

Chemistry 2310 – Organic Chemistry I Fall 2009

Instructor: Dr. Bradley S. Davidson
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Meeting Time/Place: MWF 10:30 – 11:20 AM, Eccles Business 215; R 3:30 – 4:20 PM, Old Main 225

Office Hours: MWF, 9:00 – 10:00 AM; T, 1:30 – 2:30 PM; or by appointment

Support Staff: Tanner Hunsaker (SI)
Ryan Berry (UTF)
Ben Brown (UTF)

Course Web Pages: Blackboard

Materials: Text – "Organic Chemistry," Paula Yurkanis Bruice, Prentice Hall. USU Custom Ed or 5th Ed (2007).
Study Guide and Solutions Manual by Bruice.
iClicker
Model Kit – Available in Chem Stores (1st floor of Widtsoe). (recommended)

Tentative Course Outline and Exam Schedule:

| Week | Dates | Quiz | Chapter(s) |
|----------|-----------------|------|--|
| one | 8/24 – 8/28 | Pre | Introduction, Chapter 1 |
| two | 8/31 – 9/4 | 1 | Chapter 1 |
| three | 9/9 – 9/11 | 2 | Chapter 2 |
| four | 9/14 – 9/18 | 3 | Chapter 3 |
| five | 9/21 – 9/25 | | Chapter 3, Exam 1 (9/23), Chapter 4 |
| six | 9/28 – 10/2 | 4 | Chapter 4, Chapter 5 |
| seven | 10/5 – 10/9 | 5 | Chapter 5, Chapter 6 |
| eight | 10/12 – 10/15** | 6 | Chapter 6 |
| nine | 10/19 – 10/23 | | Exam 2 (10/19), Chapter 7 |
| ten | 10/26 – 10/30 | 7 | Chapter 7, Chapter 8 |
| eleven | 11/2 – 11/6 | 8 | Chapter 8, Chapter 9 |
| twelve | 11/9 – 11/13 | 9 | Chapter 9 |
| thirteen | 11/16 – 11/20 | | Exam 3 (11/16), Chapter 10 |
| fourteen | 11/23 | 10 | Chapter 10 |
| fifteen | 11/30 – 12/4 | 11 | Chapter 11, Review (12/4) |
| sixteen | 12/9 (Wed) | | Final Exam (9:30 – 11:20 am) |

****Meet on Thursday 10/15 at 10:30 AM in Bus 215; no class on 10/16.**

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 Blackboard 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. Although no formal points will be awarded, you must take the pre-test before you will be permitted to take quiz 1.
- Student evaluations will be used to evaluate course/instructor strengths and weaknesses. In addition to the standard end-of-course evaluation, a midterm questionnaire will be circulated to assess teaching/learning strategies. Constructive suggestions are welcome anytime.

General Learning Objectives for 2310

- Be able to describe atomic and molecular structure and bonding, and properly represent organic molecules.
- Be able to classify organic compounds by structure, use the IUPAC nomenclature, and identify conformational effects in organic compounds.
- Be able to predict the products of reactions of alkenes and to write the mechanisms showing how the products are formed.
- Be able to draw and interpret reaction coordinate diagrams, and be able to relate the energetic changes associated with chemical reactions to equilibrium constants and rate; be able to differentiate kinetic versus thermodynamic control of reactions.
- Be able to identify the types of isomerism in organic compounds, to identify and classify chiral centers, and explain the physical and chemical consequences of chirality.
- Be able to correctly represent the structures and bonding of alkynes, and be able to write the mechanisms for reactions of alkynes and predict the products of such reactions.
- Be able to identify compounds in which resonance is important, to predict the effect of resonance on the stability of compounds and reactive intermediates, and be able to draw resonance structures.
- Be able to identify conjugated pi systems and to explain the effect of conjugation on molecular structure and reactivity; be able to predict the products of reactions of dienes.
- Be able to write the mechanism for radical reactions of alkanes, and to predict the products of such reactions.
- Be able to write mechanisms for substitution and elimination reactions, and to predict the effect of nucleophile, leaving group, and solvent on the relative rates of S_N1 versus S_N2 reactions, and $E1$ versus $E2$ reactions, as well as on the relative rates of substitution versus elimination.

***Detailed learning objectives for each chapter are available on the Blackboard website.

Online links to chemistry materials:

- Bruice textbook website (4th edition). Do the tutorials for each chapter.
wps.prenhall.com/esm_bruice_organic_4/
- Reaction quizzes for Bruice textbook (4th edition):
www.stolaf.edu/depts/chemistry/courses/toolkits/247/practice/medialib/data/quiz.htm

- Jones and Bartlett Publishers' organic chemistry site, which has files of molecular structures, animations of chemical mechanisms, and much more: www.jbpub.com/organic-online/webhome.htm
- ChemTube3D has interactive animations and reaction mechanisms: www.chemtube3d.com/index.html
- Virtual textbook of organic chemistry: www.cem.msu.edu/~reusch/VirtualText/intro1.htm
- Web-sters' Organic Chemistry is a site that has numerous organic chemistry study aids and links to other helpful sites: Chemconnections.llnl.gov/Websters
- Curly Arrows site has excellent mechanism tutorials: www.abdn.ac.uk/curly-arrows/index.shtml
- Los Alamos Periodic Table Site: pearl1.lanl.gov/periodic

Grading Scheme:

| | | |
|---------------------|---|----------------|
| Point Distribution: | Three one-hour exams (3 × 200 pt) | 600 pt |
| | Best ten out of eleven Blackboard quizzes (10 × 10 pts) | 100 pt |
| | In-class iClicker questions | 100 pt |
| | Comprehensive Final (300 pts) | 300 pt |
| | Total Points: | 1100 pt |

Grade Breakdown:

The grade received in the course is based on your performance on the exams, quizzes, 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 |

Procedures:

1. 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*.
2. The format of the exams is a combination of fill-in (50%), where you will be expected to draw chemical structures and explain your answers, and multiple choice (50%). A self-correcting approach to the multiple-choice questions will be used. Correct answers are worth 5 pt. You will have the opportunity, after consulting your notes, textbook, even classmates, to turn in a 2nd SCANTRON, at the beginning of the next class period, with your revised answers. Answers corrected from incorrect to correct will be worth 2 pt, while answers that remain incorrect and answers changed from correct to incorrect will be worth 0 pt.
3. There will be no 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 that will be the exam dropped from your overall score.
4. 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.
5. Quizzes will be offered through Blackboard (online.uen.org/webct/entryPage.dowebct) and must be taken on your own time. Each quiz will be available from Monday, 10:30 am (MST), until the following Monday, 10:30 am. They will consist of ten multiple-choice questions, chosen randomly from a bank of questions. They will be open-book, with a time limit of 30 minutes, and

can be taken as many times as you want, with only your highest score being recorded. You will benefit the most from the quizzes if you prepare and try to take them without help from the book or your notes.

6. A single question iClicker quiz will be given at the beginning of each class period. These questions, which must be answered individually, without consulting notes, books, or neighbors, will be worth 2 pt for a correct answer and 1 pt for an incorrect answer. It is your responsibility to remember to bring your iClicker, in working order, to class each day.
7. For each exam, a "Molecule of Interest" will be selected. An extra credit question pertaining to the "Molecule of Interest" worth 5 pt will be offered on each exam.
8. All answer keys, practice tests, lists of assigned problems, etc. will be posted on the course Blackboard site. Answer keys and practice tests will be available in pdf format, which will require you to have Adobe Acrobat Reader on your computer.
9. 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.
10. The administration of Chemistry 2310 will adhere strictly to the academic regulations stipulated in the most recent USU General Catalog. The complete code of Policies and Procedures for Students can be viewed at: <http://www.usu.edu/student-services/studentcode/>.
11. 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 Dean of Science.
12. The University add/drop schedule can be found at: www.usu.edu/registrar/dates/fall.cfm. August 28th is the last day to add a class without an instructor's signature; students may add courses from August 29 – September 14th only with the instructor's signature. The last day to add is September 14th. A student may drop a class without any notation on the transcript until September 14th (the first 20 percent of the class). After that date, any drop receives a permanent "W" notation on the transcript. After 60 percent of a class is completed (October 24th), the advisor (not the Dean's Office) must approve of a drop. In addition, the "W" is accompanied by the grade in the class at the time of the drop. Finally, after 75% of a class is completed (November 11th), a student may not drop a class for any reason. The University policy on giving a grade of Incomplete will be strictly followed.
13. 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) in Room 101 of the University Inn, (435) 797-2444 voice, (435) 797-0740 TTY, or toll free at (800) 259-2966. Please contact the DRC as early in the semester as possible. Alternate format materials (Braille, large print or digital) are available with advance notice.
14. All individuals are responsible for understanding the contents of this document.

Suggestions:

1. Try not to simply memorize. You will be more successful if you strive to understand the underlying principles.
2. Organize your reactions. Categorize them by reacting functional group, reagent, and product functional group. Look for similarities in mechanism.
3. 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.

4. Keep up with lecture and reading materials.
5. Make sure to take the quizzes and do the on-line homework problems! In addition to helping your overall comprehension and exam performance, do not miss easy-to-obtain points.
6. Work the problems! Work the problems! Work the problems! (practice makes perfect)
7. Use the web sites listed above.
8. Study in groups, but make sure everyone contributes.
9. Use molecular models and/or the textbook website to visualize the three-dimensional nature of organic molecules.