MISSISSIPPI COLLEGE
A CHRISTIAN UNIVERSITY

Advanced Organic Chemistry

CHE 402 & CHE 5402 | Fall 2025
Total Credit Hours: 4 hrs
Classroom: MCC 402
Meeting time: T,R 8:00-9:15 a.m.

Instructor

Dr. Trent Selby
Associate Professor
Email Address: selby@mc.edu
Contact: Email
Office Location: Hederman Science Building 407 (Phone: (601) 925-7665)
Office Hours: MWF 10:00-11:00; TR 9:30-11:00; or by appointment

Course Description

Reactions and mechanisms, separation science, serial synthesis and instrumental methods of compound identification. This course includes a study of selected topics in physical organic chemistry.

Rationale for Course

This course will provide an in-depth understanding of organic chemical compounds and principles and how they are involved in everyday life as well as in advanced chemical studies.

Learning Objectives

The objectives of this course are to provide the student with the necessary knowledge and experience to be able to:

1. understand structural theory as it relates to organic compounds.
2. relate structure and nomenclature of compounds.
3. predict shapes of molecules, physical properties, and chemical properties of compounds when given the formulas of compounds.
4. visualize the three-dimensional structure of molecules and relate it to stereochemistry.
5. predict the type of mechanism involved from the nature of the reactants and reaction conditions.
6. understand the mechanism and stereochemistry of organic reactions.

Prerequisites

Prerequisite: A passing grade in CHE303 and CHE304.

Instructional Materials

(optional) "Perspectives on Structure and Mechanism in Organic Chemistry"
By Felix A. Carroll (Wiley; 2nd edition) ISBN 978-470-27610-5

Other Reference Books: 1. "Advanced Organic Chemistry; Part A: Structure and Mechanisms"
by Francis A. Carey and Richard J. Sundberg.
2. "Mechanism and Theory in Organic Chemistry"
by Thomas H. Lowry and Kathleen Richardson

Tenative list of topics to be covered in this course:

⇒Resonance
⇒MO Theory
⇒Stereochemistry & Conformational Analysis
⇒Pericyclic Reactions
⇒Art of writing Organic Mechanisms
⇒Free Radicals & Carbenes
⇒Overview of Organic Photochemistry
⇒Thermochemistry
⇒Kinetics
⇒Linear Free Energy Relationships
⇒H/D Isotope Effects
⇒Acid/Base Chemistry
⇒Solvent Effects
⇒Named Organic Reactions

Methods of Instruction

Classes will consist primarily of lecture and problem solving. Required attendance either in- person or virtually via Zoom (Meeting ID: 975 881 1142 Password: organic).

Methods of Evaluation

There will be two exams given, a semi-comprehensive final exam, and laboratory points.

MC Syllabus Statement

The MC Syllabus contains all policies and procedures that are applicable to every course offered by Mississippi College, both on campus and online. The policies in the MC Syllabus describe the official policies of the University as they relate to instruction and will take precedence over those found elsewhere. It is the student's responsibility to read and be familiar with every policy. The MC Syllabus may be accessed at any time on the MC website at the following: https://www.mc.edu/provost/mcsyllabus.

Grading Policy

Exams : (tentative exam dates):

Exam 1 (150 pts): **Monday, Sept. 22**
Exam 2 (150 pts): **Monday, Oct. 20**
Semi-Comprehensive Final (200 pts): **Tuesday, Dec. 9** (8:00–11:00 a.m.)
Labs (50pts total)

Graduate students (CHE5402): A three-page term paper is required on a topic chosen by the student and approved by Dr. Selby. (50 pts)

Grading: (note: a grading curve may be used, at my discretion, to achieve a fair distribution of grades)

(as percentages of all points) 89.5-100% (A); 79.5-89.4% (B); 69.5-79.4% (C); 59.5-69.4% (D); below 59.4% (F).

The last day to drop a class without receiving a grade is Friday October 24, 2025.

Academic Integrity: Mississippi College students are expected to be completely honest in all aspects of the course. Dishonesty, such as cheating or plagiarism, will not be tolerated and will be dealt with according to the stated policies of the university. For details, see the current *Mississippi College Undergraduate Catalog*, the *Tomahawk*, and Policy 2.19.

Additional Course Policies

Your attendance at all class meetings is expected. Please refer to the *Mississippi College Undergraduate Bulletin* or to the *Mississippi College Graduate Catalog* for a discussion of the university's attendance policy. If a regular class meeting is missed, it is the student's responsibility to obtain any assignments or instructions that were given by the instructor. Missing a class is **not** an excuse for not preparing for the next class meeting or not having an assignment ready on time.

Students with disabilities needing accommodations should contact Student Accessibility Services, Nelson Hall, basement, Telephone: 601.925.3852 or email: accessibility@mc.edu. Additional information regarding policy and procedures can be found on the Mississippi College Website at https://www.mc.edu/offices/accessibility-services/

Best Practices

A. Practice. Work the homework problems given in class.

B. Student Alert System

Mississippi College has adopted the practice of finding students early in the semester who may be exhibiting behaviors that could ultimately have a negative impact on their academic progress. These behaviors are often called "red flag" behaviors and include, but are not limited to, excessive absences, poor test grades, and lack of class participation or evidence of non-engagement. Identifying these behaviors early gives the instructor the opportunity to raise the "red flag" on behalf of a particular student so that the student can take the appropriate action to redirect his/her progress. The system alerts the student, the student's advisor, and the Office of Student Success.

Disclaimer

The instructor reserves the right to modify the schedule proposed in the syllabus as necessary. Modifications will be provided in writing.