

CHE 275 Organic Chemistry I

Fall 2009

- Instructor:** Professor Yan-Yeung Luk
Office: Center for Science and Technology (CST) 3-048
Phone: 3-7440 Email: yluk@syr.edu
Office Hours: Mon 2-4 PM, or by appointment
- Lectures:** MWF 10:35-11:30 am, Life Sciences Building (LSB) 001
- Required Texts:** Solomons•Fryhle, "Organic Chemistry" 9th Edition.
Binder-ready text, hard copy of SG/SM, model set, WileyPLUS,
all in one – available at the Bookstore.
- Clicker:** Interwrite PRS Personal Response System. (\$20 rebate available)
- Course Webpage:** <http://edugen.wiley.com/edugen/class/cls118491/>
Important: Make sure to register on this website. Registration code is included in the textbook package. Homeworks will be given through the website.
- Teaching Assistants:** For Office Hours:
Troy Lam, Email: tmlam@syr.edu, **LSB 124**
Office Hours: Wednesday 7-9 PM, Thursday 1-3 PM, and by Appointment
- For Recitations:
Dennis Viernes, Email: drvierne@syr.edu, 4-035 CST
Andrew (Andy) Basner, Email: adbaser@syr.edu, 3-028 CST
- Recitation Times and Locations**
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| Monday 5:15-6:35 PM | LSB 105 (Dennis, drvierne@syr.edu) |
| Monday 2:15-3:35 PM | CST 1-019 (Dennis, drvierne@syr.edu) |
| Tuesday 2:00-3:20 PM | Lyman 126 (Andy, adbaser@syr.edu) |
| Tuesday 5:00-6:20 PM | BH 111 (Andy, adbaser@syr.edu) |

The recitation sections are time periods, in which the TAs will present and discuss solutions and problems, review the lecture materials, and answer questions related to lecture material, assigned readings and homeworks. *Attendance to recitation is mandatory for any students who find organic chemistry difficult, and thus will be recorded by the TAs.* Questions during recitation sections are highly encouraged. Bad questions (or what you imagine to be bad questions) will not hurt your grade for this course. Students are also allowed to attend additional sessions that are not assigned to them. During exam weeks, recitations will function as review sessions.

Course description.

Organic Chemistry I (CHE275) – the first course of a two-semester sequence – introduces the science of molecules (small molecules) and reactions that are relevant to life.

As it turns out, molecules pertaining to life on earth are carbon-based along with mainly a few other elements, including hydrogen, oxygen, nitrogen and phosphorus. These elements make up the essential molecules relevant to life: carbohydrates (make up by carbon plus water, water is made up by hydrogen and oxygen), proteins (make up by the same elements as that of carbohydrates, plus a few sulfur), nucleic acids (make up by the same elements as of protein, plus lots of phosphorus, but without sulfur). Not that other chemicals, say sodium chloride, are not necessary for life, but that their involvement in life is not as direct as the elements and molecules categorized in organic chemistry. In addition, nearly all the drugs and abusive substance are organic molecules.

Students: two things to keep in mind when you get into studying these molecules and their reactions that are the basis for life and drug synthesis. First, knowledge from general chemistry is needed for organic chemistry. Although materials from General Chemistry (CHE106/116) will be reviewed and covered in detail, students need to be proficient rather than being novices with that knowledge. Second, learning organic chemistry undertakes both abstract and pictorial thinking. Being diligent on both ways of thinking will make learning organic chemistry easy and highly enjoyable. An example of abstract thinking would be “if $1+1=2$, then how much $34+97$ equal to?” Learning organic chemistry will be somewhat more difficult than this example. An example of pictorial thinking would be constructing a highrise building with all the details in your mind. Learning organic chemistry at the undergraduate level is easier than this example.

Examinations. Three one-hour examinations (100 points each) and a cumulative final exam (200 points) will be held during the regular class period. Materials to be covered in the exam will be announced. Scores for the exam will normally be posted by the following week; the exams can be picked up in the chemistry office (CST 1-014).

Grading. The average of the three exam scores will count 50% of the final grade, the final exam counts for 30%, online homeworks through WileyPLUS counts for 15%, and clicker response counts for 5%. If you miss an examination or other assignment, you receive a “zero” unless you have legitimate reasons with documentations.

Problem Sets. Homework will be assigned through WileyPlus. Due date will show up in the WileyPlus. These homework will be graded online and provide instant feedbacks. Additional problem sets will be distributed, which consist of selected problems from the text in addition to supplemental problems. These additional problem sets will not be collected or graded; their purpose is to serve as an ongoing assessment of your understanding of the subject matter. In addition, these exercises represent a rough approximation of the scope and difficulty of problems that you will encounter on the exams; many of the problems from last year’s exams will appear on the weekly problem set. Solutions to problems will be posted on the Friday following distribution.

Office Hours. In addition to my office hours, Troy Lam (our teaching assistant) also has scheduled office hours, details listed above. The recitation TAs, Dennis and Andy, will synchronize with Troy on teaching materials, so students can ask any questions during my and Troy's office hours. The TAs for the other section taught by Professor James Kallmerton (Laura Bateman, Chris Osier and Dakin Sharum) are also available to meet with students from my section during their office hours.

Academic Honesty. Students are highly encouraged to engage in discussion and help each other in learning organic chemistry, but NOT in any form of copying homeworks or cheating in the examinations. Syracuse University takes cheating and compromising any other forms of academic integrity very seriously. For your information, University's Academic Integrity Policy is posted at <http://academicintegrity.syr.edu>

A note on the academic integrity of the professors. When a professor accepts late homeworks, carries out unjustified make up examinations, or gives out easy grades in any form due to student's begging or other excuse, that professor is likely compromising his or her own academic integrity. Because in doing so, other students have not been served fairly; their effort and tuition are essentially compromised, the academic standard of Syracuse University is also compromised. As such, if you have any special request such as to do a makeup exam, you should do so in writing (email ok, but I may request from you a signed word document) with legitimate documentation such as medical or other emergency. With legitimate and HONEST reasons, I will help (and have helped) students as much as I can.



Internet for CHE275 Professor Luk



- Students enrolled for CHE275 will use WileyPLUS as the online tool for **Homework, instant feedback and grades on your homework, and track your own progress.**
- You can also access for The complete online textbook, Extra study aids and other evolving internet tools.

Registration Code

- *WileyPLUS* access code is in the Bundle (Binder-ready text, hard copy of SG/SM, model set, WileyPLUS) you purchased at the Bookstore
- If you prefer to only use the online version of your text in WileyPLUS go to: www.wileyplus.com/buy and save 60% off the price of the print text!

Getting Started

Register for *WileyPLUS* Immediately :

- **COPY AND PASTE** the URL listed below into your browser.
- Click the **REGISTER** button to start.

Class Section Name	Class Section URL
CHE275-Professor Luk - Fall 09	http://edugen.wiley.com/edugen/class/cls118491/

- Need help registering?
<http://www.wiley.com/college/twomin/stu/register.html>

WileyPLUS Help

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Additional Resources:

www.wileyplus.com
www.wileyplus.com/support
www.wileyplus.com/studentfdoc

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Chapter 1.

Aug	31	First day of class. Overall Introduction & Practice on Using Wiley
Sept	2	Octet Rule, Lewis Structure, Electronegativity, Ionic versus covalent bonds
	4	Formal charges and Oxidation states
	7	No Class (Labor Day)
	9	Atomic and Molecular Orbitals, Hybridization,
	11	Hybridization, Resonance, Inductive Effect
	14	VSEPR theory, Molecular Geometry, Drawing Organic Molecules

Chapter 2

	16	Non-polar and Polar Bonds, Functional Groups
	18	Physical Properties of Molecules, Infrared Spectroscopy
	21	No Class (Eid Ul-Fitr)
	23	*** <i>First Examination</i> ***

Chapter 3

	25	Classes of Organic Reactions, Drawing Electron Flow, Acid-Base Reactions
	28	No Class (Yom Kippar)
	30	Acid-Base Reactions, K_a , pK_a ,
Oct	2	Structure and Activity, Inductive Effect
	5	Organic Base, Structure and Activity, Energy of reactions
	7	Equilibrium and Standard Free Energy

Chapter 4

	9	Nomenclature, Hydrogen Deficiency and Physical Properties of Alkanes
	12	Conformational Analysis, Angle and Torsional Strain
	14	Axial and Equatorial Protons, Cis-Trans Isomerism, Some Example of Reactions
	16	*** <i>Second Examination</i> ***

Chapter 5

	19	Sinistral and Dextral Seashells, Chirality and Symmetry, Test for Chirality
	21	Constitutional Isomers and Stereoisomers, Enantiomers and assigning handedness
	23	Diastereomers and Resolution of Chiral Molecules

Chapter 6

	26	Nucleophilic Substitution Reactions, Nucleophiles and Leaving Groups
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	28	Kinetics of Nucleophilic Reactions, Mechanism of SN2 Reactions
	30	Transition State Theory (recall conformational analysis)
Nov	2	Carbocations and Mechanism of SN1 Reactions
	4	Elimination Reactions, E2 and E1
	6	Comparison of SN2 and SN1 Reactions and Review

Chapter 7

	9	Stability of Substituted Alkene, Carbocation and Molecular Rearrangement
	11	***Third Examination (Only up to Chapter 6)***

Chapter 8

	13	Addition of HX to Alkenes: Mechanism and Markovnikov's Rule,
	16	Hydration and Oxymercuration, Stereochemical consequence
	18	Mechanism of Hydroboration, Oxidation and Hydrolysis, Regio and Stereochemistry, Protonolysis of alkylboranes
	20	Electrophilic Addition of Bromine to Alkenes, Mechanism and Stereochemistry
	23	Carbenes, Oxidation of Alkenes: Syn 1,2-Dihydroxylation
	25	No Class (Thanks giving)

Chapter 9

	27	Introduction to Nuclear Magnetic Resonance, Chemical Shift, Coupling, Signal Integration
	30	Nuclear Spin, Shielding, Deshielding and Chemical Shift
Dec	2	Chemically Equivalent and Nonequivalent Protons, Spin-Spin Coupling
	4	Carbon 13 NMR Spectroscopy, DEPT 13C Spectra, and other 2-D NMR
	7	Mass spectroscopy, and Review

Introduction and overview of Chapter 11 and Chapter 12

	9	Alcohol and Ether
	11	Introduction to Carbonyl Chemistry, Acidity, Amide versus Ester
	14	Last day of Class Review

***Final exam.: Mon. Dec 21, 2:45 PM. Place: LSB 001.