

**Virginia Polytechnic Institute and State University
Department of Chemistry**

Organic Chemistry

Chem 2535
CRN# 91091

Fall Semester 2001

Instructor: Dr. D. G. I. Kingston

Telephone: 231-6570

Hahn Hall 3111
E-mail: dkingston@vt.edu

Required Text: "Organic Chemistry, Third Edition," by K. Peter C. Vollhardt and Neil E. Schore (W. H. Freeman & Co., 1999) ISBN 0-7167-2721-8

Recommended Study Aids: "Study Guide and Solutions Manual for Organic Chemistry, Third Edition," by Neil E. Schore (W. H. Freeman & Co., 1999) ISBN 0-7167-3165-7
Molecular Model Set, such as Molecular Structure Model C Set for Organic Chemistry or Molecular Visions Model Set (packaged with the test or available separately for those who buy used texts)

Lecture and Exam Schedule

<i>Date</i>	<i>Chapter</i>
August 27, 29	1:1-1:6
September 3, 5	1:7-2:6
September 10, 12	2:7-2:6, 3:1-3:5
September 17, 19	3:6-3:10, 4:1-4:4
September 24	4:5-4:7, 5:1
Wednesday, September 26	Test 1: Chapters 1-3
October 1, 3	5:2-5:8
October 8, 10	6:1-6:10
October 15	7:1-7:5
Wednesday, October 17	Test 2: Chapters 4-6
October 22, 24	7:6-7:9, 8:1-8:6
October 29, 31	8:7-8:9, 9:1-9:5
November 5, 7	9:6-9:11, 10:1-10:3
November 12	10:4-10:7
Wednesday, November 14	Test 3: Chapters 7-9
November 19, 21	Thanksgiving Break
November 26, 28	10:8-10:9, 11:1-11:4
December 3, 5	11:6-11:9, 12:1-6
December 10, 12	12:8-11, 12:13,14, 12:16, Make-up class
December 19, 2:05 p.m.	Final Exam Chapters 1-12

Examinations and Grading

The grading scheme will be as follows:

- Midterm exams (25% each, best 2 out of 3) 50%
- Web-based quizzes 10%
- Final Exam 40%

The three midterm exams will be given during the semester on the dates indicated; *your best two exams only will be counted*. The quiz scores will be based on the quizzes you take on the web page for the course at <http://www.whfreeman.com/vollhardtschore/> After taking each quiz, you must submit your answers for grading and request that your score be submitted to my E-mail address. You must also submit the quiz by the due date indicated in the Study Guide; *late quizzes will not be graded*. The final will be comprehensive, but will have a higher weighting of

questions from chapters 10-12; it will be worth 40 percent. The material for the exams will be taken primarily (80-90%) from the problems in the text and on the CD-ROM (or web site) supplied with the text; the remaining 10-20% will be from the lecture notes. The exams will be a combination of multiple choice questions (similar to those of the quizzes you will be taking) and written questions. The plus/minus grading scheme will be used for final grades.

Missed Exams

No make-up exams will be given except for serious personal illness or serious illness or death in your immediate family. In all cases please communicate with me by E-mail *before* the exam if possible, and definitely within one week after the exam.

Honor Code

Students are encouraged to share class notes and to discuss problems together; some problems in the text are designed as team problems and are meant to be worked together. The honor code at Virginia Tech applies to all examinations: the Virginia Tech Honor Pledge is "I have neither given nor received unauthorized assistance on this assignment" and should appear on each examination. For the graded quizzes you are allowed to practise on the CD-ROM version before you take a quiz for a grade on the web, but you may not receive any aid from another person in taking the quiz. Your submission of the quiz for a grade implies that you have abided by this part of the Honor Code.

Special Needs

If you have any special needs including learning disabilities or athletic obligations, and desire to discuss these with me privately, please make an appointment to see me *within the first two weeks of classes*. Appropriate university documentation will be needed for most special situations.

Help Sessions

Help sessions will be offered weekly on Tuesdays at 5:00–6:00 p.m. beginning September 4. The Tuesdays before exams the help sessions will be from 5:00–7:00 p.m.

Office Hours

Open office hours are from 1:30-3:30 p.m. on Tuesdays. If you need help at other times please schedule an appointment. The Chemistry Learning Center is also available for help between 9 a.m. and 5 p.m.

How to Study for this Course

For many students Organic Chemistry is the most demanding course they take. This is largely because of the nature of the material, which requires *both* a clear understanding of the basic concepts *and* also the ability to remember a lot of chemical reactions. Unlike some courses (mathematics comes to mind) understanding alone is not enough – you have to know the reactions. But unlike some other courses, memorizing facts alone is not enough – you have to know how they all relate together. Learning Organic Chemistry is a lot like learning a new language – you have to understand the grammar (the way reactions occur) but you also have to learn the vocabulary (the chemical reactions). A final reason for the difficulty of Organic Chemistry is that it builds on itself: concepts you learn this semester will be used and reused throughout the year. It is thus important that you stay up to speed with your understanding. So how can you best study for this course? There is no one simple answer, but the following suggestions may be helpful:

The twelve Commandments of Organic Chemistry

1. Remember that this is a 3-credit course, which means that you should expect to spend at least 6 hours a week on studying for it, exclusive of class time. (Many students find that they need more time than this).
2. Read through the assigned material before the lecture.

3. Take detailed notes during the lecture. When I was a student I would make a “fair copy” of these notes as soon after class as possible. This process of copying the notes helped me to remember the material, and it will probably work for you, too.
4. Re-read the assigned material and work the in-text problems as you do so.
5. Work as many of the assigned problems as you can. Try to understand the concept behind each question; resist the temptation to look the answer up until after you have given the question your best shot.
6. Use the CD-ROM in your textbook (or the web site provided by the publisher) for additional insights on some topics: the study guide indicates where this will be helpful.
7. Use your model kit for problems involving stereochemistry.
8. Try to work some problems every day – an hour a day would be a good schedule.
9. If you have questions, ask Professor Kingston (dkingston@vt.edu). Questions related to the course material will usually be answered at the beginning of the next class so that all students can learn from them.
10. Check the course web site for any additional material.
11. Attend the weekly help sessions if your schedule permits it.
12. Above all, keep up with the material as best you can, and do not give up! It WILL make sense if you work at it!

Websites

The class website is on Blackboard at <http://www.learn.vt.edu/> You will need to enter your PID and then select this course (Index #91091). Consult this for announcements, grades, and access to additional resources. The textbook website and a helpful website on the use of curly arrows (referred to as “web:Curly Arrows” in the Study Guide) can both be accessed from the course website or directly at <http://www.whfreeman.com/vollhardtschore/> (textbook) or <http://www.abdn.ac.uk/~che545/index.html> (curly arrows). I recommend that you bookmark these websites for future reference.

Study Guide

The study guide below lists suggested problems from the textbook and also gives guidance to helpful portions of the CD-ROM and the web-based “Curly Arrows” site. Remember that most of the exam questions will be drawn from these problems (although their working and format will differ from that of the problem). You can thus regard the study guide as a “koofer” for your exams.

Chapter

- | | |
|---|---|
| 1 | Problems: 18, 19, 20, 21, 22, 24, 26, 28, 29, 33, 37, 40, 41, 45
CD or web: VisChem Animations: orbitals, hybridization
Web: Q & A Chapter 1. Due September 6. |
| 2 | Problems: 1-16, 18, 19, 20, 21, 23, 24, 27, 29, 35, 36, 37, 39-42.
CD or web: VisChem Animations: Molecular Representations: Methane, Ethane, Butane
CD or web: Interactive Exercises: Nomenclature: Alkanes
Web: Q & A Chapter 2. Due September 13. |
| 3 | Problems: 1-8, 9, 10, 13, 16, 18, 19, 22, 37-40
CD or web: Interactive Exercises: Reactions: Alkanes
Web: Q & A Chapter 3. Due September 20. |
| 4 | Problems 1-12, 13, 14, 15, 18, 19, 21, 29, 40-43
CD or web: VisChem Animations: Molecular Representations: Cyclohexane
CD or web: Interactive Exercises: Nomenclature: Cycloalkanes
CD or web: Interactive Exercises: Reactions: Cycloalkanes
Web: Q & A Chapter 4. Due October 4. |
| 5 | Problems: 1-22, 23, 25, 26, 28, 29, 31, 35, 39, 40, 42, 44, 45, 48, 54-57
CD or web: VisChem Animations: Molecular Representations: R-2-Bromobutane, S-2-Bromobutane |

- Web: Q & A Chapter 5. Due October 11.**
 6 Problems: 1-22, 23, 24, 26, 28, 30, 32, 33, 35, 36, 38, 44, 48-51
 CD or web: VisChem Animations: Nucleophile/Electrophile Interaction: Nucleophilic Substitution
 CD or web: Interactive Exercises: Nomenclature: Haloalkanes
 CD or web: Interactive Exercises: Reactions: Haloalkanes
 Web: Curly Arrows: Nucleophilic Substitution Reactions
 Web: Q & A Chapter 6. These quizzes will not be graded.
- 7 Problems: 1-15, 16, 17, 20., 21, 22, 23, 26, 27, 28, 32, 34, 40, 48-51.
 CD or web: VisChem Animations: Nucleophile/Electrophile Interactions: Nucleophilic Substitutions
 CD or web: Interactive Exercises: Reactions: Haloalkanes 2
 Web: Curly Arrows: Eliminations Reaction
Web: Q & A Chapter 7. Due October 25.
- 8 Problems: 1-18, 19, 20, 24, 25, 28, 29, 30, 32, 37, 42, 51-54.
 CD or web: Interactive Exercises: Nomenclature: Alcohols
 CD or web: Interactive Exercises: Reactions: Alcohols
Web: Q & A Chapter 8. Due November 1.
- 9 Problems: 1-22, 23, 24, 25, 28, 30, 32, 34, 35, 42, 44, 49, 54, 63, 66
 CD or web: Interactive Exercises: Nomenclature: Ethers
 CD or web: Interactive Exercises: Reactions: Ethers
Web: Q & A Chapter 9. Due November 12.
- 10 Problems: 1-12, 19, 20, 21, 22, 23, 25, 26, 30, 35, 39, 40, 45, 48
Web: Q & A Chapter 10. Due November 29.
- 11 Problems: 1-8, 10, 12-17, 18, 19, 21, 22, 28, 29, 32, 34, 36, 52-55.
 CD or web: Vischem Animations: Structure and Bonding: Molecular Representations: Ethene
 CD or web: Interactive Exercises: Nomenclature: Alkenes, Cycloalkenes
Web: Q & A Chapter 11. Due December 6.
- 12 Problems: 1-11, 12-19, 24, 26, 28, 30 (not 30e), 33 (not 33f, p) 38, 42, 45, 58-62
 CD or web: Interactive Exercises: Reactions: Alkenes
 Web: Curly Arrows: Reactions of Alkenes
 Web: Q & A Chapter 12. These quizzes will not be graded.

Quizzes

The web problems below must be turned in for a grade sending by them to my E-mail address (DKingston@vt.edu) from within the web site. The web site operator sends the quiz results to me every Friday, so the deadline for submission of the quizzes for a grade is Thursday at midnight (except for the set for chapter 9, due Monday of the following week). I do not know when on Friday the grades are sent to me, so you may be able to get away with taking the quiz on Friday morning, but you should try to submit them on Thursdays to be on the safe side. *Quizzes that miss the Friday E-mail will not be counted.*

Web: Q & A Chapter 1.	Due September 6.
Web: Q & A Chapter 2.	Due September 13.
Web: Q & A Chapter 3.	Due September 20.
Web: Q & A Chapter 4.	Due October 4.
Web: Q & A Chapter 5.	Due October 11.
Web: Q & A Chapter 7.	Due October 25.
Web: Q & A Chapter 8.	Due November 1.
Web: Q & A Chapter 9.	Due November 12.
Web: Q & A Chapter 10.	Due November 29.
Web: Q & A Chapter 11.	Due December 6.