

# CHEMISTRY 262

## ORGANIC CHEMISTRY I

Summer 2006 / Session A / May 30 – June 30

10:00 - 11:45 AM MTuWTh – Morrill Hall 10 (MO 10)

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### COURSE DESCRIPTION

You are here to learn the subtle science and exact art of potion- and elixir-making (a.k.a. organic chemistry). In that perspective, **CHEMISTRY 262** is the first of a two-part Introductory Organic Chemistry lecture course that focuses on the study of the chemistry of carbon-containing compounds. We will investigate the underlying physical principles of the reactions of these compounds. There will be a special emphasis on bonding theory, acid-base principles, the functional groups, stereochemistry, reaction mechanisms, and the development of synthetic schemes. As there is little foolish wand-waving here, many of you will hardly believe this is magic; but it is!

**Spectroscopy ( $^1\text{H}$  &  $^{13}\text{C}$  NMR, IR, MS, and UV-Vis), a means to gather information about the structure of molecules by making physical measurements on compounds, will also be studied. Spectroscopy will be taught in the context of the laboratory component of **CHEMISTRY 260**, the lecture & laboratory course, and **it is expected that EVERY student registered in CHE 262 will attend the three Organic Spectroscopy lectures (June 13, 20, & 22, 1:00-5:00 PM).****

**It is also expected that everyone enrolled in this course has a working understanding of the material covered in CHE 120 & CHE 121, or the equivalent.**

### REQUIRED SUPPLIES

- *Organic Chemistry: Structure and Reactivity*, Fifth Edition, Houghton Mifflin Company, 2004; by Seyhan N. EGE.
- *Study Guide for Organic Chemistry: Structure and Reactivity*, Fifth Edition, Houghton Mifflin Company, 2004; by Seyhan N. EGE, Roberta W. KLEINMAN, and Peggy ZITEK.



- **Avoid falling behind in the READING** –for those of you reading the book!
- **Attend most of the LECTURES, if not all.**

Remember, it's Summer Organic! We meet 8 hours a week in the classroom!

- **REVIEW the material after each lecture.**

Remember, it's Summer Organic! It goes fast, very fast! So, don't fall behind!

## CHEMISTRY 262 FORMAT

- **Hourly Exams.** *450 Points (~70% of Total Points)*

**THREE (3) hourly exams** will be administered, and each **hourly exam** will be worth *150 Points*. Also, **each hourly exam** will contain some problems chosen from the list of "Strongly Suggested Problems" (SSP) to do given in class, and taken from our textbook. The **THREE (3) hourly exams** will be administered during **THURSDAY** class time according to the schedule indicated below.

Exam #1 THURSDAY, June 8, 2006

Exam #2 THURSDAY, June 15, 2006

Exam #3 THURSDAY, June 22, 2006

**Hourly Exams MUST be taken at the indicated time.** As a rule, **MAKE-UP EXAMS WILL NOT BE GIVEN**; anyway, it's Summer Organic, there is **NO** time for Make-Up Exams! And I mean it! However, if you know in advance that you will not be able to sit for an exam –you better have a rock-solid reason!–, **PLEASE SEE ME** as soon as possible.

**Exam papers** will be returned during **MONDAY** lecture time, and any **request for a re-grade** will have to be made **within a 48-HOUR period following the return date.**

- **Non-Cumulative Final Exam.** *200 Points (~30% of Total Points)*

The **Final Exam** will be worth a total of *200 Points* and will not be cumulative. It will be the equivalent of a **fourth (4th) Hourly Exam**, and it will be administered **during the regularly scheduled last day of school of Summer 2006 / Session A.**

FRIDAY, JUNE 30, 2006: 10:00 AM – 12 NOON

- **Grading Policy.**

Cut-offs for exams and the course as a whole will be **in the vicinity of:**

A <sup>+</sup>	≥90%	A	≥85%	A <sup>-</sup>	≥80%	B <sup>+</sup>	≥73%
B	≥68%	B <sup>-</sup>	≥63%	C <sup>+</sup>	≥56%	C	≥51%
C <sup>-</sup>	≥46%	D <sup>+</sup>	≥39%	D	≥34%	D <sup>-</sup>	≥29%

F <29%

In other words, if you are targeting an **A** in this course, you will need to achieve at least  $0.85 \times (450 + 200 = 650) = 552$  **Points** of the **650 Total Points** available in this course; got it??? GREAT!!!

### **ACADEMIC IMPROPRIETY**

This polished euphemism needs to be brought up. 'Cheating' (and I hate to use this term, especially at this august institution) of any kind will not be tolerated, because it degrades the principle of meritocracy. Specific application to this course will largely cover the taking of exams and submission of exams for re-grading.

Verifiable improprieties while taking an exam (such as using unauthorized notes, or blatant examples of 'information exchange') will result in your receiving a mark of zero for that exam. The same holds true for submitting a forged or tampered exam for re-grading. Your graded exams may be photocopied for purposes of verification prior to being returned to you.

*A second incidence will result in your receiving a failing grade for the course, and the episode brought to the attention of a Dean of the College (this is **not** good).*

Further information and specific policies regarding academic impropriety at the University may be found in the *Student Handbook* and other University publications.

### **STUDENTS WITH DISABILITIES**

Students with disabilities who believe that they may need accommodations in this class are asked to contact the Disability Resource Center, located in Engleman Hall C-105A (EN C-105A), at (203) 392-6828 or (203) 392-6131 **as soon as possible** to better ensure that such accommodations are implemented in a timely fashion.

However, if you would like to speak with me about accommodations, or other concerns, such as emergency medical information, or arrangements in case the building must be evacuated, please make an appointment **as soon as possible**. My office location is in Jennings Hall, room 327.

## LECTURE OUTLINE

The following is a detailed outline of the material that we will **attempt** to cover this Summer / Session A in lecture.

### Introduction

- A. Line-Angle Drawings **5.9; Handout**  
(or Line Structures, or Skeletal Structural Formulas)
- B. The Functional Groups **p. 40; Handout**

### Unit #1: STRUCTURE & BONDING, PART I

- A. An Introduction to Structure and Bonding in Organic Compounds **1 (except 1.6)**
- B. Covalent Bonding and Chemical Reactivity **2**

### Unit #2: AN INTRODUCTION TO ORGANIC CHEMICAL REACTIVITY

- A. Reactions of Organic Compounds as Acids and Bases **3; 1.6; 16.1; 16.2; 16.3; 16.4**
- B. Reaction Pathways **4**

### Unit #3: STRUCTURE & BONDING, PART II

- A. Alkanes and Cycloalkanes **5; 19.1; 19.4**
- B. Stereochemistry **6**

### Unit # 4: KEY REACTIONS AND MECHANISTIC THINKING

- A. Nucleophilic Substitution and Elimination Reactions **7**

### Unit #5: FUNCTIONAL GROUPS AS A BASIS FOR STUDYING REACTIONS AND SYNTHESIS

- A. Alkenes **8; 25.6; 19.2; 19.3; 19.5**
- B. Alkynes **9**

## CHEMISTRY 260 LABORATORY OUTLINE

Day of . . .	Experiment
May 30th	<b>HELLO! GENERAL COMMENTS, SAFETY, &amp; CHECK-IN</b> #1 – Recrystallization & Melting Point Determination
June 1st	#2/Part I – MACROscale Fractional Distillation
June 6th	#2/Part II – Gas Chromatography (GC)
June 8th	#3 – MICRO- and MACROscale Liquid-Liquid Extraction
<b><u>June 13th</u></b>	<b><u>Spectroscopy Lecture:</u> NMR (Chap. 11)</b>
June 15th	#4 – Thin-Layer Chromatography (TLC)
<b><u>June 20th</u></b>	<b><u>Spectroscopy Lecture:</u> UV-Vis (Chap. 12: 12.1) &amp; IR (Chap. 12: 12.2)</b>
<b><u>June 22nd</u></b>	<b><u>Spectroscopy Lecture:</u> IR (Chap. 12: 12.2) &amp; MS (Chap. 12: 12.3)</b>
June 27th	#5 – Separation by Gas Chromatography (GC)
June 29th	<b>CHECK-OUT; GOODBYE! HAPPY 4th of JULY! SEE YOU NEXT WEEK!</b>

### AND LAST, BUT NOT LEAST

#### CELLULAR PHONES

**All cellular phones and pagers and beepers and other devices of this type are STRICTLY FORBIDDEN in the lecture classroom (MO 10), ...unless TURNED OFF and KEPT AWAY.**

**Under NO circumstances are telephones to be answered or used to make a call in the classroom.**

**Students who ignore this policy will be asked to leave the classroom PROMPTLY, and will receive a grade of ZERO for ALL evaluations to be carried out during that time.**

**If you are on call for work related emergencies or personal reasons, switch all devices to a mode that will not disturb the class (*i.e.*, vibrate mode), and inform the instructor prior to class.**

**There will be a ZERO tolerance in this course with regard to the use of telecommunication devices, and the rules stated above will be STRICTLY ENFORCED.**