CHEM 241 – ORGANIC CHEMISTRY LABORATORY 1: FUNDAMENTAL TECHNIQUES – FALL 2025

1. COURSE SECTIONS

Section	CRN	Day/Time/Location	Instructor
1	28951	T, 9:30 - 12:20, FB 544, 546	Dr. Jordon Froese
2	28952	R, 9:30 - 12:20, FB 544, 546	Dr. Ryan Jeske
3	28953	T, 2:00 - 4:50, FB 544, 546	Dr. Sabina Maskey
4	28954	T, 9:30 - 12:20, FB 544, 556	Dr. Philip Albiniak
5	28956	R, 9:30 - 12:20, FB 544, 556	Dr. Sabina Maskey
6	28958	W, 2:00 - 4:50, FB 544, 546	Dr. Sundeep Rayat (Lab Coordinator)
7	28964	R, 2:00 - 4:50, FB 544, 546	Dr. Ryan Jeske
8	28965	R, 2:00 - 4:50, FB 544, 556	Dr. Sabina Maskey
9	29594	M, 2:00 - 4:50, FB 544, 546	Dr. Ryan Jeske

2. INSTRUCTOR INFORMATION

Instructor	Address	Office	Email	Phone	Office Hours
Dr. Rayat	Department of Chemistry Ball State University Muncie, IN	FB 502	srayat@bsu.edu	765-285-8308	M 1:30 – 3pm W 12 – 1:30pm
Dr. Albiniak		FB 505	paalbiniak@bsu.edu	765-285-8183	M, W, Th, F 2 – 3pm
Dr. Froese		FB 413	jtfroese@bsu.edu	765-285-8060	T 2:30 – 4pm F 10:30 – 12pm
Dr. Jeske		FB 311	rjeske@bsu.edu	765-285-8078	M 10 -11am W 11 – 12pm; 1 - 2pm
Dr. Maskey		FB 415	sabina.maskey@bsu.edu	765-285-8060	T 10 – 11:30am W 1 – 2:30pm

3. COURSE INFORMATION

3.1 Course Description: One-term sophomore level laboratory course designed to be taken in the same semester as the first term of organic chemistry lecture. This lab course will introduce students to the fundamental principles and laboratory techniques of organic chemistry including extraction, recrystallization, separation, distillation, chromatography and characterization.

3.2 Prerequisites: CHEM 112 with a grade of C or better. Parallel: CHEM 230 or 231.

3.3 Course Objectives: CHEM 241 is designed as the laboratory companion course to the first semester of organic chemistry lecture (CHEM 230 or 231). The course will introduce students to the fundamental laboratory techniques while reinforcing the principles covered in lecture. The students will demonstrate an understanding of the theoretical principles that underlie the methodologies covered in this course as well as their familiarity with experimental design and purpose. Students are expected to participate in experimental data collection, data analysis, and demonstrate that they can present information in a clear and concise manner using organic chemistry terminology. Upon successful completion, students will be able to accomplish these learning objectives:

- Use lab safety protocols and demonstrate safe handling of chemicals.
- Identify and properly use common organic chemistry laboratory equipment.
- Perform basic laboratory techniques such as recrystallization, extraction, distillation, melting point analysis and chromatography.
- Execute organic reactions introduced in CHEM 230/231, applying theoretical knowledge to hands-on experimentation.

- Maintain a proper lab notebook for documenting experimental procedures, observations, and results.
- Complete assignments that assess conceptual understanding and data interpretation skills.
- Develop problem-solving skills through real-time adjustments and troubleshooting in the lab.
- Communicate laboratory results clearly and effectively in written form,
- Demonstrate scientific reasoning by interpreting data collected in lab to draw meaningful conclusions and efficiently communicate those conclusions.

3.4 Course Structure. This lab class will meet once a week for approximately two hours and fifty minutes. The number one priority in this laboratory course is safety. Read the important safety information posted on Canvas. *You are required to complete the Pre-lab Safety Quiz during the first week and achieve a score of 100% to participate in any laboratory activities beginning in Week 2. You may retake the quiz as many times as needed to attain the required perfect score.* Starting in Week 2, each class will begin with a brief pre-lab session where key instructions for that day's experiment will be provided. Afterward, you will move to the laboratory and work with your lab partner to carry out the experiment and gather the required data. The Canvas course is organized into weekly modules each highlighting the experiment to be conducted during that week. All materials (handouts, post-lab worksheets, etc.) are available in the "241 Student Materials" folder, accessible via Canvas. Review the experimental handout and meet with your lab partner **before** the lab to discuss the steps of the experiment and your roles. Afterward, complete the following steps independently.

STEP 1: Prepare your lab notebook based on the guidelines given at the beginning of each experimental handout. Watch the required technique videos (if applicable) presented in the experimental module.

> ***General Notebook preparation guidelines.*** *The first page of your notebook must include a table of contents, and all pages should be numbered. Use only blue or black ink for all entries. Record the data, and observations directly in your notebook as you perform each step—do not wait to transcribe them later. Do not erase, scribble over, or use correction fluid; instead, draw a single line through any errors so they remain legible. Take detailed notes and include diagrams whenever possible. Your lab notebook will be your sole reference during the lab practical at the end of the semester, so keep it thorough and well-organized.*

STEP 2: Complete the Pre-Lab Quiz on Canvas by midnight before the lab experiment begins. Be sure to read the experimental handout thoroughly and apply critical thinking when answering the questions, as direct answers will not be provided in the handout (Pre-lab quizzes allow only one attempt).

STEP 3: Come to the lab and bring your prepared notebook. Perform the experiment with your lab partner and record observations and results in your notebook. (You must bring your prepared notebook with you. Otherwise, you will not be allowed to perform the experiment).

STEP 4: Lab notebook check: Show your notebook to your instructor for completeness during the lab and earn points. Failure to do so will result in loss of points for that day.

STEP 5: Lab checkout: Checkout with your instructor before leaving the lab for the day. Photos showing what a clean lab area should look like are available in Module 0.

STEP 6: Submit post lab worksheet at the start of the next lab period as instructed (on paper or electronically).

4. COURSE MATERIALS

4.1 Supplies for Each Lab: Required

- Safety Goggles
- Lab Coat (preferably with a Name Tag via sticker, ink, sewing, or other visible idea)
- A composition lab notebook (spiral bound notebooks are NOT acceptable) and a pen
- Clothing which covers all skin below the rib cage including the ankles
- Flat soled shoes that cover the entire foot (no ballet flats, sandals, etc.)

4.2 Textbook: Recommended

The Organic Chem Lab Survival Manual: A Student's Guide to Techniques 10th Edition by James W. Zubrick (online editions and previous editions OK)

- ISBN-13: 978-1118875780
- ISBN-10: 9781118875780

5. COURSE SCHEDULE

This semester will consist of ten wet labs and two additional non-experimental assignments, all of which are outlined below. Please note that the schedule is subject to change throughout the term. The most current version will always be available on Canvas. Be sure to check Canvas regularly for updates, and don't hesitate to reach out with any questions.

5.1 Wet Labs

- Experiment 1: Recrystallization, Filtration, & Melting Ranges
- Experiment 2: Liquid-Liquid Extraction (Acid/Neutral)
- Experiment 3: Liquid-Liquid Extraction (Base/Neutral)
- Experiment 4: Liquid-Liquid Extraction (Acid/base/neutral)
- Experiment 5: Acid Base Reactions and Buffer Solutions
- Experiment 6: Distillation and Reflux Experiment
- Experiment 7: Thin Layer Chromatography
- Experiment 8: Nucleophilic Substitution
- Experiment 9: Bromination of Stilbene
- Experiment 10: Elimination of an Alcohol

5.2 Other Assignments

- Assignment 1: Stoichiometry 'First Day' Worksheet
- Assignment 2: IR Post-Lab Worksheet

6. COURSE ASSIGNMENTS AND ASSESSMENT

6.1 Course Assignments. CHEM 241 will evaluate students by a variety of methods demonstrating the understanding of laboratory techniques and interpretations which includes:

- *Pre-Lab Safety and Syllabus Quiz* to ensure students understand essential safety protocols, course expectations, and are familiar with the objectives of the laboratory course. (Multiple attempts allowed)
- *Pre-Lab Quizzes* to ensure that students come prepared by reading the experimental handout and making appropriate notes in their lab notebooks. (Pre-lab quizzes allow only one attempt)
- *Post-Lab Worksheets and Other Assignments* to ensure students understand the experiments, accurately interpret data, and effectively communicate technical ideas in writing.
- *Lab Notebook Evaluation* to ensure students are prepared before the lab, and correctly record observations, data, and results during the experiment.
- *Lab Practical* to ensure students can demonstrate hands-on proficiency with lab techniques, follow proper procedures, and work independently under timed conditions.
- *Midterm and Final Exams* to ensure students have a comprehensive understanding of theoretical concepts, can analyze and interpret data, and apply their knowledge to new experimental scenarios.
- *Lab Checkout* to ensure students follow proper safety and cleanup procedures, return all equipment in good condition, and leave their workstations organized for future use.

The pre-lab quizzes, experimental instructions, relevant videos, and due dates will be posted and updated on Canvas. Please check Canvas regularly to stay informed and on track.

6.2 **Course Grading Scale**: Your grades will be based on a maximum of **440 points** distributed as follows:

	Points	**%**
Syllabus/pre-lab safety quiz/lab map	14	3
Pre-lab quizzes	53	12
Assignments/Post-Lab Worksheets	240	54.5
Lab Notebook pages	22	5
Midterm Exam, final and lab practical	100	23
Lab Checkout	11	2.5
Total	**440**	**100**

The grading scale will be determined based on an overall percentage score. The approximate score ranges are as follows (although we reserve the right to modify these slightly if necessary):

A	93.0 – 100	B-	80.0 – 82.99	D+	67.0 – 69.99
A-	90.0 – 92.99	C+	77.0 – 79.99	D	63.0 – 66.99
B+	87.0 – 89.99	C	73.0 – 76.99	D-	60.0 – 62.99
B	83.0 – 86.99	C-	70.0 – 72.99	F	< 59.99

Penalties

- A 20% deduction will be applied if proper safety precautions are not followed in the lab (e.g., failure to wear goggles or appropriate clothing).
- A 20% deduction will be applied for tardiness to the lab. If you arrive late and miss critical pre-lab instructions, you may be prohibited from participating in the lab session.
- A 100% deduction will be applied for pre-lab quizzes submitted late (canvas grade will be manually revised).
- A 10% deduction will be applied for assignments (worksheets etc.) submitted up to 15 minutes late.
- A 50% deduction will be applied for assignments (worksheets etc.) submitted within 48 hours after the deadline. Assignments submitted later than 48 hours will receive a zero.
- A 100% deduction will be applied for plagiarism from experimental handouts.

6.3 **Extra Credit Opportunity.** You can earn 0.5 extra credit (up to 5 points for the entire semester) for each typo or chemistry related error you find in the course materials. To get credit, you would need to submit the error using this link, also provided under Module 0. This is what you would need to do:

- Name the pre-lab quiz, experimental handout or worksheet where you found the error.
- Attach a screenshot of the page showing typo/error
- A short sentence describing the typo/error and a proposed correction.

Please note two things:

- First, only one student can get credit for a specific error. When you submit the error, it will show the timestamp when it was submitted. To get the extra credit, you must be the first one to report the error.
- Secondly, if you downloaded an experimental handout or worksheet two weeks ago and found the error, check the updated file on OneDrive folder to make sure it still exists. It is possible another student reported the error, and it was already corrected before you found it.

6.4 **Additional Considerations.** Grading for exams and post-lab worksheets in this course is more rigorous and detailed than you may have encountered in previous classes. A thorough understanding of each question or assignment is essential to earn a passing grade. If you are unclear about any aspect of the laboratory experiments, their connection to chemical principles, or related course content, you are strongly encouraged to ask questions—both during the pre-lab discussion and the lab session itself. It is crucial to understand the purpose behind each step of the experiment. Students who come to lab prepared—knowing not just what to do, but why they are doing it—are more likely to complete the experiment successfully and have time to begin their worksheet during the session. Questions related to lab expectations, assignments, course material, and procedures are welcome at any time throughout the semester. Data shows that students who actively seek clarification and ask questions typically earn grades in the A–B range on worksheets, while those who do not ask questions often receive grades in the C–F range. Lab instructors are readily available during lab sessions, which is the optimal time to seek assistance.

7. UNIVERSITY POLICIES AND STANDARDS

7.1 University Statement. We are committed to ensuring that all members of the community are welcome, through valuing the various experiences and worldviews represented at Ball State and among those we serve. We promote a culture of respect and civil discourse. If you need course adaptations or accommodations because of a disability, please contact the instructor of record as soon as possible. Ball State's Disability Services Office coordinates services for students with disabilities; documentation of a disability needs to be on file in that office before any accommodations can be provided. Disability Services can be contacted at 765-285-5293 or dsd@bsu.edu.

7.2 Freedom of Expression. In this course, we are committed to fostering a learning environment that values intellectual diversity, encourages free expression, and promotes open inquiry. As members of the Ball State Community, we treat each person in the Ball State community with civility, courtesy, compassion, and dignity and respect and learn from differences in people, ideas, and opinions. Please review Ball State University's Statement on Freedom of Expression, the resources on Ball State's Freedom of Expression webpage, and Ball State's Beneficence Pledge.

In the context of this class, **Freedom of expression** means being able to ask questions, offer ideas, propose new hypotheses or engage in open discussions without judgment. It encourages a healthy learning environment where we grow by experimenting—both in lab and in thought. This freedom fuels innovation and scientific discovery. While chemistry is grounded in fundamental principles, anomalies and unexpected results do occur. Scientists must feel free to explore and publish unconventional ideas if they are supported by **evidence-based research**. Scientific knowledge evolves through debate, experimentation, and replication. Therefore, in chemistry, it is not just about expressing an idea—it is about backing it with data, peer-reviewed studies and logical reasoning. Feel free to search the scientific literature to explore different viewpoints, verify results or expand your own understanding of concepts/techniques covered in this course.

7.3 Attendance: Full performance in the laboratory requires regular and punctual class attendance. Absences and late arrivals will result in point deductions from worksheets, quizzes, and/or reports as listed in section 6.2. Due dates will not be extended unless there are extenuating circumstances which includes.

> *Unexpected injury or illness, any cold/flu symptoms, funeral and bereavement leave, jury duty, late course addition, military absences, observance of religious holidays, pregnancy leave, student-athletes participating in University- or department-approved activities, and university advisories.*

In general, students are expected to notify all their instructors once they anticipate being absent for any reason (e.g.,funeral) or as soon as possible after the absence begins (e.g., unexpected injury or illness). The student may need to provide documentation (with confidential information redacted when appropriate) to each instructor if requested. In these cases, accommodations can, and likely will be made. In most cases, these absences require completion of a make-up lab or a virtual experiment. Completion of the missed experiment via the virtual videos should be pursued as quickly as possible if that is an option. *No worksheet submissions will be accepted for the unexcused absences.*

8. STUDENT SUPPORT SERVICES

Students can benefit from free tutoring and coaching at the Learning Center, mental health assistance at the Counseling Center, and assistance with basic needs at the Basic Needs Hub.

9. CANVAS AND STUDENT PRIVACY

9.1 Canvas Accessibility. Canvas provides a user experience that is easy, simple, and intuitive. Special attention has been paid to making Canvas screen-readable. The Rich Content Editor encourages users to create accessible content pages (i.e. text formatting is accomplished using styles). Canvas is designed to allow limited customization of colors and schemes to be accessible for all users. The National Federation of the Blind granted Canvas the Gold Level Web Certification in 2010. Find more information by visiting the Canvas Voluntary Product Accessibility Template (VPAT).

9.2 FERPA and Privacy. As a student, your educational records are considered confidential. Under FERPA (Family Educational Rights and Privacy Act), your records are confidential and protected. Under most circumstances, your records will not be released without your written and signed consent. However, some directory information may be released to third parties without your prior consent unless a written request to restrict this is on file. You can learn more about student rights to privacy by reading Ball State's FERPA and Privacy and Protection.

10. COURSE EXPECTATIONS AND POLICIES

10.1 Course Participation Expectations

- This course is designed with weekly modules consisting of pre-lab quizzes, experimental videos and plans as well as post-lab worksheets
- It is recommended that you log into your Canvas course 3 to 4 times a week and check your official Ball State email account daily to view announcements and prepare for class.
- Complete all assignments and pre-lab quizzes by the stated due dates on Canvas.

10.2 Feedback Policy

- Your instructor will respond to your email within 24 hours during weekdays (Monday-Friday) and within 48 hours on the weekend (barring unforeseen circumstances).
- Your instructor will typically grade your worksheets within 5 school days of submission (barring unforeseen circumstances).
- Contact your instructor directly if you have questions or concerns about your performance in class.

10.3 Late Assignment Policy

- Assignments posted after the indicated due date will be subject to late penalty as listed in section 6.2.
- Internet connectivity and technical issues may occur and impede you from turning in work on time. Turn in work early and often, and set up a back-up plan, such as visiting a local library or borrowing a peer's computer.

11. SUBJECT TO CHANGE STATEMENT

This syllabus is subject to change in the event of extenuating circumstances.