Department of Chemistry
University of Vermont

Chemistry 142 Spring, 2013
Organic Chemistry
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Office hours:

Mon	3:30-4:30
Th	10:15-11:15
Fri	1:30-2:30

or by appointment

Text: David Klein "Organic Chemistry" John Wiley and Sons Inc. ISBN 978-0471-75614-9 and "Student Guide and Solutions Manual for Organic Chemistry" John Wiley and Sons Inc. ISBN 978-0-471-75739-9.

Molecular Models: HGS Molecular Structure Models.

Chem. 142 Laboratory Manual: (available from 1st floor stockroom, Cook A143).

Bound lab notebook: with numbered pages (can continue to use that purchased for 141).

Safety glasses: (available in the UVM Bookstore).

Course Prerequisite: Chemistry 32 or 36 and 141 or 143.

Outline

Tentative Outline of Course

Chapter 15. Infrared Spectroscopy and Mass Spectrometry All Sections except 15.13–15.15

Chapter 16. Using Nuclear Magnetic Resonance Spectroscopy to Deduce Structure All Sections except 16.13

Chapter 13. Alcohols Sections 13.2–13.4; 13.6; 13.9–13.10

Chapter 14. Ethers and Epoxides (very brief!) Sections 14.1; 14.3; 14.5; 14.8; 14.10; 14.12

Chapter 17. Conjugated Pi Systems and the Diels–Alder Reaction Sections 17.1; 17.2; 17.4; 17.7

Chapter 18. Aromatic Compounds Sections: 18.1–18.3; selected portions of 18.4 and 18.5, 18.6

Chapter 19. Aromatic Substitution Reactions All Sections except 19.13–19.15

Chapter 20. Aldehydes and Ketones All Sections except 20.2; 20.8; and 20.13

Chapter 21. Carboxylic Acids and Their Derivatives All Sections except 20.15

Chapter 22. Alpha Carbon Chemistry: Enols and Enolates Sections 22.1–22.4, selected portions of 22.5 and 22.6

Time Permitting:
Chapter 23. Amines Sections 23.1; 23.3–23.7

Thursday Evening Recitations:
Each week I will email some suggested problems to be discussed at the following Thursday Evening Recitation. This is a perfect opportunity to practice problems and work through some of the tricky points in regards to the new concepts. The questions are not graded but many students find these recitation sessions to be very helpful.

Key's to success in Organic Chemistry:

- Do not try to cram!
- Work as many practice problems as possible. Practice problem reinforce the new concepts and are the only way to test your understanding of the material.
- You will see many new concepts in this course. Try to write out an explanation of the concepts in your own words as if explaining them to someone else.
- Do not look at a problem's answer until you have really tried the problem. After seeing the answer it often seems obvious and you may assume you understand.
- When you get a problem wrong, try to understand where your thinking was in error and attempt to identify what concept you missed.
- Ask questions!
- Come to review sessions, office hours or make an appointment with me or your T.A. to resolve any questions early!
- Review the material frequently.

For each chapter you should work as many of the suggested problems as possible. I strongly urge you to keep up with your reading and problem solving. Learning organic chemistry takes a combination of patience, practice, and repetition. Cramming does not work well in this subject!

Academic Conduct: Cheating will be considered grounds for failing the course. All graded assignments must be your own work. Cases of cheating or plagiarism *will* lead to further disciplinary action which may include dismissal from the University according to the rules set forth in The University of Vermont's *Code of Academic Integrity*.

Policy of Electronic Device Usage on Exams: In short, you can't use them! The use of any electronic device (calculator, cell phone, ipod, or anything else with batteries or a solar cell) is strictly forbidden on exams and will be considered cheating.

Exams

Your course grade will be based on three examinations, a cumulative final examination, and your laboratory grade.

Lab	20%
Exam 1	20%
Exam 2	20%
Exam 3	20%
Cumulative Final	20%

Midterm Dates:

February 21	5:30 P.M.-8:00 P.M. Angell B106
March 21	5:30 P.M.-8:00 P.M. Angell B106
April 18	5:30 P.M.-8:00 P.M. Angell B106

Final Exam Date:

May 6	7:30-10:15

Final Exam Location:

` Angell B106

No exam grades are dropped. However, if you do better on either the ACS standardized exam or the final exam than your lowest exam grade, I will drop your lowest exam grade and count the highest of these exams twice. The only valid excuses for missing an exam are medical or other true emergency situations. If you miss an exam for such a reason, you must inform me of it promptly, present appropriate documentation of your excuse, and receive formal approval to take a make up exam. If you miss an exam for any other reason, you will receive a grade of zero for that exam. There will be only one make-up exam given during the semester; it will be scheduled at the end of the semester, and it will be cumulative.

Multiple Choice, Alternate Standardized Final: Lab Week of April 22 – 25 One goal of our department is to access student learning in our courses by gathering data that indicates how much a student has learned in a given subject. To do this in a scientific way, a cumulative, standardized 70 multiple-choice question exam will be administered during the final week of lab. The exam covers concepts from both CHEM 141 and 142.

This exam is optional and is given as an alternative to my normal final exam. If you choose to take this exam, you have the choice of using the grade you receive on this exam as your final exam grade (i.e.; you do not need to take the normal final exam). However, if you take this exam and you are not satisfied with the grade you receive on this exam (raw, un-normalized score), you are still welcome to take the normal final exam. If you take both exams, only the higher exam score will be used as your final exam score. You will be informed of your score on this exam well in advance of the normal final.

Exam Re-grades: If you have any questions concerning the grading of an exam, you must see me within one week after the day the exam is returned to the class. Exams must be taken in ink to insure that you can get points for a grading error.

This course will address learning goals 1,2,3, and 5 below for chemistry majors:

1. Students will demonstrate general knowledge in chemistry and will be able to apply chemical and physical principles in the solution of qualitative and quantitative chemical problems.
2. Students will understand the interplay of observational data, hypotheses, and hypothesis-driven experimentation through application of the scientific method.
3. Students will become proficient in chemical laboratory techniques and be able to apply these to practical and current problems in research.
4. Students will be able to read and critically evaluate the chemical and scientific literature.
5. The students will learn to present scientific data clearly and effectively through both written and verbal communication.

Religious Holidays: Students have the right to practice the religion of their choice. Each semester students should submit in writing to their instructors by the end of the second full week of classes their documented religious holiday schedule for the semester. Faculty must permit students who miss work for the purpose of religious observance to make up this work.

On-line resources that may be useful to you

http://bcs.whfreeman.com/organic6e
Publisher's website has: Online quizzes, Animated Reaction Mechanisms, Animated Orbital Images, Nomenclature Exercises,Videos of lectures given by author of our textbook

http://www.aceorganicchem.com/resources.html
"Organic Chemistry Best of the Web 2010" – compilation of websites

http://www.chemtube3d.com/Main%20Page.html
High quality videos of organic reaction mechanisms.

http://ochem.jsd.claremont.edu/intro.htm
On-line flash cards Video Tutorials Practice Problems

Chemistry 142 Laboratory

Spring, 2013

Chem. 142 Laboratory Manual: (available from 1st floor stockroom, Cook A143).

General Considerations:

Read the Manual before doing the experimental work.

Date	Expt #	Title	Page
1/28-1/31	1	Synthesis of Alkyne: Addition-Elimination	9
2/4-2/7	2	Diels-Alder Cycloaddition	12
2/11-2/14	3	Nitration of Methyl Benzoate	15
2/18-2/28		NO LAB/PRESIDENT'S DAY HOLIDAY	
2/25-2/28	4	Generation and reaction of an organometallic compound Part 1	18
3/4-3/7		NO LAB/ SPRING RECESS	
3/11-3/14	5	Generation and reaction of an organometallic compound Part 2	18
3/18-3/21	6	The Wittig Reaction	21
3/25-3/28	7	Solventless Aldol	24
4/1-4/4	8	Production of Biodiesel	26
4/8-4/11	9	Synthesis of Aspirin	28
4/15-4/18		CHECKOUT	
4/22-4/25		ACS STANDARDIZED EXAM	

Laboratory Safety:

The organic laboratory is a very safe place to work if safety precautions are always observed. Caution, as well as careful thought and knowledge of the characteristics of what one is working with are necessary to avoid accidents and injuries. Potentially hazardous apparatus and flammable, toxic, and/or corrosive chemicals are sometimes used. The following rules and procedures will be observed at all times.

Rules:

1. You must wear safety goggles or OSHA approved glasses in the laboratory. Do not wear contact lenses.

2. Avoid personal contact with chemicals. Many chemicals Have an adverse physiological effect (e.g. narcosis, toxicity, alergenicity, etc.). It is best to wear protective gloves. If you spill any chemical on your skin, wash it off at once with soap and water and tell your TA. Do not inhale chemicals or put them in your mouth.

3. Performance of unauthorized experiments is not allowed.

4. Horseplay in the laboratory is strictly forbidden.

5. Drinking, eating, or smoking in the laboratory is prohibited.

6. Removal of chemicals and equipment from the laboratory is forbidden.

7. Report all accidents and injuries, however minor, to the instructor.

8. Extraneous sources of sound are not allowed.

9. Do not work in the laboratory while under the influence of drugs or alcohol.

10. Dress properly. Do not wear open shoes or sandals. Do not wear baggy clothes. Long hair must be tied back.

11. Do not pipette by mouth.

12. When leaving the laboratory make sure all gas, air, water, steam, and electricity are turned off.

13. Know the location of exits, safety showers and eye-wash fountains.

14. Protect your hands with gloves or a towel when pushing glass tubing or thermometers into stoppers or rubber tubing. Lubricate the hole.

15. The working space, drawers, cabinet, and shelf above your bench should be neat and clean at all times.

16. The balances and balance area should be cleaned of any chemical spill.

17. Put glass in the broken glass disposal box; not in the trash.

18. Always point test tubes, flasks, and separatory funnels away from you or other passers by.

19. Follow the instructions in you laboratory text for proper waste disposal.

In case of accident

1. Fire. Personal safety is most important. Make sure everyone gets out of the room and the building. After the safety of all is assured, you may extinguish the fire. If a person's clothing catches fire, he or she needs help. Prevent the person from running. Put him or her under the safety shower and pull the chain. (It is less effective to smother flames with a fire blanket. Never spray a person with a carbon dioxide fire extinguisher.

2. Chemicals. If corrosive chemicals are spilled on clothing, immediate showering with the clothes on is the best remedy. If chemicals are spilled on the skin, wash them off with large volumes of water. If the chemical is pilled in the eyes, it should be washed immediately at the aye wash fountain.

3. Injuries. All injuries, no matter how minor must be treated immediately by competent medical staff at the University infirmary. Report the injury to your lab instructor.