Mayville State University

CHEM 342

Organic Chemistry II
Spring 2025
4 S.H.

Course and Instructor Information

Instructor Name: Bob Miess

Contact Information: robert.miess@mayvillestate.edu CB 108C, 34885

Hours of Availability: Monday @ 2 Thursday @ 11, Friday @ 2

Instruction Mode: On-campus face-to-face

Time Zone: All times indicated throughout this syllabus reflect Central Time (CT)

Meeting Times and Location: M, T, W, F 11:00 – 11:50; SB 130

Zoom Link: https://mayvillestate.zoom.us/j/84183601547

Course Materials and Technologies

Required

Organic Chemistry, 2nd Edition (2006), Sorrell TN, University Science Books, Sausalito, CA.

Achieve course identification: 868vzd
You will need access to the course Achieve site for homework assignments.

Internet connectivity to access course materials which will be posted on the Mayville State site using our current learning management system and the electronic homework system.

Recommended

Solutions to Exercises Organic Chemistry, 2nd Edition (2006), Sorrell TN, University Science Books, Sausalito, CA. A copy is on reserve in the Byrnes-Quanbeck Library. See the assistants or the librarians at the checkout desk for help.

Course Description

This course is an introduction to organic chemistry including structure and bonding, nomenclature, stereochemistry, functional groups, and spectroscopy for structure determination.

Pre-/Co-requisites

CHEM 122, General Chemistry II, Organic Chemistry I, CHEM 341, are required as a pre-requisites for this course but may be waived with instructor approval under exigent circumstances.
CHEM 342L, Organic Chemistry II Lab, is a recommended co-requisite for this course. The lab will build on class discussion and provide opportunities to apply and observe topics under discussion.

Course Objectives

The goals of the MSU Science program are to present current information on aspects of the physical world and to develop logical reasoning, sometimes mathematical, relating one process to another. Organic Chemistry II continues to prepare the student to discuss and work with the basic principles of organic chemistry and its relationship to other disciplines as well as to describe different scientific models and how these models are used to stimulate scientific inquiry.

Students who have completed this course should be able to (as aligned to Composite Science Education Program Approval Standards through North Dakota's Education Standards and Practices Board):

1. Apply theories of bonding to reactivity
   - What is a pericyclic reaction? How do molecular orbitals play a part in the reactivity of dienes in the Diels-Alder reaction?
2. Describe aromaticity and its consequences on reactivity.
   - What is aromaticity?
   - How does aromaticity impact physical and chemical properties of these compounds?
2. Identify organic compound structure using spectroscopy.
   - Apply the principles of interpretation of proton NMR, carbon NMR, IR, MS to identify structure.
3. Discuss and apply principles of organometallic chemistry.
   - What is an organometallic compound?
   - How do organometallic compounds generally react? How does this differ from normal reactions of carbon compounds?
4. Demonstrate familiarity with carbonyl compounds
   - What types of carbonyl compounds are commonly encountered?
   - How are carbonyl compounds synthesized?
   - What are the common reactions of carbonyl compounds?

Standards Alignment (Composite Science Education Program Approval Standards-ND ESPB):

- 13047.1 Composite Science Major/General Science The composite/general science program requires that environmental science be incorporated within other courses or as a separate course. The composite/general science program requires:1. Coursework in biology, chemistry, physics, and earth science, including: a. Minimum of twenty four semester hours in one area, b. Minimum of twelve semester hours in two other areas, c. Minimum of four semester hours in the fourth area, d. Courses must be from those that the institution allows toward graduation in the science major. 2. Study of mathematics through the pre-calculus level (college algebra and above) and statistics
- 13047.3 Inquiry The program requires study of the processes of science common to all scientific fields.

Program Student Learning Outcomes (SLOs) Addressed in This Course

The Academic Program Student Learning Outcomes document can be found in the course shell. Following the link leads to a document containing all learning outcomes pertaining to Essential Studies courses and all majors and minors. The document has an index, so you can quickly find the degree you are pursuing. Student learning outcomes are statements of what students should think, know, feel or do when they have completed a program. They are the basis for determining the extent to which program learning goals are being met. They are measurable or identifiable, action-oriented and realistic. Each of the identified Chemistry program student learning outcomes are introduced or re-enforced in this course. Mastery of Content Knowledge (SLO #1) associated with the Organic Chemistry sequence will be assessed in CHEM

476S, Comprehensive Review and Exam, with administration of the American Chemical Society standardized exam as with comparison to national norms.

CHEM 342 is designed to reinforce all the learning outcomes with its associated lectures and activities.

Course Expectations

As a student in this class, you are expected to:

1. Complete assignments in a timely fashion. Late work is unacceptable and will be graded accordingly. If something comes up, let me know as soon as possible and we may be able to make arrangements.
2. Actively participate in the learning process. In order to participate you need to be prepared so that you can ask and answer questions, draw your own conclusions, and think creatively as well as critically. If you do not understand something, speak out. Read the textbook as assigned!
3. Take responsibility for the learning experience of yourself and the other members of the class. You can learn a great deal by working with others. Participate in the discussions and group activities.
4. Attend all class meetings. Absences not only hurt your learning experience, but that of everyone else in the class. You are an integral part of this class. We need you! If you miss a class with a University approved excuse, you will be allowed to make up any missed work. Under such circumstances, please check the class web site for assignments and other important announcements. You are responsible for whatever material was covered in class during your time away!

Instructor/Student Communication

Students are accountable for all academic communications sent to their Mayville State University e-mail address and all information posted on the course Blackboard site.

I will respond to all emails sent Monday – Friday within 24 hours. Weekend emails will be addressed the first day of the next work week, typically by noon.

Assignments and Assessments

Student grades will be based upon your performances in the following areas:

1. Quizzes, which cover the lecture material under discussion, will be assigned in class. The quizzes are given to ensure that you are keeping up with the reading and more importantly that you understand what we are discussing. Quizzes will be administered both via paper.
2. There will be four exams during the semester, approximately every four weeks. These assessments will be designed to address your understanding of the material presented in the text and in class. Most of the exams will generally consist of a section of multiple choice questions, a section of chemical reactions where you will need to supply the major organic product based on the starting compounds and the reaction conditions, a section requiring you to provide a step-wise flow of electrons describing how a given starting material is converted into a given product, and essay response question(s) where you will be required to apply and synthesize the material that has been presented and discussed in class. The second exam will differ from the usual assessment as it involves interpreting sets of spectral data to identify unknown compounds.

3. The Final Exam will be given as an in-class cumulative exam. The Final Exam will be administered during finals week. The Registrar has scheduled the exam period for this semester during class time tentatively on Thursday, May 8, 2025.
4. There will be end-of-chapter problem assignments presented and discussed in class. On those days, it will be important you have access to the text.
5. Chapter homework exercises for each chapter will be available via Achieve.
6. Your attendance will be monitored; unapproved absences will affect your participation score.

Evaluation and Grading

Grading Policies

The final grade will be weighted using the following categories: assignments (at least one for each block 4 – 6), quizzes (one in each block 4), exams (one in each block 4), and participation.

Attendance/Participation Policies

Actively participate in the learning process. To participate you need to be prepared so that you can ask and answer questions, draw your own conclusions, and think creatively as well as critically. If you do not understand something, speak out. Read the textbook as assigned!

Participate in course discussions and group activities.
Your participation in class will be monitored, evaluated, and included as part of your final grade. Participation includes asking and answering questions, working on assignments, etc. By default – attendance will be monitored; unapproved absences will affect your participation score.

Grading Scale

Achieve Homework 20%
Quizzes 20%
Exams 45%
Final 15%

Breakdown of Grades

A > 90%, B > 80%, C > 70%, D > 60%

Enrollment Verification

The U.S. Department of Education requires instructors to conduct an activity which will validate student enrollment in this course. Class attendance will be used to verify enrollment in on-campus courses. If you do not attend, your enrollment in this course will be at risk.

Important Student Information

In the Announcements section of the Blackboard Institution Page, you can view and download the Important Student Information document for the current academic year. It includes information about:

- ✓ Land Acknowledgement Statement
- ✓ Academic Grievance Concerns and Instructor English Proficiency
- ✓ NetTutor - Online Tutoring Program
- ✓ Starfish - Student Success System
- ✓ Students with Documented Disabilities
- ✓ Student Learning Outcomes / Essential Learning Outcomes
- ✓ Academic Honesty
- ✓ Emergency Notification
- ✓ Continuity of Academic Instruction for a Pandemic or Emergency
- ✓ Family Educational Rights and Privacy Act of 1974 (FERPA)
- ✓ Diversity Statement (Title IX)

Course Timeline/Schedule

The following schedule is tentative and can be adjusted by the instructor with prior notice given to students.

Block 1 (Weeks 1 – 3)
Chapter 10 (last part) Pericyclic reactions
Chapter 11 Redox reactions
Chapter 12 Free Radicals

Block 2 (Weeks 4 – 7)
Chapters 13 Nuclear Magnetic Resonance
Chapter 14 Determining Structure

Block 3 (Weeks 8 – 12)
Chapters 15 Organometallics
Chapter 17 Aromatics

Block 4 (Weeks 13 – 16)
Chapters 18 Nucleophilic addition to aldehyde/ketones
Chapter 19 Addition-Substitution reactions Aldehydes/Ketones
Chapter 20 Addition-Elimination reactions Aldehydes/Ketones

Continuity of Academic Instruction for a Pandemic or Emergency

The health and safety of our students, staff, and faculty is our top priority. Mayville State University is committed to continuing face-to-face instruction for on campus courses each semester while minimizing exposure risk and promoting health and safety for students, faculty, and staff.

If there is a significant health or safety event that necessitates a change in course format, plans for remote options for this course include continuation of asynchronous class meetings.