



湖北工業大學
HUBEI UNIVERSITY OF TECHNOLOGY

Course Title	Organic Chemistry I
Course Code	CHEM 2021
Semester	Summer 2026
Course Length	4 Weeks, 60 Contact Hours
Credits	4
Instructor	TBA
Office	TBA
Email	TBA
Prerequisite	CHEM 1111 General Chemistry I

Course Description:

Organic Chemistry I is the first course in Organic Chemistry exploring the structure, bonding, reactivity, and physical properties of carbon-containing compounds. This course introduces key concepts in organic structure representation, acid-base behavior, conformational and stereochemical analysis, and mechanistic understanding of organic reactions. Topics include hydrocarbons, functional groups, substitution and elimination reactions, radical mechanisms, and the foundational techniques of synthetic design. The course also introduces the use of infrared (IR) and mass spectrometry (MS) for molecular analysis.

Topics covered:

- Introduction and Review of General Chemistry Concepts
- Drawing Organic Molecules and Resonance Structures
- Acids and Bases in Organic Chemistry
- Structure and Properties of Alkanes and Cycloalkanes
- Conformational and Stereochemical Analysis
- Introduction to Reaction Mechanisms and Energetics
- Nucleophilic Substitution and Elimination (SN1, SN2, E1, E2)
- Reactions of Alkyl Halides
- Structure, Reactions, and Mechanisms of Alkenes and Alkynes
- Radical Reactions and Polymerization
- Principles of Organic Synthesis and Reaction Planning
- Structure and Reactivity of Alcohols and Ethers
- Fundamentals of IR and Mass Spectrometry

Course Goals:

Students who successfully complete this course will demonstrate competency in the following general education core goals:

- **Critical thinking skills** – Students will engage in creative and/or innovative thinking, and/or inquiry, analysis, evaluation, synthesis of information, organizing concepts, and constructing solutions.
- **Communication skills** – Students will demonstrate effective written, oral, and visual communication.
- **Teamwork** – Students will demonstrate the ability to work effectively with others to support a shared purpose or goal and consider different points of view.
- **Social responsibility** – Students will demonstrate intercultural competency and civic knowledge by engaging effectively in local, regional, national, and global communities.

Student Learning Outcomes:

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

- Draw and interpret Lewis structures, resonance forms, and curved-arrow mechanisms;
- Identify and analyze acid-base reactions using pKa values and structural features;
- Predict conformational stability and describe stereoisomerism in organic molecules;
- Propose mechanisms and products for substitution, elimination, and addition reactions.;
- Apply principles of radical chemistry in organic synthesis;
- Use IR and MS data to identify functional groups and molecular masses.

Textbooks/Supplies/Materials/Equipment/ Technology or Technical Requirements:

Primary Text:

Organic Chemistry, David R. Klein, 4th ed. Wiley.

Student Study Guide and Solutions Manual for Organic Chemistry, Klein, 4th ed. Wiley.

Optional:

Organic Chemistry, L.G. Wade, 8th ed. Pearson.

Course Requirements:

Participation and Discussion Engagement (10%):

This component evaluates students' active and constructive involvement in both lecture and designated discussion sessions. Students are expected to arrive prepared, contribute meaningfully to in-class questions and problem-solving, and engage respectfully in peer discussions. Participation will be graded on consistent attendance, quality of contributions during group work and Q&A segments.

Homework (15%)

Students will complete problem sets to reinforce lecture concepts. Each assignment is due before the next topic is introduced. One lowest score will be dropped.

Quizzes (10%):

Short, periodic quizzes will be administered throughout the term to reinforce key concepts and provide timely feedback on student understanding. Quizzes will typically be held at the start of class and will cover recent lecture topics and assigned

readings. Format may include multiple-choice, short-answer, and mechanism-drawing questions.

Midterm Exams (20%*2=40%)

Two midterm exams will be held throughout the semester and will include multiple-choice, short-answer, and mechanism-based questions. Each midterm covers material from previous lectures.

Final Exam (25%)

The final exam is comprehensive, covering all course topics. Emphasis is placed on mechanism prediction, synthesis design, and structure analysis.

Assessments: Activity	Percent Contribution
Participation and Discussion Engagement	10%
Homework	15%
Quizzes	10%
Midterm Exams (2)	40%
Final Exam	25%

Grading:

Final grades will be based on the sum of all possible course points as noted above.

Grade	Percentage of available points
A	94-100
A-	90-93
B+	87-89
B	84-86
B-	80-83
C+	77-79
C	74-76
C-	70-73
D	64-69
D-	60-63
F	0-59

Course Schedule:

The schedule of activities is subject to change at the reasonable discretion of the instructor. Minor changes will be announced in class, major ones provided in writing.

CHEM 2021 Schedule		
Lecture	Topic	Readings
L1	Course Overview; General Chemistry Review	Ch. 1
L2	Drawing Molecules: Bond-line, Lewis, and Resonance	Ch. 2
L3	Resonance and Formal Charges	Ch. 2
L4	Acids and Bases in Organic Chemistry	Ch. 3
L5	Factors Affecting Acidity and Basicity	Ch. 3
L6	Structure and Properties of Alkanes	Ch. 4
L7	Cycloalkanes and Conformational Analysis	Ch. 4
L8	Introduction to Stereochemistry	Ch. 5

L9	Enantiomers, Diastereomers, and Chiral Centers	Ch. 5
L10	Optical Activity and Resolution of Enantiomers	Ch. 5
/	Midterm Exam #1	/
L11	Chemical Reactivity: Thermodynamics and Kinetics	Ch. 6
L12	Reaction Mechanisms and Energy Diagrams	Ch. 6
L13	Introduction to Alkyl Halides	Ch. 7
L14	SN2 and SN1 Reactions	Ch. 7
L15	E2 and E1 Reactions and Competition	Ch. 7
L16	Alkenes: Structure and Properties	Ch. 8
L17	Electrophilic Addition Reactions of Alkenes	Ch. 8
L18	Alkynes: Nomenclature and Reactions	Ch. 9
L19	Addition Reactions of Alkynes	Ch. 9
/	Midterm Exam #2	/
L20	Radical Reactions and Polymer Chemistry	Ch. 10
L21	Multistep Synthesis: Retrosynthesis and Design	Ch. 11
L22	Structure and Reactions of Alcohols	Ch. 12
L23	Synthesis and Reactions of Ethers	Ch. 13
L24	IR and Mass Spectrometry	Ch. 14
L25	Final Review	Ch. 1-14
/	Final Exam (Cumulative)	/

Accommodation Statement

Academic accommodations may be made for any student who notifies the instructor of the need for an accommodation. It is imperative that you take the initiative to bring such needs to the instructor's attention, as he/she is not legally permitted to inquire. Students who may require assistance in emergency evacuations should contact the instructor as to the most appropriate procedures to follow.

Academic Integrity Statement

Each student is expected to maintain the highest standards of honesty and integrity in academic and professional matters. The University reserves the right to take disciplinary action, up to and including dismissal, against any student who is found guilty of academic dishonesty or otherwise fails to meet the standards. Any student judged to have engaged in academic dishonesty in coursework may receive a reduced or failing grade for the work in question and/or for the course.

Academic dishonesty includes, but is not limited to, dishonesty in quizzes, tests, or assignments; claiming credit for work not done or done by others; hindering the academic work of other students; misrepresenting academic or professional qualifications within or without the University; and nondisclosure or misrepresentation in filling out applications or other University records.

Other Items:

Attendance and Expectations

All students are required to attend every class, except in cases of illness, serious family concerns, or other major problems. We expect that students will arrive on time, be prepared to listen and participate as appropriate, and stay for the duration of a meeting rather than drift in or out casually. In short, we anticipate that students will

show professors and fellow students maximum consideration by minimizing the disturbances that cause interruptions in the learning process. This means that punctuality is a must, that cellular phones be turned off, and that courtesy is the guiding principle in all exchanges among students and faculty. You will be responsible for the materials and ideas presented in the lecture.

Assignment Due Dates

All written assignments must be turned in at the time specified. Late assignments will not be accepted unless prior information has been obtained from the instructor. If you believe you have extenuating circumstances, please contact the instructor as soon as possible.

Make-Up Work

The instructor will not provide students with class information or make-up assignments/quizzes/exams missed due to an unexcused absence. Absences will be excused and assignments/quizzes/exams may be made up only with written documentation of an authorized absence. Every effort should be made to avoid scheduling appointments during class. An excused student is responsible for requesting any missed information from the instructor and setting up any necessary appointments outside of class.

Access, Special Needs and Disabilities

Please notify the instructor at the start of the semester if you have any documented disabilities, a medical issue, or any special circumstances that require attention, and the school will be happy to assist.