

**CHEMISTRY 421/621
COURSE PACKET**

Fall, 2008

Gautam Bhattacharyya,
363 Hunter Labs, phone: 656-1356
gautamb@clemson.edu
OFFICE HOURS: TBA

Suggested Textbooks

Although there are no required textbooks for this course, from time to time you will need to reference standard organic texts. Here are some suggestions:

- Any sophomore-level textbook.
- *Advanced Organic Chemistry, Parts A and B*, by Carey and Sunberg.
- *Mechanism and Theory in Organic Chemistry*, by Lowry and Richardson.
- *Advanced Organic Chemistry*, by Michael Smith and Jerry March.
- *Organic Chemistry*, by Greeves, Warren, Wothers, and Clayden.

Class Schedule**Lectures:**

T and Th: 11:00 AM – 12:15 PM, 470 HUNTER

*Students may leave in 15 minutes if the professor or guest lecturer does not arrive in that time.***Course Goals**

The main objectives for this course are to help students understand:

- The connection between experiment and theory in organic chemistry; and
- The current research literature in organic chemistry.

These objectives will be achieved by:

- enhancing acquisition, retention, and use of knowledge;
- improving students' self-directed learning skills;
- developing students' intrinsic interest in subject matter and, subsequently, their motivation to learn;
- developing students' capacity to see problems from multi-disciplinary viewpoints, integrating information from many different sources;
- facilitating the development of effective collaborative learning practices;
- emphasizing for students the importance of learning for understanding rather than learning for recall; and
- improving flexible thought and the capacity to adapt to change.

Course Outline (Tentative)

<u>Week</u>	<u>Lect</u>	<u>Date</u>	<u>Day</u>	<u>Lecture Topic</u>
I	1	8/21	R	Course Introduction; Introduction to Bonding
II	2	8/26	U	Covalent Bonding
	3	8/28	R	Covalent Bonding; Acids and Bases
II	4	9/2	U	Problem-Solving Session I; PS I Out
	5	9/4	R	Acids and Bases
III	6	9/9	U	Kinetics and Equilibrium (<i>Dr. Brumaghim</i>)
	7	9/11	R	Kinetics and Equilibrium (<i>Dr. Brumaghim</i>)
IV	8	9/16	U	Problem-Solving Session II; PS I Due; PS II Out
	9	9/18	R	Kinetics and Equilibrium
V	10	9/23	U	Problem-Solving Session III; PS II Due
	11	9/25	R	Nucleophilic Addition Reactions (Ketones and Aldehydes)
VI	12	9/30	U	MIDTERM EXAM I
	13	10/2	R	Nucleophilic Addition-Elimination Reactions (Ketones and Aldehydes)
VII	14	10/7	U	Nucleophilic Addition-Elimination Reactions (Ketones and Aldehydes); PS III Out
	15	10/9	R	Nucleophilic Addition-Elimination Reactions (Carboxylic Acids and Derivatives)
VIII	16	10/14	U	Problem-Solving Session IV; PS III Due
	17	10/16	R	Nucleophilic Substitution and Elimination
IX	18	10/21	U	Nucleophilic Substitution and Elimination (Includes Reactions of Enolates); PS IV Out
	19	10/23	R	Electrophilic Addition Reactions (Alkenes)
X	20	10/28	U	Electrophilic Addition Reactions (Alkenes); PS IV Due
	21	10/30	R	Problem-Solving Session V
XI	22	11/4	U	FALL BREAK — NO CLASS
	23	11/6	R	Electrophilic Aromatic Substitution

CH 421/621

Fall, 2008

XII	24	11/11	U	Reactions of Alcohols
	25	11/13	R	MIDTERM II
XIII	26	11/18	U	Reactions of Alcohols; PS V Out
	27	11/20	R	Problem-Solving Session VI
XIV	28	11/25	U	Problem-Based Learning; PS V Due
	29	11/27	R	THANKSGIVING HOLIDAY — NO CLASS
XV	30	12/2	U	Problem-Based Learning
	31	12/4	R	Problem-Based Learning

NOTE: The problem-solving sessions, problem sets, and final project for this course will be performed in groups. Groups will be chosen by the second week of the course and will change after each exam.

COURSE POLICIES

Attendance

Although attendance will not be taken, you are required to actively participate during the class problem-solving sessions and problem-based learning sessions, which is part of your assessment for this course. Furthermore, you will be responsible for any announcements or course changes that are made in lecture.

Homework

Homework is due within the first 15 minutes of class on the day it is due. If any homework is up to a day late, 50% of the maximum points will be deducted from the score. If the homework is more than a day late, it will receive a grade of zero.

Homework assignments will be performed collaboratively and will be submitted as a group. A confidential evaluation sheet will be submitted by each group member assessing fellow group members' contributions. These assessments will be part of each member's homework grade.

Exams

Two midterms exam covering ALL the lecture material in this course will be given in class as listed in the LECTURE SCHEDULE on Pages 2 and 3.

A significant effort will be made to generate exam problems from the 2008 volumes of Organic Letters, Organic Process Research and Development, and JACS Communications relevant to organic synthesis.

No make-up exams will be given. If you miss the exam because of an *excused absence* (listed below), contact the professor in charge of the course so that arrangements can be made to possibly prorate that exam.

Final Project

In lieu of a final exam your group will submit a paper and presentation on a final project. For this project, your group will pick a reaction in the chemical literature whose mechanism is unknown, propose a set of possible mechanisms, and suggest experiments that would help ascertain the mechanism of your reaction. Details will be provided later in the term. The paper and oral presentation are due during the regularly-scheduled final exam period on **Wednesday, 10 December 2008, from 3:00 PM to 5:30 PM.**

Classroom and Testing Modifications

Any student eligible for changes in classroom and/or testing situations should discuss them immediately with the professor in charge of the course.

Excused Absences

The following are the **ONLY** acceptable reasons for missing an exam:

- A serious illness requiring medical attention. Your instructor *must* be able to verify that the student sought medical attention for a serious illness. Typical verification is a slip signed by the doctor who was consulted.
- Death of an immediate family member. Your instructor *must* be able to verify the death and the student's attendance at the funeral services.
- Travel *as part of a recognized University organization*. These travel plans must be discussed with your instructor **AT LEAST ONE WEEK BEFORE** they occur. *These excuses won't be handled after they occur.*

Regardless of whether absences are excused or unexcused, each student is responsible for all material in all parts of the course.

If you have an excused absence you will need to contact the professor in charge of the course no later than one week after the absence occurred.

Total Points

Homework Sets (5 @ 60 Points Each)	300 pts
Class Participation	150 pts
Midterm Exam I	120 pts
Midterm Exam II	180 pts
Final Project	<u>250 pts</u>
TOTAL	1000 pts

All regrades must be submitted in writing to the professor in charge of the course no later than a week after the graded assignment has been returned to you. Failure to do so will result in forfeiture of your ability to appeal your grade for that assignment.

Saving Graded Materials

Save all of your exams and homework sets until your final grade for the course is given.

Final Course Grades — CH 421 Students

Course grades will be based on total points earned, not on any specific assignment. At the end of the term the student with the highest number of points will be designated as the 100th percentile score, S_{100} . With that established, grades will be given on the following basis:

Total Score	Grade
$\geq .90 \times S_{100}$	A
$.80 \times S_{100}$ to $.89 \times S_{100}$	B
$.70 \times S_{100}$ to $.79 \times S_{100}$	C
$.60 \times S_{100}$ to $.69 \times S_{100}$	D
$\leq .59 \times S_{100}$	F

Final Course Grades — CH 421H Students

Course grades will be based on total points earned, not on any specific assignment. At the end of the term the student with the highest number of points will be designated as the 100th percentile score, S_{100} . With that established, grades will be given on the following basis:

Total Score	Grade
$\geq .90 \times S_{100}$	A
$.80 \times S_{100}$ to $.89 \times S_{100}$	B
$.70 \times S_{100}$ to $.79 \times S_{100}$	C
$.60 \times S_{100}$ to $.69 \times S_{100}$	D
$\leq .59 \times S_{100}$	F

Final Course Grades — CH 621 Students

Course grades will be based on total points earned, not on any specific assignment. At the end of the term the graduate student with the highest number of points will be designated as the 100th percentile score, S_{100} . With that established, grades will be given on the following basis:

Total Score	Grade
$\geq .90 \times S_{100}$	A
$.80 \times S_{100}$ to $.89 \times S_{100}$	B
$.70 \times S_{100}$ to $.79 \times S_{100}$	C
$.60 \times S_{100}$ to $.69 \times S_{100}$	D
$\leq .59 \times S_{100}$	F