



ASU
جامعة العلوم التطبيقية الخاصة
APPLIED SCIENCE PRIVATE UNIVERSITY

AMMAN - JORDAN



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جامعة كل العرب

Faculty of Arts and Science
Course Syllabus
Semester First
Academic Year 2022/2023

Course Title:	Systematic identification of Organic compounds
Course No.:	1722411
Prerequisite:	1722310
Concurrent:	1722310
Department:	Chemistry
Coordinator:	Nawal Bahtiti

***Instructor:**

Name	Office Number	Office Phone	Office Hours	E-mail
Nawal Bahtiti	2017	1103	Su. Tu. Thu 10.0-13.0 Mon. 11-12	Nawal_h@asu.edu.jo

*** Course Description:**

Multistep syntheses; classification tests for functional groups; identification of unknown organic compounds by physical, chemical and spectroscopic techniques, and by the preparation of derivatives. The course also includes a series of lectures related to the theoretical aspects of the experimental part

*** Learning Outcomes:**

Successful completion of this course should lead to the following learning outcomes:

A-Knowledge and Understanding:

- A1) Be able to understand the basic concepts of *tests of identification*
- A2) Be able to understand the basic concepts of *separations*
- A3) Be able to understand the basic concepts of *functional groups*
- A4) Understand concepts of preparations of chemical reactions.

B-Intellectual Skills:

- B1) Distinguish energy applications needs and requirements
- B2) Analyze and compare the different applications requirements

C-Subject Specific Skills:

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- C1) Implement solution of Organic reactions.
- C2) Implement solution of mechanisms of organic chemistry.
- C3) Learn how to implement different synthesis methods in organic chemistry.

D-Transferable Skills:

- D1) Homework and quizzes
- D2) Experiments
- D3) Assignments and Reports

Program Learning Outcomes (PLOs):

1. Describe the fundamentals of chemistry including structure, reactivity and properties of chemical substances, different situation of reaction and the states of matter.
2. Construct essential facts, principles and theories across the four principal areas of chemistry, i.e., analytical, organic, inorganic and physical.
3. Align major issues currently at the frontiers of chemical research and development
4. Memorize certain knowledge in Arabic and English languages, computer science, Islamic religion
5. Differentiate between the different states of the matter, elements and compounds based on the recognition and quantification of the properties
6. Analyze chemical and spectral data to identify and confirm chemical structures as well as determine chemical composition.
7. Establish and conclude mechanisms for physical and chemical processes.
8. Demonstrate adequate life-long learning skills
9. Select appropriate techniques and procedures for chemical synthesis and analysis.
10. Interpret data derived from laboratory observations and measurements in terms of their significance and the theory underlying them.
11. Employ computational software's and data- processing skills in handling of chemical information and analysis of chemical data.
12. Assemble and use properly chemistry experimental setups
13. Perform correctly quantitative measurements requiring accurate and precise manipulations.

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* Course Contents and Schedule:

Week	Experiments	Topics Details	CLOs	PLOs
I+2	Introduction	The Need for Organic Qualitative Analysis , Suggestions to Students and Instructors ,Laboratory Safety		
3+4	1	Preliminary Examination , Physical Properties , Molecular Weight Determination , Molecular Formula Determination , Solubility Tests , Infrared, Nuclear Magnetic Resonance, and Mass Spectra Analyses , Classification Tests , Preparation of a Satisfactory Derivative , Mixtures , Report Form Unknowns	A1.B1,C1,D1,D2, D3	1,2,3,5,6,7,8,11,12,13
5+6	2	Preliminary Examination , Physical State , Color , Odor , Ignition Test , Summary and Applications , Determination of Physical Properties , Melting Points and Freezing Points , Boiling Point , Specific Gravity	A1,A2,B1,B2,C1, C2,C3.D1.D2.D3	1,2,3,5,6,7,8,11,12,13
7+8	3	Index of Refraction of Liquids , Optical Rotation , Preparation of the Sample , Filling the Polari meter Tube , The Use of the Polari meter , Expression of Results , Optical Purity , Recrystallization , Qualitative Elemental Analysis , Fusion of Organic Compounds with Sodium , Quantitative Elemental Analysis , Combustion and Related Analyses	A1,A2,B1,B2,C1, C2,C3.D1.D2.D3	1,2,3,5,6,7,8,11,12,13
9	4	Preliminary Examination, Distillation and Sublimation, Distillation, Steam Distillation, Sublimation, Extractions: Separation Based upon Salt . Formation , Extraction of Water Insoluble Mixtures , Extraction of Water Soluble Mixtures , Chromatography , Thin-Layer Chromatography , Gas Chromatography , Column Chromatography , High-Performance Liquid Chromatography (HPLC)	A1,A2,B1,B2,C1, C2,C3.D1.D2.D3	1,2,3,5,6,7,8,11,12,13



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10	Mid term	Midterm exam		
11+12	5	Solubility in Water, Aqueous Acids and Bases, and Ether , Determination of Solubilities , Theory of Solubility , Theory of ACid-Base Solubility , Solubility in Water , Solubility in 5% HydrochlORiC Acid Solution , Solubility in 5% Sodium Hydroxide and 5% Sodium Bicarbonate Solutions , Solubility of AmphoteriC Compounds , Solubility in Cold, Concentrated Sulfuric Acid ,Borderlines Between Solubility Classes , Solubility in Organic Solvents	A1,A2,B1,B2,C1, C2,C3.D1.D2.D3	1,2,3,5,6,7,8,11,12,13
13+14	6	Theory of Nuclear Magnetic Resonance , Chemical Shift , Shielding and Deshielding , Preparation of the Sample ,Proton Spectra , Chemical Shift	A1,A2,B1,B2,C1, C2,C3.D1.D2.D3	1,2,3,5,6,7,8,11,12,13
14-15		Revision		
Fifteen	Final	Final Exam		

*** Teaching Methods:**

- Inter active lectures
- Group discussions
- Practical Experiments
- Written assignments

*** Evaluation:**

Mid Term Exam	20%
Assignments.	40%
Final Exam	20%
Total	100%

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Text Book

The Systematic Identification of Organic Compounds Copyright 2014 © John Wiley & Sons Ralph Shriner and Reynold Fusion

Other References

Organic Chemistry: A Short Course (13th Edition) by Harold Hart, Christopher M. Hadad, Leslie E. Craine, David J. Hart 2020.

2. Fundamentals of Organic Chemistry (7th Edition) by John E. McMurry 2019

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Subject Coordinator:

Nawal H Bahtiti

Signature:

Head of Curriculum Committee

Dr. Hussam Miqdad

Signature:

Department Head

Dr. Hussam Miqdad

Signature:

Dean Faculty

Dr. Hadeel Saeed

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Copy to:

Department Head.

Head of Curriculum Committee.

Course File.

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