor. - Be Punctual <ul style="list-style-type: none"> o Make sure you arrive to class on time.

Virtual Classroom Etiquette	<ul style="list-style-type: none"> - Be on time to class. - Be in a quiet place and comfortable space. - Mute your microphone when you are not speaking. - Turn on your video (optional). - Raise your virtual hand should you have any questions or want to contribute to class discussion. - It is the responsibility of students to secure internet connections for their online courses to avoid interruptions and inconvenience during class time.
Email Etiquette	<ul style="list-style-type: none"> - Type your email in the body of the email NOT in the subject line. - Provide a clear subject line. Keep it short and to the point, but not vague. Name, class, and what the email is specifically about should be in the subject line. - Body of the email: Your emails should always start with a formal greeting like you would in a letter, be brief (one screen length), check your spelling/grammar/punctuation, use a professional font (not decorative), and include a salutation aligned with your message (Thank you or Sincerely). - Avoid sending an email to your professor asking about grades or complaining about them. Schedule an appointment to meet in person to discuss areas for improvement if you have inquiries. - Consider the impression your tone will make in the email. It is recommended waiting 24 hours before sending an email or responding to an email if you are emotionally charged. - It is not appropriate to write in ALL CAPS. This conveys the impression that you are shouting at the recipient. - Make sure you read and reread your email before sending it. Make sure your emails are grammatically correct, have proper titles, and are properly spelled. - If you have multiple questions or the message runs long, you might consider revising the message or scheduling a face-to-face meeting. - You should double-check your ATTACHMENTS. Refer to your attachments within the body of your email. It is advisable to avoid attaching large files and to consider sending the document as a PDF. - Please allow sufficient time for a response. The sender and receiver should both allow sufficient time. As a rule of thumb, 24 work hours should be given. If sending emails after official work hours or during formal vacations, a delay in response is expected. Following that, if no response is received, you can follow up.

Date Printed: 2024-02-26