

Course Syllabus

Chemistry 2310 (Section 001) – Organic Chemistry I – Fall 2019

Instructor Contact Information:

Dr. Bradley S. Davidson

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The instructor will communicate with students mainly in class and using the Canvas Announcements tools. For further communication, the preferred method is email, either directly or through Canvas. Please put "CHEM 2310-1" in the subject line of any emails. You will typically receive a response within 24 to 48 hours. However, please allow an entire business day before emailing again on the same question or issue. Emails sent on Saturday or Sunday will receive a reply by Monday or Tuesday. Please do not expect to receive emails from your instructor late at night or on Saturdays or Sundays.

All times listed in this syllabus refer to the mountain time zone. As such, all due dates and times will be in mountain time.

Meeting Time/Place: MWF 10:30 – 11:20 AM, EBB 215; R 3:30 – 4:20 PM, LSB 133

Office Hours: M 2:00 – 3:00 PM; T 2:00 – 4:00 PM; F 2:00 – 3:00 PM

Support Staff:

SI Leader: Tyler Perkes (tperkes@aggiemail.usu.edu (<mailto:tperkes@aggiemail.usu.edu>))

Undergraduate Teaching Fellows:

Porter Ellis (pkreyellis@aggiemail.usu.edu (<mailto:pkreyellis@aggiemail.usu.edu>))

Mark Mortensen (mark.mortensen@aggiemail.usu.edu (<mailto:mark.mortensen@aggiemail.usu.edu>))

Tyler Stevens (tylerwstevens99@gmail.com (<mailto:tylerwstevens99@gmail.com>))

Course Description:

This is the first course of a two-semester sequence covering the chemistry of organic chemicals. Students will gain an understanding of the physical properties, nomenclature, stereochemistry, and chemical reactivities of organic molecules, and will be able to describe chemical reactions and step-wise reaction

mechanisms.

Course Learning Objectives:

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

1. Describe atomic and molecular structure and bonding, and properly illustrate organic molecules as Lewis, Kekulé, and skeletal structures.
2. Classify organic compounds by structure, employ IUPAC rules for naming, and identify conformational effects in organic compounds.
3. Predict chemical properties for various compounds, on the basis of their structures.
4. Identify the types of isomerism in organic compounds, recognize and classify chiral centers, and compare the differences in chemical and physical properties among these molecules.
5. Apply concepts of resonance and inductive effects to predict the chemical and physical properties for different functional groups and the reactivity of molecules containing these functional groups.
6. Draw and interpret reaction coordinate diagrams, relate the energetic changes associated with chemical reactions to equilibrium constants and rate, and differentiate kinetic versus thermodynamic control of reactions.
7. Propose electron-pushing mechanisms for chemical reactions, and use the concepts of resonance effect, inductive effect, steric hindrance, leaving group effect, nucleophilicity, and solvation to explain the chemo-, regio-, and stereoselectivity of the reactions.
8. Identify aromatic and antiaromatic compounds and discuss the chemical consequences of aromaticity.
9. Compose multi-step syntheses of organic molecules using a sequence of chemical reactions.

***[Detailed learning objectives](#) are provided for each chapter.

Course Prerequisites:

Coursework prerequisite: CHEM 2310

Technology: You must have a computer with reliable high speed internet access to complete this course. Late assignments will not be accepted because of unreliable internet access.

- You will need Microsoft Office applications (Word, Power Point, and Excel), Adobe Acrobat, or a PDF viewer to open some of the course materials.
- If you do not have a computer at home with the necessary software or high speed internet access, use the computers available to you on campus.
- Please check your browser at the beginning of each semester and download appropriate software and plugins.

The [Technical Requirements](https://community.canvaslms.com/docs/DOC-10720-67952720329) [_ \(https://community.canvaslms.com/docs/DOC-10720-67952720329\)](https://community.canvaslms.com/docs/DOC-10720-67952720329) page identifies the browsers, operating systems, and plugins that work best with Canvas. If you are new to

Canvas quickly review the [Canvas Student Orientation \(https://resources.instructure.com/courses/32\)](https://resources.instructure.com/courses/32) materials.

Materials:

- eText: Smith and Vollmer-Snarr Organic Chemistry with Biological Topics, 5th ed.; McGraw-Hill Education, Inc. (ISBN: 978-1-259-92001-1)

This course requires all-inclusive digital materials that are provided to you at a significantly lower price than traditional printed materials. These materials are paid for through your student tuition/fee account and are accessed through the Canvas course site. You may choose to opt-out of the all-inclusive materials and associated charges, but you will lose access to the required materials, which will have a negative effect on your performance in the course. [Opt-out requests \(HTTPS://PORTAL.VERBA.IO/USU/LOGIN\)](#) must be submitted by Sept. 16, 2019 at 11:59 pm Mountain Time, after which you will also be responsible for obtaining the required materials through your own means.

- Solution Manual for Organic Chemistry w/Biological Topics eBook, 5e – Auto Access eBook:

This course requires all-inclusive digital materials that are provided to you at a significantly lower price than traditional printed materials. These materials are paid for through your student tuition/fee account and are accessed through the Canvas course site. To access, either visit:

<https://portal.verba.io/usu/login> (<https://portal.verba.io/usu/login>), or follow the link to VitalSource Book-shelf in the left menu.

- iClicker (optional for extra credit)
- Molecular model kit (optional-Chemistry Stores)

Tentative Course Outline and Exam Schedule:

<u>Week</u>	<u>Dates</u>	<u>Homework</u>	<u>Chapter(s)</u>
one	8/26 – 8/30	Pre-test Review	Introduction, Chapter 1
two	9/4– 9/6 (no class 9/2)	1	Chapter 1, Chapter 2
three	9/9 – 9/13	2	Chapter 3
four	9/16 – 9/20		Chapter 4

five	9/23 – 9/27	3	Exam 1 (9/23), Chapter 5
six	9/30 – 10/4	4	Chapter 5, Chapter 6
seven	10/7 – 10/11	5	Chapter 6, Chapter 7
eight	10/14 – 10/17 (no class 10/18)	6	Chapter 7
nine	10/21 – 10/25		Chapter 8
ten	10/28 – 11/1		Exam 2 (10/28), Chapter 9
eleven	11/4 – 11/8	7	Chapter 9
twelve	11/11 – 11/15	8	Chapter 10
thirteen	11/18 – 11/22		Exam 3 (11/18), Chapter 11
fourteen	11/25 (no class 11/27-11/29)	9	Chapter 11
fifteen	12/2 – 12/6	10	Chapter 12
sixteen	12/13		Final Exam (9:30 AM – 11:20 AM)

*Materials from these chapters will only be briefly introduced.

Procedures:

- Exams: The exams are meant to test your *understanding* of the topics covered in lecture, not your ability to repeat memorized problems. Expect some questions that require you to *apply* your understanding to new problems. Ultimately, because you are in this course to *learn* organic chemistry, exams are meant to offer *learning opportunities*.

Each midterm exam will include two parts: 1) four free-response questions (100 pt), requiring you to draw structures and justify your answers. This part will be completed in class on the day specified. 2) 25 multiple-choice questions, each worth 4 points (100 pt total) that must be taken on your own time at the [USU testing center](http://testing.usu.edu/) (<http://testing.usu.edu/>). A three day window will be allotted. During the testing window, exam-relevant discussions between students who have completed the exam and those who

have not will be considered cheating.

A *self-correcting* approach will be used for the midterm exams. Without knowing which answers you got right or your score, you will have the opportunity, after consulting your notes, textbook, even classmates, to repeat the on-line portion of the exam, revising your answers. Your score for the multiple choice portion of the exam will be the average of the two attempts. Your exam score will be the sum of the multiple choice score and the free-response score.

There will be no planned make-up exams. It is possible to take an exam in advance, but only with a valid excuse and prearrangement with me. If you miss an exam without prearrangement, then you will receive a zero.

Addition mistakes or questions over exam grading should be discussed with me within one week following the return of the exam. No point adjustments will be made after this time.

- Assignments: There will be three types of assignments.

LearnSmart reading and in-chapter problems. As you read the assigned pages in the eText, you will periodically be asked questions to demonstrate your comprehension. The number and type of questions that you are asked will depend on your responses. If your responses demonstrate that you understand the topic, you will be sent back for more reading. If your responses show a lack of understanding, you will be presented with additional questions to help you increase your grasp of the content. Each LearnSmart assignment is worth 20 pt, awarded for completion. All LearnSmart assignments are due at 10:30 AM on the first day of the Exam with which their chapters are associated.

Practice problems. These problems, administered through McGraw-Hill Connect, will all be multiple choice. You will have an unlimited number of attempts at each homework assignment before the closing date. Practice problems are worth 10 pt, and only the best score will be counted. After the closing date practice problems will be opened for ungraded practice.

Application problems. These problems, also administered through McGraw-Hill Connect, will be a combination of structure drawing, matching, and fill-in. You will have an unlimited number of attempts at each homework assignment before the closing date. Application problems are worth 10 pt, and only the best score will be counted. After the closing date practice problems will be opened for ungraded practice.

Practice and Application problems will be assigned on a weekly schedule, opening at 11:30 AM on Monday through 10:30 AM the following Monday. There are several types of assistance provided, which can be used as you complete the assignments:

eBook and resources: Clicking on the eBook Link icon within a question will show you relevant readings. There is no point penalty for using this.

Hint: The View Hint link will offer a direct suggestion but incurs a 5% deduction from the question score (the deduction is only applied once per question).

Check my work: You can click the “check my work” icon to see if your answer is correct before

submitting it for grading. This can only be used once per question.

- iClicker Questions: We will be using the iClicker Cloud classroom polling system in order to make our class time more engaging. This will help me understand what you know, give everyone a chance to participate, and increase how much you learn when we are in class together. This will also provide you with feedback on how well you are comprehending course concepts and help you master challenging concepts.

Participating in iClicker questions will earn extra credit. Questions will be asked at random times during lecture. Correct responses will be worth 2 pt, while incorrect answers will score 1 pt. During the semester, a maximum of 20 pt may be counted towards your grade.

To earn extra credit, you will need to bring a device to class to answer the iClicker questions. Two options exist: 1) participation with the iClicker Reef app on a smartphone, tablet, or laptop or 2) participation with an iClicker remote. It is your responsibility to set up an iClicker Reef account and, if using an iClicker remote, register it in a timely fashion. It is also your responsibility to regularly check your iClicker records for any discrepancies and bring them to my attention.

In order to participate in the iClicker questions and ensure that your grades are properly reflected in the gradebook, please [follow these instructions](#).

- Extra Credit: For each exam, a "Molecule of Interest" will be posted. An extra credit question pertaining to a "Molecule of Interest" worth 5 pt will be offered on each exam. There is also a pre-test and a Connect introduction exercise, to help you learn the Connect system. Each is worth 5 points. When combined with the possible iClicker points, there will be a total 50 possible extra credit points this semester.
- Class Notes: Pre-lecture notes for each chapter will be posted on this website prior to class. Annotated post-lecture notes, as well as lecture recordings will then be available subsequently.
- Assessment: Assessment involves measuring student progress as well as teaching effectiveness. The following assessment strategies have been incorporated into this course.
 - A pre-test/post-test approach will be used to measure comprehension and teaching of important concepts. The pre-test will be administered through Canvas and must be taken on your own time. The ten multiple choice questions of the pre-test will reappear in the final, in slightly altered form, to assess teaching and learning progress during the semester. If weaknesses are observed in specific subject areas, teaching methods will be reevaluated. If you take the pre-test, you will receive 5 points.
 - Standardized questions: A further measure of teaching efficacy will be obtained by embedding appropriate questions from the American Chemical Society (ACS) standardized exam on Organic Chemistry into the final exam. This will allow class results to be compared to national standards.
 - IDEA Evaluations: Student evaluations will be used to evaluate course/instructor strengths and weaknesses. Constructive suggestions are welcome anytime. The on-line IDEA evaluation system provides a way for you to self-assess how well the course has helped you achieve the following general

objectives.

- Have you gained factual knowledge about Organic Chemistry, including terminology, methods, and trends, as further described in the Detailed Learning Objectives, shown below?
- Have you learned fundamental principles, generalizations, and theories that describe and explain chemical reactions and chemical properties?
- Have you further developed your ability to analyze and critically evaluate ideas, arguments, and scientific models.

Grading Scheme:

Three one-hour exams (3 x 200 pt)	600 pt
Best eleven out of twelve LearnSmart assignments (11 x 20 pt)	220 pt
Best nine out of ten Practice Problems (9 x 10 pt)	90 pt
Best nine out of ten Application Problems (9 x 10 pt)	90 pt
Comprehensive Final (300 pt)	300 pt
Total Points:	1300 pt

Grade Breakdown:

The grade received in the course is based on your performance on the exams and homework. Grades are guaranteed as given below for overall percentage score on all exams. Actual grade ranges may be curved somewhat lower, depending on the overall class average.

A, A-	89% or higher
B+, B, B-	78% or higher
C+, C, C-	66% or higher
D+, D	53% or higher

Other Important Details and Suggestions:

- Try not to simply memorize. You will be more successful if you strive to understand the underlying principles.
- Organize your reactions. Categorize them by reacting functional group, reagent, and product functional group. Look for similarities in mechanism.
- Make up flash cards with reagents on one side and products on the other and with organic and inorganic reagent on one side and organic reagent and product on the other. Drill yourself.
- Keep up with lecture and reading materials.
- Make sure to do the on-line homework assignments! Although not quite the format of the exams, they

will help with your overall comprehension and exam performance.

- Use the web sites on the [Links](#) page.
- Study in groups, but make sure everyone contributes.
- The main function of office hours is to discuss and solve problems that you may be having with the course materials, assigned problems, and concepts presented during lecture. Try to formulate questions in advance. Do not expect a mini review session.
- It is official University policy that unless you have three exams on the same day, you must take the final exam in this course at the officially scheduled time. Permission to take a final at any other time for any other reason can only be obtained from the Course Instructor.
- All individuals are responsible for understanding the contents of this document.

University Policies and Procedures:

Academic Freedom and Professional Responsibilities

Academic freedom is the right to teach, study, discuss, investigate, discover, create, and publish freely. Academic freedom protects the rights of faculty members in teaching and of students in learning. Freedom in research is fundamental to the advancement of truth. Faculty members are entitled to full freedom in teaching, research, and creative activities, subject to the limitations imposed by professional responsibility. Faculty Code Policy #403 further defines academic freedom and professional responsibilities.

Academic Integrity – "The Honor System"

Each student has the right and duty to pursue his or her academic experience free of dishonesty. The Honor System is designed to establish the higher level of conduct expected and required of all Utah State University students.

The Honor Pledge: To enhance the learning environment at Utah State University and to develop student academic integrity, each student agrees to the following Honor Pledge:

"I pledge, on my honor, to conduct myself with the foremost level of academic integrity."

A student who lives by the Honor Pledge is a student who does more than not cheat, falsify, or plagiarize. A student who lives by the Honor Pledge:

- Espouses academic integrity as an underlying and essential principle of the Utah State University community;
- Understands that each act of academic dishonesty devalues every degree that is awarded by this institution; and
- Is a welcomed and valued member of Utah State University.

Academic Dishonesty:

The instructor of this course will take appropriate actions in response to Academic Dishonesty, as defined the University's Student Code. Acts of academic dishonesty include but are not limited to:

Cheating:

Using, attempting to use, or providing others with any unauthorized assistance in taking quizzes, tests, examinations, or in any other academic exercise or activity will be considered as cheating. Unauthorized assistance includes:

- Working in a group when the instructor has designated that the quiz, test, examination, or any other academic exercise or activity be done "individually;"
- Depending on the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments;
- Substituting for another student, or permitting another student to substitute for oneself, in taking an examination or preparing academic work;
- Acquiring tests or other academic material belonging to a faculty member, staff member, or another student without express permission;
- Continuing to write after time has been called on a quiz, test, examination, or any other academic exercise or activity;
- Submitting substantially the same work for credit in more than one class, except with prior approval of the instructor; or engaging in any form of research fraud.

Falsification:

Altering or fabricating any information or citation in an academic exercise or activity is considered as falsification.

Plagiarism:

Representing, by paraphrase or direct quotation, the published or unpublished work of another person as one's own in any academic exercise or activity without full and clear acknowledgment is plagiarism. It also includes using materials prepared by another person or by an agency engaged in the sale of term papers or other academic materials.

Sexual Harassment:

Sexual harassment is defined by the Affirmative Action/Equal Employment Opportunity Commission as any "unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature." If you feel you are a victim of sexual harassment, you may talk to or file a complaint with the Affirmative Action/Equal Employment Opportunity Office located in Old Main, Room 161, or call the AA/EEO Office at (435) 797-1266.

Withdrawal Policy and "I" Grade Policy:

Students are required to complete all courses for which they are registered by the end of the semester. In some cases, a student may be unable to complete all of the coursework because of extenuating circumstances, but not due to poor performance or to retain financial aid. The term 'extenuating' circumstances includes: (1) incapacitating illness which prevents a student from attending classes for a minimum period of two weeks, (2) a death in the immediate family, (3) financial responsibilities requiring a student to alter a work schedule to secure employment, (4) change in work schedule as required by an employer, or (5) other emergencies deemed appropriate by the instructor.

Students with Disabilities:

Students with ADA-documented physical, sensory, emotional or medical impairments may be eligible for reasonable accommodations. Veterans may also be eligible for services. All accommodations are coordinated through the Disability Resource Center (DRC). Please contact the DRC prior to or as early in the semester as possible. Alternate formats for course content are available with advanced notice.

Contacting the Disability Resource Center (DRC):

- On Campus: Room 101 of the University Inn
- Phone: 435-797-2444
- [DRC Website](http://www.usu.edu/drc/) [\(http://www.usu.edu/drc/\)](http://www.usu.edu/drc/)

Disability related resources for current students:

- [DRC Student Handbook](http://www.usu.edu/drc/currentstudents/handbook/) [\(http://www.usu.edu/drc/currentstudents/handbook/\)](http://www.usu.edu/drc/currentstudents/handbook/)
- [Deaf and Hard of Hearing Student Handbook](http://www.usu.edu/drc/currentstudents/DHHHandbook/) [\(http://www.usu.edu/drc/currentstudents/DHHHandbook/\)](http://www.usu.edu/drc/currentstudents/DHHHandbook/)
- [Disability Related Scholarships](http://www.usu.edu/drc/currentstudents/scholarships/) [\(http://www.usu.edu/drc/currentstudents/scholarships/\)](http://www.usu.edu/drc/currentstudents/scholarships/)
- [Campus Resources](http://www.usu.edu/drc/currentstudents/campusresources/) [\(http://www.usu.edu/drc/currentstudents/campusresources/\)](http://www.usu.edu/drc/currentstudents/campusresources/)
- [Documentation Guidelines](http://www.usu.edu/drc/prospectivestudents/docguide/) [\(http://www.usu.edu/drc/prospectivestudents/docguide/\)](http://www.usu.edu/drc/prospectivestudents/docguide/)
- [Online Resources for Students with Disabilities](http://www.usu.edu/drc/currentstudents/onlineresources/) [\(http://www.usu.edu/drc/currentstudents/onlineresources/\)](http://www.usu.edu/drc/currentstudents/onlineresources/)

Diversity Statement:

Regardless of intent, careless or ill-informed remarks can be offensive and hurtful to others and detract from the learning climate. If you feel uncomfortable in a classroom due to offensive language or actions by an instructor or student(s) regarding ethnicity, gender, or sexual orientation, contact:

- [Student Services](http://www.usu.edu/student-services/) [\(http://www.usu.edu/student-services/\)](http://www.usu.edu/student-services/): (435) 797-1712, studentservices@usu.edu [\(mailto:studentservices@usu.edu\)](mailto:studentservices@usu.edu), TSC 220
- [Student Advocates](http://www.usu.edu/ususa/legal/) [\(http://www.usu.edu/ususa/legal/\)](http://www.usu.edu/ususa/legal/): (435) 797-2912, TSC 340
- [Access and Diversity](http://www.usu.edu/accesscenter/) [\(http://www.usu.edu/accesscenter/\)](http://www.usu.edu/accesscenter/): (435) 797-1728, access@usu.edu [\(mailto:access@usu.edu\)](mailto:access@usu.edu), TSC 315









- [Multicultural Programs](http://www.usu.edu/accesscenter/multiculture/) (http://www.usu.edu/accesscenter/multiculture/): (435) 797-1728, TSC 315
- [LGBTQA Programs](http://www.usu.edu/accesscenter/lgbtqa/) (http://www.usu.edu/accesscenter/lgbtqa/): (435) 797-GAYS, TSC 314
- [Provost's Office Diversity Resources](http://www.usu.edu/provost/faculty/diversity/) (http://www.usu.edu/provost/faculty/diversity/): (435) 797-8176

You can learn about your student rights by visiting:

[The Code of Policies and Procedures for Students at Utah State University](http://www.usu.edu/studentservices/studentcode/)

(<http://www.usu.edu/studentservices/studentcode/>)

Course Summary:

Date	Details	
Mon Sep 2, 2019	 Introduction to Connect https://usu.instructure.com/courses/544546/assignments/2731022	due by 10:30am
	 Pre-Test (extra credit) https://usu.instructure.com/courses/544546/assignments/2731023	due by 10:30am
Mon Sep 9, 2019	 Week 2 Application Problems https://usu.instructure.com/courses/544546/assignments/2745021	due by 10:30am
	 Week 2 Practice Problems https://usu.instructure.com/courses/544546/assignments/2745020	due by 10:30am
Mon Sep 23, 2019	 Chapter 1. Structure and Bonding https://usu.instructure.com/courses/544546/assignments/2729282	due by 10:30am
	 Chapter 2. Acids and Bases https://usu.instructure.com/courses/544546/assignments/2729284	due by 10:30am
	 Chapter 3. Introduction to Organic Molecules and Functional Groups https://usu.instructure.com/courses/544546/assignments/2729285	due by 10:30am
	 Chapter 4. Alkanes https://usu.instructure.com/courses/544546/assignments/2729207	due by 10:30am