

## Course Syllabus

1	<b>Course title</b>	Special Topics in Organic Chemistry	
2	<b>Course number</b>	0353431	
3	<b>Credit hours</b>	Three	
	<b>Contact hours (theory, practical)</b>	3 hours theory/week	
4	<b>Prerequisites/corequisites</b>	0303331	
5	<b>Program title</b>	B.Sc.	
6	<b>Program code</b>	NA	
7	<b>Awarding institution</b>	The University of Jordan	
8	<b>School</b>	Science	
9	<b>Department</b>	Chemistry	
10	<b>Course Level</b>	4 <sup>th</sup> Level	
11	<b>Year of study and semester (s)</b>	4 <sup>th</sup> , First semester	
12	<b>Other department (s) involved in teaching the course</b>	B.Sc.	
13	<b>Main teaching language</b>		
14	<b>Delivery method</b>	<input checked="" type="checkbox"/> Face to face learning <input checked="" type="checkbox"/> Blended <input type="checkbox"/> Fully online	
15	<b>Online platforms(s)</b>	<input type="checkbox"/> Moodle <input type="checkbox"/> Microsoft <input checked="" type="checkbox"/> Teams <input type="checkbox"/> Skype <input type="checkbox"/> Zoom <input type="checkbox"/> Others.....	
16	<b>Issuing/Revision Date</b>		

### 17 Course Coordinator:

Name: **Prof. Dr. Jalal Zahra**

Contact hours: 10:30-11:30

Office number: 300

Phone number: 22163

Email: zahra@ju.edu.jo

**18 Other instructors:**

Name:

Office number:

Phone number:

Email:

Contact hours:

Name:

Office number:

Phone number:

Email:

Contact hours:

**19 Course Description:**

The course covers Topics of current interest in organic chemistry. Carbon-carbon bond formation reactions in organic synthesis. Skeletal–rearrangement reactions. Intermolecular reactions and neighboring group participation. Chemoselectivity. Regioselectivity. Orbitals and Organic Chemistry: Pericyclic Reactions



## 20 Course aims and learning outcomes (CLOs):

A- Course Learning Outcomes: 0353431 Special topics in organic chemistry

Upon successful completion of this course, students will be able to:

- CLO-1** To provide the students with the knowledge and capacity to relate the structures of organic compounds with their reactivity and properties.
- CLO-2** Outline mechanisms for reactions in organic chemistry
- CLO-3** Apply carbon-carbon bond formation reactions in organic synthesis.
- CLO-4** Describe principles of rearrangements and neighboring group participation in organic chemistry.
- CLO-5** Describe principles for the explanation of regio- or Chemoselective reaction outcomes.
- CLO-6** Apply molecular orbital theory on reactivity and stereochemistry

### B- Students Learning Outcomes (SLOs):

- SO-1. Problem Solving: Graduates will be able to apply mathematical and scientific knowledge to identify, formulate, and solve technical or scientific problems relevant to the discipline of chemistry.
- SO-2. Design: Graduates will be able to use their understanding of chemistry concepts and principles to formulate and design systems, processes, procedures, or programs to meet desired goals and outcomes.
- SO-3. Experimental Skills: Graduates will be able to design, conduct, and analyze experiments or test hypotheses, utilizing appropriate chemical techniques and scientific judgment to draw meaningful conclusions.
- SO-4. Communication: Graduates will be able to communicate scientific information effectively and accurately to a range of audiences, including both technical and non-technical audiences.
- SO-5. Ethics and Global Context: Graduates will understand and apply ethical and professional responsibilities in the context of the impact of technical and scientific solutions on global, economic, environmental, and societal issues.
- SO-6. Teamwork: Graduates will be able to work effectively as part of a team, establishing goals, planning tasks, meeting deadlines, and analyzing risk and uncertainty in the context of chemistry-related projects and initiatives.
- SO-7. Handling Chemicals: An ability to apply the proper procedures for safe handling of chemicals.

### 0333336 Identification of Organic Compounds

		Student Outcomes (SO)						
		SO-1	SO-2	SO-3	SO-4	SO-5	SO-6	SO-7
Course Learning Outcomes (CLO)	CLO-1	✓	✓					
	CLO-2	✓	✓					
	CLO-3	✓	✓					
	CLO-4	✓	✓					
	CLO-5	✓	✓					
	CLO-6	✓	✓					

## 21. Topic Outline and Schedule:

Lecture	Topic	Student Learning Outcome	Learning Methods (Face to Face/Blended / Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources	
1	1.1	Coupling reactions of organocuprate reagents (introduction)	CLO-1 CLO-2	Face to Face	Classroom		midterm exam, Final exam	Organic Chemistry, Janci Smith, 4th edition
	1.2	Coupling reactions of organocuprate reagents (examples and mechanism)	CLO-1 CLO-2	Face to Face	Classroom		midterm exam, Final exam	Organic Chemistry, Janci Smith, 4th edition
	1.3	Heck reaction	CLO-1 CLO-2	Face to Face	Classroom		midterm exam, Final exam	Organic Chemistry, Janci Smith, 4th edition
	1.4	Grignard reaction	CLO-1 CLO-2	Blended	e-learning		Quiz Final exam	Organic Chemistry, Janci Smith, 4th edition
	1.5	Grignard reaction	CLO-1 CLO-2	Blended	e-learning		Quiz Final exam	Organic Chemistry, Janci Smith, 4th edition
2	2.1	Carbenes and cyclopropene synthesis	CLO-1 CLO-2	Face to Face	Classroom		midterm exam, Final exam	Organic Chemistry, Janci Smith, 4th edition
	2.2	Simmons- Smith Reaction	CLO-1 CLO-2	Face to Face	Classroom		midterm exam, Final exam	Organic Chemistry, Janci Smith, 4th edition
	2.3	Metathesis	CLO-1 CLO-2	Face to Face	Classroom		midterm exam, Final exam	Organic Chemistry, Janci Smith, 4th edition
	2.4	Suzuki reactions	CLO-1 CLO-2	Blended	e-learning (recorded lecture)		Quiz Final exam	Organic Chemistry, Janci Smith, 4th edition
	2.5	Wittig reaction	CLO-1 CLO-2	Blended	e-learning (recorded lecture)		Quiz Final exam	Organic Chemistry, Janci Smith, 4th edition
3	3.1	Carbon-carbon rearrangements	CLO-1 CLO-2	Face to Face	Classroom		midterm exam, Final exam	Organic Chemistry, Fox and Whitesell, 3rd Edition

	3.2	cationic rearrangements, anionic rearrangements	CLO-1 CLO-2	Face to Face	Classroom		midterm exam, Final exam	Organic Chemistry, Fox and Whitesell, 3rd Edition
	3.3	Carbon-nitrogen rearrangements	CLO-1 CLO-2	Face to Face	Classroom		midterm exam, Final exam	Organic Chemistry, Fox and Whitesell, 3rd Edition
	3.4	Heteroatom as neighboring groups	CLO-1 CLO-2	Blended	e-learning (recorded lecture)		Quiz Final exam	Organic Chemistry, Johns and Fleming, 4 <sup>th</sup> edition.
	3.5	neighboring $\pi$ systems	CLO-1 CLO-2	Blended	e-learning (recorded lecture)		Quiz Final exam	Organic Chemistry, Johns and Fleming, 4 <sup>th</sup> edition.
4	4.1	The Beckman rearrangements, The Hofmann rearrangements	CLO-1 CLO-2	Face to Face	Classroom		midterm exam, Final exam	Organic Chemistry, Fox and Whitesell, 3rd Edition
	4.2	Curtius rearrangements The Baeyer Villiger oxidation;	CLO-1 CLO-2	Face to Face	Classroom		midterm exam, Final exam	Organic Chemistry, Fox and Whitesell, 3rd Edition
	4.3	Orbitals and organic chemistry: pericyclic reactions.	CLO-1 CLO-2	Face to Face	Classroom		midterm exam, Final exam	Organic Chemistry, Clayden and Warren. 2nd edition, 2012
		single bonds and neighboring groups-1	CLO-1 CLO-2	Blended	e-learning (recorded lecture)		Quiz	Organic Chemistry, Johns and Fleming, 4 <sup>th</sup> edition.
		single bonds and neighboring groups-2	CLO-1 CLO-2	Blended	e-learning (recorded lecture)		Final exam	Organic Chemistry, Johns and Fleming, 4 <sup>th</sup> edition.
5	5.1	Molecular orbitals of conjugated $\pi$ systems	CLO-1 CLO-2	Face to Face	Classroom		midterm exam, Final exam	Organic Chemistry, Clayden and Warren. 2nd edition, 2012
	5.2	electrocyclic reactions, thermal and photochemical electrocyclic reactions,	CLO-1 CLO-2	Face to Face	Classroom		midterm exam, Final exam	Organic Chemistry, Clayden and Warren. 2nd edition, 2012
	5.3	cycloaddition reactions,	CLO-1 CLO-2	Face to Face	Classroom		midterm exam, Final exam	Organic Chemistry, Clayden and Warren. 2nd edition, 2012

		Regioselectivity in electrophilic aromatic substitution,	CLO-1 CLO-2	Blended	e-learning (recorded lecture)		Quiz Final exam	Organic Chemistry, Clayden and Warren. 2nd edition, 2012
		electrophilic attack on alkenes,	CLO-1 CLO-2	Blended	e-learning (recorded lecture)		Quiz Final exam	Organic Chemistry, Clayden and Warren. 2nd edition, 2012
6	6.1	Sigmatropic rearrangements	CLO-1 CLO-2	Face to Face	Classroom		Final exam	Organic Chemistry, Clayden and Warren. 2nd edition, 2012
	6.2	Reduction of carbonyl compounds	CLO-1 CLO-2	Face to Face	Classroom		Final exam	Organic Chemistry, Clayden and Warren. 2nd edition, 2012
	6.3	Selectivity, Reducing agents	CLO-1 CLO-2	Face to Face	Classroom		Final exam	Organic Chemistry, Clayden and Warren. 2nd edition, 2012
		Regioselectivity in radical reactions,	CLO-1 CLO-2	Blended	e-learning (recorded lecture)		Quiz Final exam	Organic Chemistry, Clayden and Warren. 2nd edition, 2012
		Nucleophilic attack on allylic compounds, conjugate addition.	CLO-1 CLO-2	Blended	e-learning (recorded lecture)		Quiz Final exam	Organic Chemistry, Clayden and Warren. 2nd edition, 2012
7	7.1	Hydrogen as reducing agents	CLO-1 CLO-2	Face to Face	Classroom		Final exam	Organic Chemistry, Clayden and Warren. 2nd edition, 2012
	7.2	Getting rid of functional groups	CLO-1 CLO-2	Face to Face	Classroom		Final exam	Organic Chemistry, Clayden and Warren. 2nd edition, 2012
	7.3	dissolving metal reductions, selectivity in oxidization reactions	CLO-1 CLO-2	Face to Face	Classroom		Final exam	Organic Chemistry, Clayden and Warren. 2nd edition, 2012
		Preparation and presentation of a report (brief review) on a selected topic or reaction related to the above items.			e-learning		report	

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## 22 Evaluation Methods:

Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform
quizzes	30%	Intramolecular reactions and neighboring group participation; Regioselectivity	CLO-1 CLO-2 CLO-4 CLO-5	Three weeks	In the department and e-learning
Mid exam	30%	Carbon-carbon Bond formation reactions in organic synthesis; Skeletal – Rearrangement Reactions	CLO-1 CLO-2 CLO-3 CLO-4	Three weeks	In the department
Final exam	50%		CLO-1 CLO-2 CLO-3 CLO-4 CLO-5 CLO-6	Seven weeks	In the department

## 23 Course Requirements

(e.g., students should have a computer, internet connection, webcam, account on a specific software/platform... etc.): Students should have a laptop internet connection.

## 24 Course Policies:



A- Attendance policies: A- Attendance policies:

A maximum of 15% absence is allowed.

B- Absences from exams and submitting assignments on time:

Incomplete Exams are conducted later after arranging a new date.

C- Health and safety procedures:

This is a theoretical course.

D- Honesty policy regarding cheating, plagiarism, and misbehavior:

The general Jordan University's laws are applied in any case of cheating.

E- Grading policy:

The letters scale is applied.

F- Available university services that support achievement in the course:

Free Internet access and E-learning.

## 25 References:

A- Required book(s), assigned reading and audio-visuals:

B- Recommended books, materials, and media:

## 26 Additional information:



Name of Course Coordinator: -----Signature: ----- Date: ----- -----
Head of Curriculum Committee/Department: ----- Signature: ----- ---
Head of Department: ----- Signature: ----- -
Head of Curriculum Committee/Faculty: ----- Signature: ----- -
Dean: ----- Signature: -----