



Jordan University of Science and Technology
Faculty of Science & Arts
Chemistry Department

CHEM214 Organic Chemistry Lab (2)

Second Semester 2023-2024

Course Catalog

1 Credit Hours. This laboratory course is designed to provide students with hands-on experience in the synthesis, purification, and characterization of organic compounds. The experiments listed below are representative of the types of reactions and techniques covered in the course: Dehydration of Alcohols: Students will explore the dehydration reaction, converting alcohols into alkenes. Specifically, they will synthesize cyclohexene from cyclohexanol. Oxidation of an Alcohol to a Ketone: This experiment focuses on oxidation reactions, where students will oxidize an alcohol to form a ketone. Hypochlorite Oxidation of Acetophenone by the Haloform Reaction: Students will conduct the haloform reaction to oxidize acetophenone using hypochlorite, resulting in the formation of a carboxylic acid and a halogen-substituted compound. Reduction of Vanillin with Sodium Borohydride: This experiment involves the reduction of vanillin to form vanillyl alcohol using sodium borohydride as a reducing agent. Synthesis of Triphenylmethanol: Students will perform the synthesis of triphenylmethanol from benzophenone and bromobenzene. Williamson Ether Synthesis: This experiment focuses on the synthesis of ethers using the Williamson ether synthesis method, resulting in the preparation of phenoxyacetic acid. Directing Effects in Aromatic Bromination: Students will explore the directing effects of functional groups in aromatic compounds through bromination reactions, specifically brominating vanillin. Synthesis of 4,4'-Di-tert-Butylbiphenyl: This experiment involves the synthesis of a substituted biphenyl compound. Synthesis of Benzocaine: Students will synthesize benzocaine, an ester local anesthetic, through a multistep reaction sequence. Throughout the course, students will learn various techniques in organic synthesis, purification, and characterization, including column chromatography and distillation.

Teaching Method: On Campus

Text Book

Title	Laboratory Manual for General, Organic, And Biological Chemistry
Author(s)	Timberlake KC
Edition	3rd Edition
Short Name	Lab Manual
Other Information	

Instructor

Name	Mr. Amer Alshiekh Ali
Office Location	-

Office Hours	
Email	amer47@just.edu.jo

Instructor	
Name	Mr. Tareq Harahsheh
Office Location	-
Office Hours	
Email	tkharahsheh@just.edu.jo

Class Schedule & Room
<p>Section 1: Lecture Time: Sun : 10:30 - 13:30 Room: LAB6 (D3 L-2)</p> <p>Section 2: Lecture Time: Sun : 08:30 - 11:30 Room: LAB5 (D3 L-2)</p> <p>Section 3: Lecture Time: Sun : 13:30 - 16:30 Room: LAB6 (D3 L-2)</p> <p>Section 4: Lecture Time: Sun : 13:30 - 16:30 Room: LAB5 (D3 L-2)</p> <p>Section 5: Lecture Time: Mon : 13:30 - 16:30 Room: LAB6 (D3 L-2)</p> <p>Section 6: Lecture Time: Mon : 13:30 - 16:30 Room: LAB5 (D3 L-2)</p>

Prerequisites		
Line Number	Course Name	Prerequisite Type
911130	CHEM113 Organic Chemistry Lab(1)	Prerequisite / Pass
912120	CHEM212 Organic Chemistry (2)	Pre./Con.

Tentative List of Topics Covered		
Weeks	Topic	References
Week 1	Check In	From Lab Manual

Week 2	Dehydration Of Alcohols, Cyclohexene from Cyclohexanol	From Lab Manual
Week 3	The Oxidation of An Alcohol to A Ketone	
Week 4	Hypochlorite Oxidation of Acetophenone by the Haloform Reaction	From Lab Manual
Week 5	Reduction of Vanillin with Sodium Borohydride to form Vanillyl Alcohol	From Lab Manual
Week 6	Synthesis of Triphenylmethanol from Benzophenone and Bromobenzene	From Lab Manual
Week 7	Williamson Ether Synthesis, Preparation of phenoxyacetic acid	From Lab Manual
Week 8	Directing Effects in Aromatic Bromination, Bromination of Vanillin	From Lab Manual
Week 9	Synthesis of 4,4'-Di-tert-Butylbiphenyl	From Lab Manual
Week 10	Synthesis of Benzocaine	From Lab Manual
Week 11	The Sandmeyer Reaction: p-hydroxyazobenzene (Solvent Yellow 7) and 2-Iodobenzoic Acid	From Lab Manual
Week 12	Check Out	From Lab Manual

Relationship to Program Student Outcomes (Out of 100%)

a	b	c	d	e	f	g	h	i	j	k

Policy

The Course Policies for Organic Chemistry II Lab, encompassing the listed experiments, may include the following guidelines:

- 1. Attendance and Punctuality:** Regular attendance is mandatory for all lab sessions. Tardiness without valid reasons may result in grade penalties or exclusion from the lab session. If unable to attend due to illness or other unavoidable circumstances, students must notify the instructor in advance.
- 2. Laboratory Safety:** Adherence to safety protocols is paramount. Students must wear appropriate personal protective equipment (PPE), including safety goggles and lab coats, at all times during laboratory sessions. Familiarity with the location and proper use of safety equipment, emergency procedures, and the Material Safety Data Sheets (MSDS) for all chemicals used in experiments is mandatory.
- 3. Laboratory Conduct:** Students are expected to conduct themselves responsibly and professionally in the laboratory. This includes following instructions carefully, refraining from horseplay or behavior that may endanger themselves or others, and maintaining a clean and organized workspace.
- 4. Preparation and Pre-lab Work:** Prior to each lab session, students must review the experiment procedures, relevant background information, and any assigned pre-lab

questions or readings. Completion of pre-lab assignments is essential for understanding the experiment and ensuring smooth progress during the lab session.

5. Experiment Procedures: Students must strictly adhere to the experimental procedures outlined in the lab manual. Deviations from the prescribed protocols must be approved by the instructor beforehand. Any modifications or unexpected observations during the experiment should be documented accurately in the lab notebook.

6. Data Recording and Analysis: Accurate and detailed record-keeping is essential. Students are required to record all experimental observations, measurements, and results in their lab notebooks in a neat and organized manner. Data analysis, including calculations, interpretation of spectra, and discussion of results, should be completed promptly after each experiment.

7. Clean-up and Equipment Care: At the conclusion of each lab session, students must clean up their work area, properly dispose of waste materials, and return all equipment and glassware to designated locations. Failure to maintain cleanliness or damage to laboratory equipment may result in disciplinary action or financial penalties.

8. Academic Integrity: All work submitted in the lab, including pre-lab assignments, experimental data, and reports, must be original and completed individually unless specified otherwise by the instructor. Any instances of plagiarism, unauthorized collaboration, or academic dishonesty will be subject to disciplinary action in accordance with the university's academic integrity policy.

9. Communication: Students are encouraged to communicate openly with the instructor regarding any questions, concerns, or difficulties they encounter during the course. The instructor's office hours and contact information will be provided for this purpose.

10. Grading and Evaluation: Assessment in the lab will be based on various factors, including attendance, participation, completion of pre-lab assignments, experimental technique, data recording and analysis, laboratory reports, and overall professionalism. Grading rubrics will be provided for each assignment or assessment component, outlining the criteria for evaluation.

These course policies aim to ensure a safe, productive, and equitable learning environment for all students enrolled in Organic Chemistry II Lab. Students are responsible for familiarizing themselves with these guidelines and adhering to them throughout the duration of the course.