Detailed Course Description - Course Plan Development and Updating Procedures/ Pharmacy Department	QF02/0408-3.0E

Faculty	Pharmacy	Department	Pharmacy
Course number	201700	Course title	**Advanced Organic Chemistry**
Number of credit hours	3	Pre-requisite/co-requisite	None

Brief course description
This course is designed to address the mechanistic, theoretical and synthetic aspects of a broad range of reactions utilized in organic chemistry. Classical reactions and developed reactions will be reviewed with examples from the literature. It will explore the stereochemical features including conformation and stereoelectronic effects; reaction dynamics, isotope effects and molecular orbital theory applied to pericyclic and photochemical reactions; and special reactive intermediates including carbenes, carbanions, and free radicals.

	Course goals and learning outcomes
Goal 1	At the end of this course students will be able to:
Learning outcomes	1.1 Delineate mechanisms for reactions in organic chemistry 1.2 Apply organic reactions in multi-step synthesis 1.3 Describe principles concerning green- and sustainable chemistry
Goal 2	
Learning outcomes	2.1 Describe principles regarding reaction energetics and reaction kinetics 2.2 Apply molecular orbital theory on reactivity and stereochemistry 2.3 Describe supramolecular principles applied to reactivity
Goal 3	
Learning outcomes	3.1 Interpret ate the reactions outcome such as secondary products and yield 3.2 Describe the reactions experimental conditions (temperature, time, solvents and molar ratio) 3.3 To arrange a suitable way for the separation and purification of reaction products
Goal 4	
Learning outcomes	4.1 Describe principles for the rationalization of regio- or enantioselective reaction outcomes 4.2 Extend applying knowledge in organic chemistry on pharmaceutical chemistry,

	biochemistry, and polymer chemistry 4.3 To predict organic reaction mechanisms and conditions for novel ones.
Textbook	1.- March- Advanced Organic Chemistry –Reaction Mechanisms. 2.- Sykes- A Guidebook to Mechanism in Organic Chemistry
Supplementary references	1.- Jerry March- Advanced Organic Chemistry 2.- J[1] Clayden – Organic Chemistry

Course timeline

Week	Number of hours	Course topics	Pages (textbook)	Notes
01	**1 1 1**	Revision of organic reaction of acid- base, nucleophilic substitution and elimination reactions		
02	**1 1 1**	Revision of aromatic electrophilic substitution reactions and synthesis		
03	**1 1 1**	Revision of organic reaction of nucleophilic addition and addition-elimination reactions and synthetic methods		
04	**1 1 1**	Wagner –Meerwein rearrangement Pinacol rearangement		
05	**1 1 1**	Meerwein-Pondorff reduction		
06	**1 1 1**	Benzilic acid rearrangement Favorski reaction		
07	**1 1 1**	Wolf rearrangement		
08	**1 1 1**	Boc and Fmoc protective groups to amines		
09	**1 1 1**	Curtius rearrangement		
10	**1 1 1**	Beckmann rearrangement		
11	**1 1 1**	Schmidt reaction (rearrangement reaction)		

12	**1 1 1**	Darzens reaction Darzens condensation		
13	**1 1 1**	Lossen rearrangement Baeyer-Villiger Oxidation (rearrangement reaction)		
14	**1 1 1**	Hofmann rearrangement (degradation reaction) Claisen rearrangement Ireland-Claisen rearrangement		
15	**1 1 1**	Cope rearrangement Fries rearrangement		
16	**1 1 1**	Garbriel Synthesis Wittig Reaction		

Theoretical course evaluation methods and weight	Mid exam 30%	Seminar 30%	Final exam 40%

Approved by head of department		**Date of approval**	

Extra information (to be updated every semester by corresponding faculty member)

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