**Instructor:** Dr. Bradley S. Davidson  
Office: Widtsoe 341  
Phone: 797-1628  
E-mail: brad.davidson@usu.edu

**Meeting Time/Place:** MWF 10:30 – 11:20 AM, Eccles Business 215; R 3:30 – 4:20 PM, ESLC 130

**Office Hours:** TBD

**Support Staff:**  
Russell Butler (SI)  
Jesse Spinner (UTF)  
Nathan Kunzler (UTF)

**Course Web Pages:** Blackboard (online.usu.edu)

**Materials:**  
iClicker  
Model Kit – Available in Chem Stores (1st floor of Widtsoe). (recommended)

**Course Description:** The second of a two-semester sequence, covering structures, physical properties, nomenclature, mechanisms of reactions, and biological relevance of organic and bioorganic molecules.

**Tentative Course Outline and Exam Schedule:**

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Quiz</th>
<th>Chapter(s)</th>
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<tbody>
<tr>
<td>one</td>
<td>1/9 – 1/13</td>
<td>Pre</td>
<td>Introduction, Chapter 13</td>
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<tr>
<td>two</td>
<td>1/18 – 1/20 (1/16 no class)</td>
<td>1</td>
<td>Chapter 13, Chapter 14</td>
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<tr>
<td>three</td>
<td>1/23 – 1/27</td>
<td>2</td>
<td>Chapter 14</td>
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<tr>
<td>four</td>
<td>1/30 – 2/3</td>
<td>3</td>
<td>Chapter 14, <strong>Exam 1</strong> (2/1), Chapter 12</td>
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<tr>
<td>five</td>
<td>2/6 – 2/10</td>
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<td>Chapter 15</td>
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<td>six</td>
<td>2/13 – 2/17</td>
<td>4</td>
<td>Chapter 15, Chapter 16</td>
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<td>seven</td>
<td>2/21 – 2/24 (2/21 Monday schedule)</td>
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<td>Chapter 16</td>
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<td>eight</td>
<td>2/27 – 3/2</td>
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<td>nine</td>
<td>3/5 – 3/9</td>
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<td>Chapter 17, Chapter 18</td>
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<td>ten</td>
<td>3/12 – 3/16</td>
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<td><strong>Spring Break</strong></td>
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<td>eleven</td>
<td>3/19 – 3/23</td>
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<td>Chapter 18</td>
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<td>twelve</td>
<td>3/26 – 3/30</td>
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<td>thirteen</td>
<td>4/2 – 4/6</td>
<td>9</td>
<td>Chapters 19, <strong>Exam 3</strong> (4/6)</td>
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<td>fourteen</td>
<td>4/9 – 4/13</td>
<td>10</td>
<td>Chapter 20</td>
</tr>
<tr>
<td>fifteen</td>
<td>4/16 – 4/20</td>
<td>11</td>
<td>Chapter 21, Chapter 22*</td>
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</tbody>
</table>

| seventeen| 5/2 (Wed) | | **Final Exam** (9:30 – 11:20 am) |

*Materials from these chapters will only be briefly introduced.*
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. Constructive suggestions are welcome anytime.

IDEA Objectives: A new course evaluation system will be used this year, wherein you will be able to self-access your progress in achieving 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 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.

General Learning Objectives for 2320:

Organic chemistry is a cumulative subject; therefore, you will be required to continue demonstrating your knowledge and understanding of the topics covered in Chem 2310. In addition, you will need to:

- Be able to write the mechanism for radical reactions of alkanes, and to predict the products of such reactions.

- Understand what structural properties are probed by mass spectrometry, infrared spectroscopy, and ultraviolet spectroscopy, and be able to use spectral data to identify the structures of organic molecules.

- Understand the structural properties probed using nuclear magnetic resonance (NMR) spectroscopy, such as the interactions between nuclei, magnetic fields, and radiofrequency radiation, and be able to interpret proton and carbon NMR spectra to identify the structures of organic molecules.

- Be able to identify aromatic and antiaromatic compounds and appreciate the chemical consequences of aromaticity; be able to write the mechanisms for and predict the products of electrophilic aromatic substitution reactions.

- Be able to explain and to predict the effects of substituents on the reactivity and regiochemistry of electrophilic aromatic substitution reactions.

- Know the structures and chemical properties of carboxylic acid derivatives; be able to write the mechanisms for nucleophilic substitution and hydrolysis reactions of such compounds, and to predict the products of such reactions.

- Be able to write mechanisms for nucleophilic addition reactions and for addition-elimination reactions of aldehydes and ketones, and be able to predict the products of such reactions.
• Understand the reason for and the consequences of the acidity of protons alpha to carbonyl groups, be able to write mechanisms for the reactions of enolate anions, and predict the products of such reactions.

• Be able to identify the various forms of catalysis (including nucleophilic, general acid/base, specific acid/base, anchimeric assistance, metal-ion catalysis) and be able to write mechanisms for such processes.

• Be able to identify general classes of biomolecules, such as amino acids, peptides, proteins, lipids, nucleic acids, and carbohydrates.

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

**Online links to chemistry materials:**

• Bruice eText (6th edition). An access code is provided with your book from the bookstore.

• 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

• 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

• Los Alamos Periodic Table Site:  pearl1.lanl.gov/periodic

**Grading Scheme:**

**Point Distribution:**  
Three one-hour exams (3 5 200 pt) 600 pt  
Best ten out of eleven Blackboard quizzes (10 5 10 pts) 100 pt  
In-class iClicker questions 50 pt  
Comprehensive Final (300 pts) 300 pt  
**Total Points:** 1050 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 you answers, and multiple choice (50%). A self-correcting approach to the multiple-choice questions will be used. Correct answers are worth 6 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. The average of your two SCANTRON results will apply toward your grade.

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 you will receive a zero.

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.usu.edu) and must be taken on your own time. Each quiz will be available from Monday, 10:30 AM (MST), until the following Friday, 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. You have an entire week, 24/7, to take the quizzes. **Do not ask for an extension.**

6. A single question iClicker quiz will be given at the beginning of MWF class (except for exam days). 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. Some Thursdays will involve directed group activities. Students will be encouraged to work within groups of 3-4 students. Handouts that will be available on Blackboard for downloading and printing, will need to be brought to class.

8. 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.

9. 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.

10. 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.

11. The administration of Chemistry 2320 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/studentservices/studentcode/.

12. 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.

13. The University add/drop schedule can be found at: www.usu.edu/registrar/. The University policy on giving a grade of Incomplete will be strictly followed.

14. 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.

15. 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.
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.