Lahore University of Management Sciences

CHEM 230 – ORGANIC CHEMISTRY LAB 1

Spring 2023-2024

Instructor	Irshad Hussain
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TA Office Hours	TBA
Course URL (if any)	

Course Teaching Methodology (Please mention following details in plain text)

- Teaching Methodology: Synchronous
- Lecture details: Percentage of recorded and live interaction lectures

  All the pre-lab lectures and lab sessions will be in-person, unless advised otherwise by the university.

Course Basics				
Credit Hours	02			
Lecture(s)	Nbr of Lec(s) Per Week	01	Duration	30-60 min
Recitation (per week)	Nbr of Rec (s) Per Week		Duration	
Lab (if any) per week	Nbr of Session(s) Per Week	01	Duration	~4 – 5 hours
Tutorial (per week)	Nbr of Tut(s) Per Week		Duration	

Course Distribution	
Core	Biology & Chemistry majors
Elective	SSE students – consent required from the instructor
Open for Student Category	
Closed for Student Category	

COURSE DESCRIPTION

This introductory lab course is designed to familiarize students to the basic skills and techniques used in organic chemistry. These techniques include separation, purification and identification of organic compounds based on crystallization, chromatographic separation/purification, solvent extraction, fractional distillation for separation/purification, and spectroscopic techniques such as UV – Vis and IR spectroscopy for product identification. Students will also perform simple one-step as well as multistep synthesis of dye and drug molecules and characterize them using various tools. Students will experience practical demonstration of most of the organic chemistry concepts learnt in CHEM 231 "Fundamentals of Organic Chemistry" during the Fall semester, 2022.

COURSE PREREQUISITE(S)

- CHEM 231: Fundamentals of Organic Chemistry

COURSE OBJECTIVES

- To familiarize students with the standard techniques for the isolation, synthesis and purification of simple organic compounds and their subsequent characterization using UV-visible, IR and possibly GC-MS and NMR spectroscopic techniques.

Learning Outcomes

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•	At the end of this course, the students should be able to: - Purification of organic compounds by re-crystallization - Isolate and purify the components of a mixture of organic compounds in aqueous/organic media - Extraction of natural products using steam distillation - Synthesis of simple organic compounds such as artificial flavoring agent, para-red dye etc. - Synthesis of organic compounds based on Wittig reaction and Friedel Crafts acylation reaction - Synthesis of organic compounds/drugs using multiple steps.

Grading Breakup and Policy

Pre-lab quizzes	30 %
Lab reports	30 %
Lab performance & safety	25 %
Viva voce	15 %

Instructor has the privilege to change the grading scheme which, if availed, will be conveyed to the students well in time.

Examination Detail

Midterm Exam	Yes/No: No Combine Separate: Duration: Preferred Date: Exam Specifications:
Final Exam	Yes/No: No Combine Separate: Duration: Exam Specifications:

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COURSE OVERVIEW			
Lab experiments	Topics	Recommended Readings	Objectives/ Application
Week 1	Introduction to the characterization tools and ChemDraw	Provided manual	To learn to draw structural formulae of simple and complex organic compounds
Week 2	Purification of organic compounds by re-crystallization	Provided manual	To learn to purify organic compounds by selective precipitation and filtration
Week 3	Isolation of antioxidant compounds from tomatoes	Provided manual	To learn to isolate organic compounds from natural resources using column chromatography
Week 4	Extraction of piperine from black pepper (Piper nigrum)	Provided manual	To learn to isolate organic compounds from natural resources using column chromatography
Week 5	Extraction of natural products by steam distillation	Provided manual	To learn to isolate natural products from natural resources using steam distillation
Week 6	Synthesis of artificial flavoring agent	Provided manual	To learn to synthesize, purify and characterize simple organic compounds
Week 7	Synthesis of para-red Dye	Provided manual	To learn to synthesize, purify and characterize simple organic compounds
Week 8	Stereoisomeric study of Wittig reaction	Provided manual	To learn to synthesize, purify and characterize simple organic compounds
Week 9	Demonstration of Friedel-Crafts acylation reaction	Provided manual	To learn to synthesize, purify and characterize simple organic compounds
Week 10-12	Multistep synthesis of anticonvulsant drug	Provided manual	To learn to synthesize, purify and characterize simple organic compounds/drugs using multi-step synthesis

Textbook(s)/Supplementary Readings
Textbook: Vogel's Text Book of Practical Organic Chemistry, By Brian S. Furniss, Antony J. Hannaford, Peter W. G. Smith and Austin R. Tatchell. Others recommended readings: Various web links given in the Lab manual at the end of each experiment

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Academic Honesty

The principles of truth and honesty are recognized as fundamental to a community of teachers and students. This means that all academic work will be done by the student to whom it is assigned without unauthorized aid of any kind. Plagiarism, cheating and other forms of academic dishonesty are prohibited. Any instances of academic dishonesty in this course (intentional or unintentional) will be dealt with swiftly and severely. Potential penalties include receiving a failing grade on the assignment in question or in the course overall. For further information, students should make themselves familiar with the relevant section of the LUMS student handbook.

Harassment Policy

SSE, LUMS and particularly this class, is a harassment free zone. There is absolutely zero tolerance for any behaviour that is intended or has the expected result of making anyone uncomfortable and negatively impacts the class environment, or any individual's ability to work to the best of their potential.

In case a differently-abled student requires accommodations for fully participating in the course, students are advised to contact the instructor so that they can be facilitated accordingly.

If you think that you may be a victim of harassment, or if you have observed any harassment occurring in the purview of this class, please reach out and speak to me. If you are a victim, I strongly encourage you to reach out to the Office of Accessibility and Inclusion at oai@lums.edu.pk or the sexual harassment inquiry committee at harassment@lums.edu.pk for any queries, clarifications, or advice. You may choose to file an informal or a formal complaint to put an end of offending behavior. You can find more details regarding the LUMS sexual harassment policy here.

To file a complaint, please write to harassment@lums.edu.pk.

SSE Council on Equity and Belonging

In addition to LUMS resources, SSE's **Council on Belonging and Equity** is committed to devising ways to provide a safe, inclusive and respectful learning environment for students, faculty and staff. To seek counsel related to any issues, please feel free to approach either a member of the council or email at cbe.sse@lums.edu.pk

Rights and Code of Conduct for Online Teaching

This course is being planned to be in person, but in case of exceptional circumstances may go online. In that case, any misuse of online modes of communication is unacceptable. TAs and Faculty will seek consent before the recording of live online lectures or tutorials if needed. Please ensure if you do not wish to be recorded during a session to inform the faculty member. Please also ensure that you prioritize formal means of communication (email & LMS etc.) over informal means to communicate with course staff.