CHEM 2410-300 ORGANIC CHEMISTRY I
FALL 2013

Class	TTh 11-12:15 pm, Dell 2 Room 103
Discussion	Tues 7-9 pm, Dell 1 Room 103
Instructor	Cassandra L. Fraser, Chem 123, fraser@virginia.edu, 434-924-7998
Office Hours	TTh 1-3 pm
TA	XX
Office Hours	XX
Website	See Collab > CHEM 2410-300
Textbook	Bruice, *Organic Chemistry,* 7th edition (Study Guide optional)
Online Problems	Mastering Chemistry

COURSE DESCRIPTION

Organic Chemistry is a powerful visual and conceptual language that helps to explain some of the most interesting and important materials and processes in the world around us. When it comes to food, clothing, and shelter, everyday objects and sophisticated technologies, the designed and natural environment, and health, medicine and life itself, Organic Chemistry is key. Many people think that organic chemistry is just for premeds and certain kinds of chemists, but in fact, it's for everyone. It simply takes patience and persistence to analyze molecules and master the various ways of depicting molecular structure. With a few basic concepts in mind, it is possible to predict reactivity, product outcome, and design a synthesis. With practice and some tools and techniques in hand, it is possible to run reactions, test ideas, and actually make new things. With knowledge of organic chemistry you can understand why things happen and have the properties that they do. You can play a more informed and inspired role when it comes to appreciating, explaining, designing, making and using things in the world in and around us.

LEARNING OBJECTIVES

- Master basic principles of molecular structure
- Analyze molecules and predict, depict and explain reactivity
- Apply foundational knowledge to solve problems
- Explore cutting edge science and the history of discovery
- Appreciate how powerful organic chemistry is in explaining interesting and important things in the world around us
- Dispel fear and prejudice about organic chemistry in self and others
- Consider what organic chemistry means for you and your future plans
- Gain awareness about your learning and benefit from working with others

TEACHING PHILOSOPHY

- Encourage and empower you to take charge of your learning
- Challenge you to aim for excellence and do your best
- Point you to a variety of resources that can assist you with your learning
- Provide you with unique learning experiences
- Inspire in you a greater appreciation for chemistry
- Support you in reaching your goals

GRADING

- Goals/Introduction and Assessments: 3%
- Problems:
  - Warm up 5%
  - Practice 15%
  - Challenge 10%
- Special Projects: 10%
- Exams:
  - Exam 1 13%
  - Exam 2 13%
  - Exam 3 13%
  - Final Exam 18%

COURSE COMPONENTS AND HOW TO DO WELL IN ORGANIC CHEMISTRY

Goals and Introduction, Midterm and Final Assessment

Goals and Introductions: For learning to be meaningful it is important to know more about who you are, why you are here, what you bring to the class, and what you aim to achieve. Rather than leave it to chance or only get to know students gradually over time, I have found that it is much better to get to know everyone from right from the start. This also helps me to highlight certain aspects of the class and tailor them to your interests. The *optional Myers Briggs test* can help you to be more aware of your preferences for learning and working for others. This can provide insight about ourselves preferred tasks and roles on teams, remind us that other people are different, and hopefully foster tolerance, respect, and that everyone has something to contribute and everyone has important roles to play. I encourage you to discern and foster these special qualities in yourself and others this semester.

Midterm Assessments: We will take stock along the way throughout the semester to see how you are doing, whether you are meeting our goals and what can be do to improve. Midterm we will also provide you with your provisional grade for the class, so you will know where you stand and can make plans for steady progress and improvement.

Final Assessment: At the end of the semester, after the final, you are given an opportunity to reflect on your learning, and how well you did in meeting your goals for the course. Note that this is separate from the departmental course evaluations.

***Goals and assessments will be managed by email. Your goals will be read by me and kept confidential. Themes and trends in midterm assessments will be summarized and addressed in composite. Teaching Resource Center staff may be engaged to assist. Final assessments will be not be read until after final grades are determined. I will only check to see if you have submitted a response.*

Readings and Other Resources

Reading the textbook is an essential part of learning. It is assumed that you are reading and consulting resources before class and coming to class prepared. Class time will be reserved for reviewing key concepts and various activities to support your learning. We will not repeat all book content in class. Supplementary resources associated with the textbook, available online, or otherwise are abundant and ever increasing and will also be recommended. You are encouraged to find and share good resources with the class. Don't forget that other people—classmates, more senior students, TAs, professors—are great sources of information and advice.

Problems

Learning organic chemistry takes practice and the best way to test your knowledge and improve your ability is to do problems. Just like in sports or playing an instrument it is important to do exercises. Repetition can really increase your skills. Three kinds of problems will be assigned.

Warm up questions: To help you stay on track with the reading and test your learning, some online warm up questions will be assigned and due by midnight the day before class.

Practice problems: It is recommended that you do these online problems to test your knowledge and see where you stand. Afterwards find friends and classmates to discuss. Problem sets will be posted on Monday and due the following Sunday at midnight.

Challenge problems: For these tougher, multistep problems that require you to synthesize your knowledge, it is recommended that you work in teams and submit your answers for grading as a group. These will be assigned during the week and due on Tuesday at 9 pm, at the end of discussion section.

***Note: Additional problem solving opportunities will arise in class activities and discussion sessions. No credit will be given for late problem sets.*

Class

Time during class will be used to review key concepts and engage in activities such as discussion and problem solving that support your learning. Attendance is required.

Discussion

Tuesday night discussion sections (7-9 pm Dell 1, Room 103) are reserved for collaborative problem solving sessions, workshops (e.g. how to, more practice, special topics) and review. Exams will also take place on Tues pm. Attendance is strongly recommended. This is another great opportunity to work in groups and get assistance.

Office Hours

You are encouraged to take advantage of office hours for extra help with the class. Conversation about your academic programs, future goals, broader interests and how to put the part together is welcome too. Pep talks are also available in office hours or by email as needed. If you are still stuck after giving it an honest effort yourself, seek help from classmates, the TA or me sooner rather than later.

Special Projects

Through the semester you will be given special opportunities to explore aspects of chemistry beyond traditional problem sets. Examples include chances to explore chemistry research, the history of discovery, "real world" applications of chemistry, medically relevant molecules, explaining chemistry to non-chemists, chemistry careers,

a nomenclature and ChemDraw workshop and more. You will be given a list of possibilities and guidelines at the start of the semester. More may be added throughout the semester as good ideas arise. One option will be to propose your own project idea (approval required in advance). Good ideas will be added to the list. Individual and group projects are possible. Some projects will be time sensitive, others you may choose and complete as you wish, paced throughout the semester. You may do as many of these as you want to enhance your learning. You may earn one point each for a maximum of ten points total throughout the semester. These will be graded pass/fail.

Exams

There will be three midterm exams and a final this semester. Midterm exams will take place on Tuesday at 7-9 pm in Dell 1, Room 103. Two hours will be provided. After the exam is graded and returned, you will be given an opportunity to win back up to half of the points that you lost by submit corrections for the problems that you got wrong. For this regrade, you are encouraged to work in teams. The final exam will be cumulative.

- Exam 1: Tues Sept 24, 7-9 pm, Dell 1, Room 103
- Exam 2: Tues Oct 21, 7-9 pm, Dell 1, Room 103
- Exam 3: Tues Nov 19, 7-9 pm, Dell 1, Room 103
- Final Exam: Tues Dec 17, 9-12 pm, Dell 2, Room 103

***Students with conflicts due to official University activities should make arrangements, at least five days in advance, to take exams prior to the scheduled time. Those who are unable to take an exam because of an emergency, such as illness, will be excused with a doctors note or official record and the grading formula will be re-weighted. No make up exams will be given. Regrade requests must be addressed by the following class period after exams are returned.*

IMPORTANT DATES (iCal available)

Aug 27	First Class (Tues)
Sept 1	Goals & Introduction due (Sun)
Sept 24	Exam 1 (Tues 7-9 pm)
Oct 1	Exam 1 Corrections due (Tues 9 pm)
Oct 6	Midterm Check-in 1 due (Sun 5 pm)
Oct 15	Fall Reading Day
Oct 22	Exam 2 (Tues 7-9 pm)
Oct 29	Exam 2 Corrections due (Tues 9 pm)
Nov 3	Midterm Check-in 2 due (Sun 5 pm)
Nov 19	Exam 3
Nov 26	Exam 3 Corrections due (Tues 9 pm)
Nov 28	Thanksgiving
Dec 5	Last Class (Thurs)
Dec 17	Final Exam (Tues 9-12)
Dec 20	Final check-in due (Fri 5 pm)

**Online problem sets due on Sunday at midnight.
**Challenge problems due at the start of class on the date indicated.
**Other deadlines: Add: XX. Drop: XX. Withdraw: XX.

COURSE TOPICS

(subject to change)

I. Introduction to Organic Chemistry
- A. Nomenclature and Functional Groups
- B. Structure, Bonding and Physical Properties (1.1-1.15; 2.9)
- C. Acids and Bases (1.16-1.27)
- D. Introduction to Chemical Reactions (3.6-3.9)

II. Alkanes
- A. Structure (Ch 2)
- B. Stereochemistry (5.1-5.17)
- C. Reactions (12.1-12.6; 12.11-12.13)

III. Alkenes
- A. Structure (Ch 3.1-3.5)
- B. Reactions (Ch 4; 12.7-12.8)
- C. Stereochemistry (5.18-5.21)

IV. Alkynes (Ch 6)

V. Delocalization, Resonance and Molecular Orbital Theory (Ch 7; 12.9, 12.11)

VI. Substitution (Ch 8)

VII. Elimination (Ch 9)

VIII. Substitution and Elimination: More Examples
- A. Alcohols, Amines, Ethers, Epoxides, and Sulfur Compounds (Ch 10, 12.10)
- B. Organometallic Compounds (Ch 11)

IX. Aromatic Chemistry
- A. Aromaticity, Reactions of Benzene (Ch 15)
- B. Reactions of Substituted Benzenes (Ch 16)

**Corresponding textbook readings indicated in parentheses.
**An interactive syllabus is provided online on Collab.