

CHE-141
Organic Chemistry I
Spring 2012
Gustavus Adolphus College

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Textbooks Lecture: Organic Chemistry: A Biological Approach (2nd edition),
McMurry. 2011

James W. Zubrick, *The Organic Chem Lab Survival Manual: A Student's Guide to Techniques*, 2010.

On-Line SAPLING (<http://www.saplinglearning.com/>)
Moodle (<http://moodle.gac.edu/>)

Supplies: A model kit: *Molecular Visions* by Darling Models.

Classroom: Olin Hall **103**
Mon, Tue, Wed, Fri **9:00-9:50 am**

Office Hours: My scheduled office hours are Mon, Wed, & Thu: 12:00 to 1:00 and by arrangement

Homework:

Homework that is graded will be on-line problems through SAPLING. Count on spending a significant amount of time on the homework.

Exams:

There will be four 1-hour exams that will consist of short answer questions. In addition to asking you to be able to recall facts and principles from lectures and textbook readings, you will be asked to extend the principles you learned to new situations and to offer explanations of the behavior of compounds with which you are not familiar. Each exam will be "comprehensive" because each new concept builds upon previous material. So you will need to know material from earlier units. Test dates are as follows: February 24; March 16; April 13; and May 16. The final exam will be comprehensive, and will be in the NHS 121 on Tuesday, May 22 from 3:30 - 5:30 pm.

Peer Mentoring

To help you develop strong learning skills and to better understand the ethos of scientific inquiry you will participate in a Peer Mentoring program. This program is funded with a grant from the Howard Hughes Medical Institute (HHMI). Our goal is to help you be more successful in biology, chemistry and other coursework.

Each week, you will meet with a small group of peers also enrolled in BIO102 and/or CHE141. The sessions are led by a junior or senior biology, chemistry or biochemistry major. The sessions involve activities where you will practice application and synthesis of concepts, and gain an enhanced understanding. There are three main types of activities:

1. Lecture and Laboratory content reinforcement and practice
2. Skill building
3. How to think and act like a scientist

You are required to sign up for a peer-mentoring group in NHS 121 on T, Feb.7th or W, Feb 8th between 5:00 and 9:00 pm. If you are enrolled in either BIO 102 Organismal Biology or CHE 141 Organic Chemistry, you will sign up for a group that will focus solely on that class. If you are enrolled in both BIO 102 and CHE 141, you will sign up for a group that does activities for both courses. Please bring your class and event schedule so you can choose the best time for you and your lifestyle. Peer mentors will be available to answer your questions.

You will meet with your group once a week in Nobel 121 or Nobel 222. Bring a notebook and a pen/pencil to your session, and possibly a textbook. Do not use electronic devices with the possible exception of a computer if one is needed to complete the activity. Eleven sessions are scheduled. A list of the Peer Mentoring activities for the semester is on Moodle. **If you do not attend and actively participate in eight of the 10 peer mentoring sessions, you will lose 5% of your final course points.** If you have any questions, please contact Pamela Kittelson, HHMI Peer Mentoring Coordinator at pkittels@gustavus.edu.

Grading

The breakdown of your grade is as follows:

| | |
|-------------------------------|-----|
| Four one-period exams..... | 40% |
| Homework..... | 12% |
| Quizzes..... | 8% |
| Comprehensive final exam..... | 20% |
| Laboratory..... | 20% |

Please note that the grade is based upon your cumulative point total. Laboratory performance is not graded separately then averaged. The total of your lab reports and notebook entries will be normalized, weighted, and added to your cumulative score before grades are assigned. **You have to attend and do ALL the laboratories in order to get a passing grade. Failing laboratory portion of this class means automatic failure of the whole course.**

The final cumulative total, weighted as shown above, will be assigned a grade based upon a standard scale: 93 - 100% =A; 90 - 92% = A-; 87 - 89% = B+; 83 - 86% = B; 82 - 80% = B-; etc. *I reserve the right revise the grading scale as seems appropriate for the class.*

Student Responsibility

At Gustavus, we want students to be active in their own education. For the majority of you, this is your second semester at Gustavus, and you are still learning how the system works. One of the differences between your college experience and your previous educational experiences is the responsibility born by each party. Your teachers here are less likely to simply disseminate facts that you must regurgitate on an exam later; rather, they are guides who will provide opportunities for you to expand your understanding of the world in which we live. *Gustavus faculty provides the opportunities for you to learn, but you must take advantage of those opportunities.* It is in this spirit that homework due-dates are set such that lecture is not the first time you will have encountered material. This allows you to know where you are having trouble and ask more relevant questions in lecture. I will do my best to help you understand the material, but you are ultimately responsible for that understanding.

Academic honesty

As a community of scholars, the faculty and students of Gustavus Adolphus College have formulated an academic honesty policy and honor code system, which is printed in the Academic Bulletin and in the Gustavus Guide.
(Academic Information and Policies, General Catalog)

The Honor Code at Gustavus is an expression of the importance with which we view academic integrity. Each faculty member is required to implement the Honor Code, and to define what is (or is not) authorized aid. It is the students' responsibility to ask clarifying questions when there is confusion regarding academic honesty. In this class, it is assumed that students are honest about their work. It is also understood that sometimes the boundaries can seem "fuzzy." If you find yourself in a situation where you are unclear about attributions or the use of sources, please ask. In the professional realm, issues of plagiarism and/or fabrication have ruined careers.

The first instance of cheating on an assignment or exam will result in a score of zero for that assignment or exam, and the Dean of Faculty will be informed of the incident. The second instance will result in a grade of F for the course.

To impress of the importance of these two items (student responsibility and academic honesty), I require that you sign the following pledge and return the signed page to me by the beginning of class on Friday, February 17.

On my honor, I pledge that I will not give, receive, or tolerate others' use of unauthorized aid in completing my work.

signature

date

printed name

student ID

Study Hints

Success in organic chemistry requires practice. Much of the information builds upon concepts previously presented; **frequent review is essential**. Here are a few tips to help keep the course material under control:

I. Outline the chapters

Reading a science textbook can cure even the most chronic insomnia. Learning how to read and retain the information is critical for your success. Many students use highlighters to bring attention to important passages. You will quickly find that *everything* in science textbooks is considered important. Highlighting does not work. A better approach is to learn how to outline a chapter.

Read a paragraph and paraphrase (in your own words) what the paragraph means. This causes you to actively assess the information, and is similar to the process of "deep reading" in literature classes. This is a learned skill, and you will probably write too much for each concept in the beginning. At the end of each chapter, there is a chapter summary. Your outline should not be more than twice the length of the summary (in outline form). More than that, and you are simply copying material, not processing it.

Outline before class, and write your questions in the margins. When we get to that part in the lecture, you can ask a productive question.

II. Do the homework problems

The SAPLING problems are designed to test your understanding of concepts. If you get a question wrong, you will have the opportunity to read a tutorial and see if you have learned the concept. When you try it again, you will get a new problem based upon the same concept. You cannot "brute-force" an answer.

You should also try the problems at the end of the chapters. Many people will try a question and look at the answer right away. If the answer is wrong, the temptation is to say "Oh, yeah. I see what I did...." and move on. If you do this, you have learned nothing. A better strategy is to work a number of the problems, then check them all. If you got something wrong, go back and try another similar problem.

III. Ask Questions

If you have a question in class, the odds are that someone else has the same question. Feel free to ask questions in class. The office hours listed (first page) are those in which I guarantee I will be available. However, I will also be in my office at other times and will be willing to see you if I am free. If the listed times are not convenient, see me and we will arrange a time to meet. **If you are spending more than 2 hours per night on this course, you are doing something wrong. Come see me and I will help you as best I can.**

Disabilities

Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (1990) work together to ensure 'reasonable accommodation' and non-discrimination for students with disabilities in higher education. A student who has a physical, psychiatric/emotional, medical, learning, or attentional disability that may have an effect on the student's ability to complete assigned course work should contact the Disability Services Coordinator in the Advising Center, who will review the concerns and decide with the student what accommodations are necessary.

Course Coverage

In first semester organic chemistry (the chemistry of carbon-containing compounds), we will learn the language and many of the principles governing organic chemistry. We will study molecular structures, nomenclature, reactions, and reaction mechanisms of alkanes, alkenes. We will also learn about how we know what molecules "look" like.

The schedule below gives a tentative outline of the topics we will study.

Che-141 Tentative Class Schedule Spring 2012

| Week | Topic | Lectures | Reading | Exam |
|----------|--|----------------------------|--|---|
| 1 | Structure and Bonding (Check in and Urea Lab) | Feb. 6, 7, 8, 10 | Chapter 1 | Feb 10: Quiz 1 |
| 2 | Polar Covalent Bonds; Acids and Bases (White Solids Lab) | Feb. 13, 14, 15, 17 | Chapter 2 | Feb 17: Quiz 2 |
| 3 | Alkanes & Their Stereochemistry (White Solids Lab cont.) | Feb. 20, 21, 23 | Chapter 3 | Feb 24: Exam 1 |
| 4 | Cycloalkanes & Their Stereochemistry (Acid/Base Extraction Lab) | Feb. 27, 28, 29, Mar. 2 | Chapter 4 | Mar 2: Quiz 3 |
| 5 | Stereochem at Tetrahedral Centers (Acid/Base Extraction cont.) | Mar. 5, 6, 7, 9 | Chapter 5 (sec. 1 – 10) | Mar 9: Quiz 4 |
| 6 | Stereochem at Tetrahedral Centers; Organic Reactions Overview (Chiral Resolution Lab) | Mar. 12, 13, 14 | Chapter 5 (sec. 11 – 12) Chapter 6 (sec. 1 – 6) | Mar. 16: Exam 2 |
| 7 | Organic Reactions Overview; Alkenes (Stereochem. of Brom. Lab) | Mar. 19, 20, 21, 23 | Chapter 6 (sec. 7 – 11) Chapter 7 (sec. 1 – 6) | Mar 23: Quiz 5 |
| 8 | Alkenes; Reactions of Alkenes (Terpenes Isolation Lab) | Mar. 26, 27, 28, 30 | Chapter 7 (sec. 7 – 10) Chapter 8 (sec. 1-8) | Mar 30: Quiz 6 |
| 9 | Spring / Easter Break (March 31 – April 9) | | | |
| 10 | Reactions of Alkenes (no lab this week) | Apr. 10, 11 | Chapter 8 (sec. 9-14) | Apr. 13: Exam 3 |
| 11 | IR, UV Spectroscopy; Mass Spectrometry (M NMR Spectroscopy (Terpenes Spectroscopy Lab) | Apr. 16, 17, 18, 20 | Chapter 10; Chapter 11 (sec. 1-6) | Apr 20: Quiz 7 |
| 12 | NMR Spectroscopy (Unknowns Qual. Lab) | Apr. 23, 24, 25, 27 | Finish Chapter 11 | Apr 27: Quiz 8 |
| 13 | Aromatics (Unknowns Spectroscopy Lab) (Lab Checkout) | April 30, May 1, 2 | Chapter 9 (sec. 1 – 5) | May 4: Exam 4 |
| 14 | Alkyl halides; Substitution & Elimination (Unknowns Presentations) | May 7, 8, 9, 11 | Chapter 12 | May 11: Quiz 9 |
| 15 | Alkyl halides; Substitution & Elimination | May 14, 15, 16 | Finish Chapter 12 | May 22: Final Exam NHS 121 3:30-5:30 |