

Template 1

**Jordan University of Science and Technology**  
**Faculty/College of Pharmacy**  
**Department of Medicinal Chemistry and Pharmacognosy**  
**Second semester 2018/2019**

**Course Specifications**

Title & Instructor	
<b>Course Title</b>	Medicinal Chemistry III
<b>Course Number</b>	Pharm 421
<b>Prerequisites</b>	Medicinal Chemistry II, (Phar 322)
<b>Course Website</b>	Lecture notes, news and updates....etc. will be posted on <a href="https://elearning.just.edu.jo/">https://elearning.just.edu.jo/</a> which is the primary method by which information will be disseminated to everyone in the class. Please check it on a regular basis.
<b>Instructors</b>	Dr. Nizar Al-Shar'i and Dr. Jamal Aljilani
<b>Office Location</b>	P2 Level -1
<b>Office Phone</b>	+962 2 720 1000 Ext. 26776
<b>Office Hours</b>	To be announced soon
<b>E-mail</b>	<a href="mailto:nashari@just.edu.jo">nashari@just.edu.jo</a>
<b>Teaching Assistant</b>	NA

Course Aims and Objectives	
The <b>aim</b> of this course is to impart an understanding of the structure-activity relationships different anti-infective and antineoplastic agents, their mode of action, and principals involved in modern drug design and discovery.	
Objectives	Weights
<b>1)</b> Enable the student to understand the mode of action of the different antibiotics, antifungal, antiviral, and anticancer drugs on various targets.	<b>20 %</b>
<b>2)</b> Understand the structural modifications of a compound that alter its physicochemical properties, which may affect its biological response or influence its formulation or administration.	<b>40 %</b>
<b>3)</b> Introduce key aspects of medicinal chemistry to impart an understanding of what medicinal chemists have to think about when attempting to design new drugs.	<b>15 %</b>
<b>4)</b> Describe the principals involved in modern drug design and discovery.	<b>15 %</b>
<b>5)</b> Describe the synthesis of some important target compounds.	<b>10%</b>

Course Description
This course discusses the medicinal chemistry of antibiotics, antifungal, antiviral and anticancer agents, covering structure activity relationship, mechanism of action and other issues related to physicochemical properties of each class members.

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Program competencies	
<b>Domain 1: Foundational Knowledge</b>	
1.1	Learner (Learner): Develop, integrate, and apply knowledge from the foundational sciences (i.e. pharmaceutical, social/behavioral/administrative, and clinical sciences) to evaluate the scientific literature, explain drug action, solve therapeutic problems, and advance population health.
<b>Domain 3: Approach to Practice and Care</b>	
3.1	Problem solving (problem solver): identify problems; explore and prioritize potential strategies; and design, implement, and evaluate a viable solution.

Active Learning Strategies	
1. STBE: Structure Based Therapeutic Evaluation cases within group discussion.	
2. Problem solving formulated in exam type questions	
3. Animations and simulations	
4. Argumentative discussions between student groups	

Text Book & References	
<b>Title</b>	Foye's principles of medicinal chemistry
<b>Author(s)</b>	Thomas L. Lemke, David A. Williams
<b>Publisher</b>	Lippincott Williams & Wilkins
<b>Year</b>	2013
<b>Edition</b>	7 <sup>th</sup> Edition
<b>Book Website</b>	<a href="https://www.lww.com/Product/9781609133450">https://www.lww.com/Product/9781609133450</a>
<b>References</b>	<ol style="list-style-type: none"> <li>1. An Introduction to Medicinal Chemistry, Graham Patrick, 5th Edition, 2013, Oxford University press.</li> <li>2. Wilson and Gisvold's textbook of organic medicinal and pharmaceutical chemistry, John H. Block, John M. Beale, 12th edition, 2013, Lippincott Williams &amp; Wilkins</li> </ol>

Intended Student Learning Outcomes(ISLOs)		
Upon successful completion of this course, students should be able to:		
ISLOs	Related Objective(s)	Reference(s)
1. Memorize the mode of action of major drug classes discussed in this course	<b>1</b>	33, 35, and 38
2. Apply the knowledge gained from organic chemistry and medicinal 1-2 courses regarding functional group chemistry, pharmacodynamics, and pharmacokinetics to specific drug groups.	<b>2 and 3</b>	All chapters
3. Recognize the term Structure Activity Relationship SAR, and apply it to studied drug classes in terms of how structural modification may affect its biological response and affect its formulation or administration.	<b>2 and 3</b>	33, 35, and 38
4. Understand and appreciate the importance of rational drug design.	<b>4</b>	9 and 21 (ref 1)
5. Recall the relationship between chemical structures and pharmacodynamics pharmacokinetic of some classes of drugs.	<b>2 and 3</b>	Mainly chapter 33
6. Predict the biological response of some groups of drugs and medical use by referring to their chemical structures (applying the SBTE approach).	<b>2 and 3</b>	33 and 35
7. Predict the suitable route of administration of different drugs based on their chemical structures.	<b>2</b>	Mainly 33

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<b>Teaching &amp; Learning Methods</b>
<p>Teaching and learning methods are designed to achieve the course objectives. Those methods include:</p> <ol style="list-style-type: none"> <li>1. Lecture notes and handouts</li> <li>2. Data show and computer in lectures</li> <li>3. Demonstration videos</li> <li>4. Problem solving</li> <li>5. Group discussion</li> <li>6. Workshops</li> </ol>

<b>Assessment</b>		
<b>Assessment Type</b>	<b>Expected Due Date</b>	<b>Weight</b>
First Exam	4 <sup>th</sup> – 6 <sup>th</sup> week	30 %
Second Exam	9 <sup>th</sup> – 11 <sup>th</sup> week	30 %
Final Exam	15 <sup>th</sup> – 17 <sup>th</sup> week	40 %

<b>Useful Resources</b>
Textbook, References, Class notes, Internet, Drugbank website, Protein Data Bank, and Freely Available Visualizers such as DS and PyMol.

<b>Course Content</b>		
<b>Week</b>	<b>Topics</b>	<b>Chapter in Text/handouts</b>
1, 2	<ol style="list-style-type: none"> <li>1. Introduction to chemotherapy</li> <li>2. Sulfonamides</li> <li>3. Quinolones</li> <li>4. Nitrofurantoin &amp; Nitroimidazole</li> </ol>	33
3-6	<ol style="list-style-type: none"> <li>5. <math>\beta</math>- lactam antibiotics.</li> </ol>	33
7,8	<ol style="list-style-type: none"> <li>6. Tetracyclines.</li> <li>7. Aminoglycosides.</li> <li>8. Macrolide Antibiotics</li> </ol>	33
9	<ol style="list-style-type: none"> <li>9. Antifungal</li> </ol>	35
10	<ol style="list-style-type: none"> <li>10. Antiviral</li> </ol>	38
11-14	<ol style="list-style-type: none"> <li>11. Cancer chemotherapy</li> </ol>	9 and 21 (ref 1)

<b>Additional Notes</b>	
<b>Exams</b>	<ul style="list-style-type: none"> <li>• The format for the exams is generally (but NOT always) as follows: Multiple-choice and short essay questions.</li> <li>• Grades will not be given out via e-mail</li> <li>• All exams are closed book and notes. The final exam is comprehensive (covers all the material).</li> <li>• Instructor should return exam papers graded to students not after the week following the exam date.</li> <li>• Incomplete exams should not be given unless there is a valid excuse and they need approval from the dean.</li> <li>• Arrangements to take an exam at a time different than the one scheduled MUST be made prior to the scheduled exam time.</li> </ul>

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<b>Cheating</b>	<p>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 style="text-align: center;">المادة 7: إذا ضُبط الطالب أثناء الامتحان أو الاختبار متلبساً بالغش فتوقع عليه العقوبات التالية مجتمعة:  أ- اعتباره راسباً في ذلك الامتحان أو الاختبار.  ب- الغاء تسجيله في بقية المساقات المسجل لها في ذلك الفصل.  ج- فصله من الجامعة لمدة فصل دراسي واحد يلي الفصل الذي ضبط فيه.</p>
<b>Attendance</b>	<ul style="list-style-type: none"> <li>• Excellent attendance is expected.</li> <li>• JUST policy requires the faculty member to assign ZERO grade (35) if a student misses 10% of the classes that are not excused, and a total of 20% with approved valid excuses.</li> <li>• If you miss class, it is your responsibility to find out about any announcements or assignments you may have missed.</li> </ul>
<b>participation</b>	<ul style="list-style-type: none"> <li>• Students are expected be proactive and to be fully engaged in interactive class discussions.</li> </ul>
<b>Drop Date (withdraw)</b>	<ul style="list-style-type: none"> <li>• Last day to drop the course is before the twelve (12<sup>th</sup>) week of the current semester.</li> </ul>
<b>Workload</b>	<ul style="list-style-type: none"> <li>• Average work-load student should expect to spend is 3 hours/week</li> </ul>