Master Course Syllabus

For additional course information, including prerequisites, corequisites, and course fees, please refer to the Catalog: https://catalog.uvu.edu/

Semester: Spring
Year: 2025
Course Prefix: CHEM
Course and Section #: 2320-002
Course Title: Organic Chemistry II
Credits: 4

Course Description

CHEM 2320 is the second in a series of two semester Organic chemistry classes. Introduces spectroscopic techniques used in identification of organic compounds. Teaches carbon-carbon bond formation strategies. Introduces the concept of aromaticity. Teaches free radicals and their effects on environment and life. Surveys biologically important organic molecules such as carbohydrates, proteins, lipids, and nucleic acids.
For this **four (4) credit-hour** course students should expect to spend up to **12+ hours a week** completing course activities

Course Attributes

This course has the following attributes:
☐ General Education Requirements
☐ Global/Intercultural Graduation Requirements
☐ Writing Enriched Graduation Requirements
☒ Discipline Core Requirements in Program
☒ Elective Core Requirements in Program
☐ Open Elective
Other: *Click here to enter text.*

Instructor Information

Instructor Name: Dr. Young Wan Ham

Student Learning Outcomes

Upon successful completion, students should be able to:

- Explain the relationship between molecular structure and function, using intra- and intermolecular forces and their influences on the physical properties of organic molecules
- Illustrate organic molecules and organic reaction in three dimension
- Identify what qualities of acid, base, nucleophile, or electrophile that make it strong or weak
- Propose plausible arrow-pushing mechanisms to illustrate electron flow during organic chemical reactions, such as addition, substitution, elimination, rearrangement, oxidation, reduction, condensation, pericyclic reactions
- Explain what factors govern the stereo-, regio-, and chemoselectivity of organic reactions

- Evaluate the relative stability among competing intermediates and transition states in organic reactions using energy and reaction coordinate diagrams
- Apply the basic concepts of synthetic organic chemistry, including retrosynthetic analysis, to propose and evaluate the preparation of organic molecules in fewer than ten steps from simple starting materials
- Use Infrared, Ultraviolet, and Nuclear Magnetic Resonance spectroscopy and Mass Spectrometry to identify functional groups in organic molecules, to differentiate similar molecules, and to predict the outcome of organic chemical reactions
- Relate how organic chemistry topics are relevant in the real world

Course Materials and Texts

- *Organic Chemistry*, 4th ed. by David R. Klein (Inclusive access through WileyPlus)
- Computer with internet connection **(*laptop computers with webcam are available for you to check out free of charge until the end of the semester. Please visit 1st floor desk at UVU Fulton library*)**
- Course lecture videos and blank lecture note outline are available in Canvas.

Course Requirements

Course Assignments, Assessments, and Grading Policy

Course Requirements	***Raw Score***
A. Lecture Note Outline (14 x 5 pts each)	*70*
B. Chapter-End Questions (14 x 5 pts each)	*70*
C. Organic Chemistry in Real Life Assignments	*50*
D. Quizzes (Total 14 quizzes, 10 pts each) (Four lowest scored quizzes will be dropped and only 10 highest scored quizzes will be counted)	*100*
E. In-Class Quiz (14 x 10 pts) (Total 140 pts will be converted to 100 point basis)	*100*
F. Midterm exams (3 x 100 pts)	*300*
G. Final exam (2 x100 pts)	*200*
H. Drop the lowest among C - G	*-100*
Total Possible Points	***790***

The following grading standards will be used in this class: ***This scale represents total points after curve.***

Grade	Total Point (out of 790)
A	755 - 790
A-	730 - 754
B+	705 - 729

B	680 - 704
B-	655 - 679
C+	630 - 654
C	605 - 629
C-	580 - 604
D	550 - 579
E	<550

*At the discretion of the instructor, grades for the course may be curved higher. One overall curve will be applied at the **end** of the semester when students have completed all requirements. Therefore, the overall grade percentage you will see in canvas grade is approximation, since one lowest scored exam is yet to drop and the curve has yet to be applied as well. Please see the Grading Scale located at the end of the syllabus for letter grade distribution.*

Required or Recommended Reading Assignments
Klein book chapters 14 - 22

General Description of the Subject Matter of Each Lecture or Discussion

- WEEK 1. InfraRed Spectroscopy & Mass Spectrometry (Chapter 14)
- WEEK 2. Nuclear Magnetic Resonance (NMR) Spectroscopy (Chapter 15 1/2)
- WEEK 3. Nuclear Magnetic Resonance (NMR) Spectroscopy (Chapter 15 2/2)
- WEEK 4. Conjugated Pi Systems and Pericyclic Reactions (Chapter 16)
- WEEK 5. Aromatic Compounds (Chapter 17)
- WEEK 6. Aromatic Substitution Reactions (Chapter 18)
- WEEK 7. Introduction to Organometallic Compounds (Chapter 23)
- WEEK 8. Aldehydes and Ketones (Chapter 19 1/2)
- WEEK 9. Aldehydes and Ketones (Chapter 19 2/2)
- WEEK 10. Carboxylic Acids and Their Derivatives (Chapter 20 1/2)
- WEEK 11. Carboxylic Acids and Their Derivatives (Chapter 20 2/2)
- WEEK 12. Alpha Carbon Chemistry: Enols and Enolates 1/2 (Chapter 21 1/2)
- WEEK 13. Alpha Carbon Chemistry: Enols and Enolates 1/2 (Chapter 21 3/2)
- WEEK 14. Amines (Chapter 22)
- Final comprehensive Exam

Required Course Syllabus Statements

Generative AI
This course requires you to complete assignments that assess your understanding, application, and problem-solving ability applied to chemistry. You are expected to do your own work. Problem solving and scientific thinking are tools that are necessary for students to learn in this course. The use of artificial intelligence (AI) tools, such as chatbots, text generators, paraphrasers, summarizers, or solvers,

is strictly prohibited for any part of your assignments. Using these tools will be considered academic dishonesty and will be handled according to the university's academic honesty policy. If you have questions about acceptable use of AI tools, please consult the instructor before submitting your work.

Using Remote Testing Software

☐ This course does not use remote testing software.

☒ This course uses remote testing software. Remote test-takers may choose their remote testing locations. Please note, however, that the testing software used for this may conduct a brief scan of remote test-takers' immediate surroundings, may require use of a webcam while taking an exam, may require the microphone be on while taking an exam, or may require other practices to confirm academic honesty. Test-takers therefore shall have no expectation of privacy in their test-taking location during, or immediately preceding, remote testing. If a student strongly objects to using test-taking software, the student should contact the instructor at the beginning of the semester to determine whether alternative testing arrangements are feasible. Alternatives are not guaranteed.

Required University Syllabus Statements

Accommodations/Students with Disabilities

Students needing accommodations due to a permanent or temporary disability, pregnancy or pregnancy-related conditions may contact UVU Accessibility Services at accessibilityservices@uvu.edu or 801-863-8747.

Accessibility Services is located on the Orem Campus in BA 110.

Deaf/Hard of Hearing students requesting ASL interpreters or transcribers can contact Accessibility Services to set up accommodations. Deaf/Hard of Hearing services can be contacted at DHHservices@uvu.edu

DHH is located on the Orem Campus in BA 112.

Academic Integrity

At Utah Valley University, faculty and students operate in an atmosphere of mutual trust. Maintaining an atmosphere of academic integrity allows for free exchange of ideas and enables all members of the community to achieve their highest potential. Our goal is to foster an intellectual atmosphere that produces scholars of integrity and imaginative thought. In all academic work, the ideas and contributions of others must be appropriately acknowledged and UVU students are expected to produce their own original academic work.

Faculty and students share the responsibility of ensuring the honesty and fairness of the intellectual environment at UVU. Students have a responsibility to promote academic integrity at the university by not participating in or facilitating others' participation in any act of academic dishonesty. As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, assessments, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Likewise, instructors are responsible to clearly state expectations and model best practices.

Further information on what constitutes academic dishonesty is detailed in UVU Policy 541: *Student Code of Conduct*.

Equity and Title IX

Utah Valley University does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation, gender identity, gender expression, age (40 and over), disability, veteran status, pregnancy, childbirth, or pregnancy-related conditions, citizenship, genetic information, or other basis protected by applicable law, including Title IX and 34 C.F.R. Part 106, in employment, treatment, admission, access to educational programs and activities, or other University benefits or services. Inquiries about nondiscrimination at UVU may be directed to the U.S. Department of Education's Office for Civil Rights or UVU's Title IX Coordinator at 801-863-7999 – TitleIX@uvu.edu – 800 W University Pkwy, Orem, 84058, Suite BA 203.

Religious Accommodation

UVU values and acknowledges the array of worldviews, faiths, and religions represented in our student body, and as such provides supportive accommodations for students. Religious belief or conscience broadly includes religious, non-religious, theistic, or non-theistic moral or ethical beliefs as well as participation in religious holidays, observances, or activities. Accommodations may include scheduling or due-date modifications or make-up assignments for missed class work.

To seek a religious accommodation, a student must provide written notice to the instructor and the Director of Accessibility Services at accessibilityservices@uvu.edu. If the accommodation relates to a scheduling conflict, the notice should include the date, time, and brief description of the difficulty posed by the conflict. Such requests should be made as soon as the student is aware of the prospective scheduling conflict.

While religious expression is welcome throughout campus, UVU also has a specially dedicated space for meditation, prayer, reflection, or other forms of religious expression.