

CHEM 2551 Syllabus

Laboratory for Organic Chemistry 1

FALL 2024 (Dr. Myers Sections)

Instructor: Dr. Brian Myers
Office: Meyer Hall 256
Phone: 419-772-2350
Email: b-myers@onu.edu
Web pages: <https://myersorganic.netlify.app/>
<http://tinyurl.com/BJMofficehours>

Office Hours: MWF: 10–12. Open door or by appointment (virtual is an option)

CHEM 2551.23 (CRN: 21410) 12:00 PM Tuesday MEYER MY 205/217

CHEM 2551.44 (CRN: 20124) 12:00 PM Thursday MEYER MY 206/218

Catalog Info: Chemistry 2551 is a 1 credit hour course. Basic laboratory techniques used for synthesis, isolation, purification, and analysis of organic compounds are studied in the course. Some functional group interconversion, substitution, and elimination processes are introduced. Structure analysis using spectroscopy. The lab experiments are designed to illustrate practical implementation of the theories and concepts learned in lecture. There is an additional fee for this course. Taken concurrently with CHEM 2511. Credit may be received for CHEM 2551 or 2651, but not for both.

Course Fee: \$40.00

Goals: The lab experiments in this course are designed to illustrate the practical implementation of the theories and concepts discussed in the CHEM 2511 lecture course. The laboratory experiments and exercises will enhance and deepen your understanding of the lecture materials. Student learning objectives/outcomes for each experiment can be located in the lab manual.

Course learning objectives

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

1. Employ safe practices in the laboratory.
2. Utilize a laboratory notebook.
3. Explore physical properties of organic compounds.
4. Utilize standard organic chemistry glassware.
5. Observe some organic reactions.
6. Explore standard spectroscopic characterization methods of organic compounds.

Required Texts:

- *Organic Chemistry Laboratory Experiments and Exercises* (the Lab Manual). 2023 Edition
- Carbonless copy notebook (both sheets are perforated) (ISBN 9781506647401)
- Klein, David, *Organic Chemistry*. 4th ed. (TEXT), Wiley

Required equipment: Safety goggles and appropriate laboratory attire as specified in the Lab Manual under “Lab Attire & Protective Clothing.” Goggles must be brought to lab each week—Not left in your lab drawer.

Requirements: Completion of CHEM 1721 or 1821 with a passing grade. CHEM 2551 is intended to be taken concurrently with CHEM 2511. If you withdraw from CHEM 2511, you must also withdraw from CHEM 2551. In the event that you must withdraw from CHEM 2551, you must arrange a time with your instructor to check-out of your drawer. If you do not check-out of your drawer, a hold will be placed on your university account.

Canvas: Laboratory prelab assignments and supplemental materials will be available online through Canvas. If you have problems accessing the course, please contact the IT helpdesk (x1111). Typically, 2 attempts for each prelab assignment are allowed. **Prelabs must be completed prior to coming to lab.**

Preparedness: The student must complete the notebook table, prelab exercise, and assigned reading prior to the lab period.

Lab notebook: Please refer to the Lab Manual pages 11–13.

Missing Lab/Makeups: In the unlikely event that you are unable to attend lab, you need to let your lab instructor know immediately by email and/or phone. For an excused absence you will need to complete the experiment during a different time. If this is not possible, your laboratory score will be prorated based on your performance during the semester. For an unexcused absence, you will receive zero points for all the graded activities associated with that laboratory period. Three unexcused absences will result in immediate failure of the course.

Cancellation of In-person Instruction: If ONU must cancel in-person class meetings for weather or any other reason, an announcement will be released in the official RAVE email and text. The campus will be told that ONU will be moving to virtual instruction. For this class, you will likely be expected to complete course material asynchronously; please check Email & Canvas. Contact your instructor with any questions or concerns. You may be required to make up any classes cancelled.

Safety: Please be aware that the lab experiments you will complete require the use of toxic substances. Thus, prudent attention to safety practices should be followed at all times. Please make your instructor aware of any medical conditions that might affect your ability to safely complete these experiments.

Grading: The overall grade in the course will be determined by the following point breakdown

| Possible Points | | Grading Scale | |
|---------------------------------------------|-------------------|---------------|--------------|
| Lab Exams (2 x 30 pts each) | 60 | A | 88.0 – 100% |
| Canvas prelab assignments (10 x 5 pts each) | 50 | B | 75.0 – 87.9% |
| Lab reports/worksheets (11 x 20 pts each) | 220 | C | 65.0 – 74.9% |
| Lab Technique | 10 | D | 55.0 – 64.9% |
| Laboratory Final (week 15) | <u>60</u> | Worse | 0 – 54.9% |
| Total | 400 points | | |

Common Course Policies

Ohio Northern University is dedicated to providing an equitable educational experience for all enrolled students.

Universal course policies applicable to all courses can be found at the following link:

https://my.onu.edu/registrar_office/policies. Specifically, this website includes the policies for the following topics:

- Academic Dishonesty Policy
- Academic Accommodations Policy
- ONU Health and Safety Policy
- Title IX Policy
- Diversity, Equity, and Inclusion Language

| Date(s) [§] | Lab Experiment Title | Required Reading (Lab Manual/Text*) |
|----------------------|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| August 27, 29 | Safety lecture, Check-in, Synthesis of Acetaminophen Turn in notebook pages | p. 17 |
| September 3, 5 | Recrystallization & Melting Point Turn in notebook pages | Handout TEXT: 39–41* |
| September 10, 12 | Thin Layer Chromatography (TLC) A paper prelab is due A Canvas prelab is due Turn in notebook pages | p. 29 |
| September 17, 19 | Measurement of Acid Strength A Canvas prelab is due Turn in individual worksheet next week | p. 37 TEXT: 97–124* |
| September 24, 26 | Infrared Spectroscopy A Canvas prelab is due Turn in notebook pages | p. 53 TEXT: 639–658* & see index |
| October 1, 3 | Modeling Lab, EXAM 1 A Canvas prelab is due A worksheet (handed out in lab) will be due | Handout |
| October 8, 10 | Simple and Fractional Distillation A Canvas prelab is due Turn in the worksheet next week | p. 55 TEXT: 36–37, 589, 1059–1060* |
| October 15, 17 | Fall Break—No Lab | |
| October 22, 24 | Nucleophilic Substitution Reactions A Canvas prelab is due Turn in worksheet and notebook pages | p. 65 TEXT: 280–347* |
| October 29, 31 | Extraction I A paper prelab is due A Canvas prelab is due | Handout TEXT: 1062 |
| November 5, 7 | Extraction II A paper prelab is due Turn in worksheet /notebook pages | Handout TEXT: 1062 |
| November 12, 14 | 13C & DEPT NMR Spectroscopy, EXAM 2 A Canvas prelab is due Turn in individual worksheet | p. 93 TEXT: 721–727* |
| November 19, 21 | Proton NMR: Coupling Constants (J_{ab}) A Canvas prelab is due Turn in individual worksheet | p. 99 TEXT: 685–720* |
| November 25–29 | Thanksgiving Break—No Lab | |
| December 3, 5 | Dehydration of Methylcyclohexanol A Canvas prelab is due Turn in notebook pages | p. 105 TEXT: 329–330* |
| December 10, 12 | FINAL Exam & Check Out | |

[§]This is a common schedule for all lab sections. Your lab meets 1 day per week.

*Text = Klein, 4th Edition