Template 2

Jordan University of Science and Technology
Faculty/College of Pharmacy
Department of Medicinal Chemistry and Pharmacognosy
Second Semester 2018/2019
Course Specifications

Title & Instructor	
Course Title	Pharmaceutical organic chemistry
Course Number	PHAR222
Prerequisites	Organic Chemistry I (CHEM 217)
Instructor	Dr. Buthina Al-Oudat
Office Location	P1 Level 1 (Fourth Floor)
Office Phone	7201000 Ext. 23546
Office Hours	Sun: 10:30 – 11:30, 12:30-1:30 Tue: 10:30 – 11:30 Thu: 10:30 – 11:30 Mon: 10:00 - 11:00
E-mail	baoudat@just.edu.jo

Course Description

This course is a customized course for pharmacy students. It is designed to enrich students' knowledge in organic chemistry that should lead to a better understanding of medicinal chemistry. The course includes a general review of organic functional groups with emphasis on the physicochemical properties of biological importance such as carboxylic acid and its derivatives, amines, sulfuric acids and sulfonic acids, sulfonamides, carbonates and ureas. In addition, the course introduces students to important subjects in organic chemistry such as resonance, acidity, basicity, aromaticity and stereochemistry of organic compounds. The course also is designed to explain in details the chemical basis of drug metabolism.

Course Competencies

1.1 Learner (Learner): Develop, integrate, and apply knowledge from the foundational sciences to evaluate the scientific literature and explain drug action.

3.1 Problem Solving (Problem Solver): Identify problems; explore and prioritize potential strategies; and design, implement, and evaluate a viable solution.

Active Learning Methods

1. Pre-class sample questions on assigned lecture. The questions should encourage students to review some required basic information needed for a better understanding of the assigned lecture.
2. Engaging students in classroom discussions.
3. Focusing on problem solving.
4. Using organic chemistry molecular model set to represent organic compounds which enable students to visualize the corresponding structures and therefore better understanding of related concepts.

Course Aims and Objectives	
The **aim** of this course is to provide pharmacy students with the basic information in organic chemistry which is required for a better understanding of medicinal chemistry courses.	
Objectives	**Weights**
1) To set up the basic understanding of electron delocalization and resonance	**10%**
2) To set up the basic understanding of organic acids and bases	**10%**
3) To introduce and illustrate the definition of aromaticity and criteria for aromaticity	**10%**
4) To learn the method of naming organic compounds containing more than one functional group in their chemical structures	**5%**
5) To set up the basic understanding of stereochemistry of organic compounds	**20%**
6) To study different organic functional groups including their physical and chemical properties, reactions and syntheses with emphasis on their physicochemical properties of biological importance.	**20%**
7) To understand the chemical basis of drug metabolism	**25%**

Text Book & References	
Title	Essential Organic Chemistry
Author(s)	Paula Yurkanis Bruice
Year	2010
Edition	2nd Edition
Book Website	
References	1. Lead Optimization for Medicinal Chemists: Pharmacokinetic Properties of Functional Groups and Organic Compounds, Florencio Zaragoza Dörwald, 2012 2. Review of Organic Functional Groups: Introduction to Medicinal Organic Chemistry, Thomas L. Lemke, 3rd Edition, 1992 3. Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry, John H. Block, John M. Beale, 11th edition, 2004, Lippincott Williams & Wilkins

Intended Student Learning Outcomes(ISLOs) Upon successful completion of this course, students should be able to:		
ISLOs	**Related Objective(s)**	**Reference(s)**
To set up the basic understanding of resonance, acidity, basicity, and aromaticity.	**1,2,3**	Section I, II, III, IV/ lecture notes
To be able to name organic compounds containing multiple functional groups.	**4**	Section V/ lecture notes
To have good understanding of stereochemistry of organic compounds	**5**	Section VI/ lecture notes
To be able to recognize organic functional groups and learn their physical and chemical properties in addition to their reactions and syntheses	**6**	Section VII/ lecture notes

To understand the chemical basis of drug metabolism	**7**	Section VIII/ lecture notes

Teaching & Learning Methods
1. Class lectures and lecture notes are designed to achieve the course objectives
2. The students should read the assigned chapters before class.
3. The students are encouraged to participate in class and ask questions.
4. Organic chemistry molecular model set is used to assemble and visualize simple and complex organic molecules.

Assessment		
Assessment Type	**Expected Due Date**	**Weight**
First Exam	TBA	30%
Second Exam	TBA	30%
Final Exam	TBA	40%

Course Content		
Week	**Topics**	**Chapter in Text/handouts**
1	Introduction (Drawing and Hybridization)	Section I/ lecture notes
2-3	Electron delocalization and resonance	Section II/ lecture notes
4	Aromaticity	
5-6	Organic acids and bases	Section III/ lecture notes Section IV/ lecture notes
7-8	Stereochemistry	Section VI/ lecture notes
9-10	Organic Functional Groups	Section VII/ lecture notes
11-13	Metabolism	Section VIII/ lecture notes

Additional Notes	
Exams	All exams are closed book and notes. The final exam is comprehensive (covers all the material). Incomplete exams need approval from the **Dean of college of pharmacy** and will not be given unless there is a valid excuse.
Cheating	**Prohibited;** and in case of cheating the student will be subjected to punishment according to the standard JUST policy.
Attendance	Excellent attendance is expected. JUST policy requires the faculty member to assign ZERO grade (35) if a student misses 20% of the classes. If the student misses a class, it is his/her responsibility to find out about any announcements or assignments he/she may have missed.
Participation	Excellent participation is expected.
Withdraw	Last day to drop the course is before the twelve (12th) week of the current semester.