CHEMISTRY 4-172       Advanced Organic Chemistry         Fall 2013

Time:       MWF 9:30 - 10:20 am; W228 CB

Instructor: Professor Hien Nguyen (Email: hien-nguyen@uiowa.edu)
Office: E433 Chemistry Building
Phone: 319-384-1887
Office Hours: Monday and Friday 1:00 - 2:30 pm or by appointment

Grader:    Jake Duncan (Email: andrew-duncan@uiowa.edu)

Textbooks: Advanced Organic Chemistry (Highly Recommended)
Molecular Model Set (Required)
Undergraduate Organic Chemistry Textbook (Highly Recommended)

Exams:
- MIDTERM I       Wednesday, 10/09 6:30 pm – 9:30 pm, W55 CB
- MIDTERM II      Wednesday, 11/13 6:30 pm – 9:30 pm, W55 CB
- FINAL EXAM      TBD

Grading:
- Unannounced Quizzes 100
- Problem Sets 240
- Seminars 60
- Midterm Exam I 100
- Midterm Exam II 100
- Final Exam 100

**Exams:** If you know that you will miss an exam, please inform me at least two weeks in advance and provide the appropriate written documentation. I will then rearrange the time that will fit into your schedule. All exams are cumulative including the final exam.

**Quizzes:** There will be unannounced quizzes at the start of the lecture over the course of the semester, but only the highest five quizzes will be counted in your final grade. There will be no make-up quizzes.

**Homework:** There will be six problem sets throughout the course of the semester, and they will be collected and graded. Although you are allowed to work together with your classmates, you are not allowed to copy point-to-point of other’s problem set.

**Seminars:** In order to receive credit for seminars, you MUST attend six seminars given by the invited speakers in the following departments or divisions:
   A) Chemistry Colloquium: Friday at 3:30 pm in W128 CB
   B) Organic Division Seminar: Thursday at 12:30 pm in
   C) Inorganic Division Seminar:
D) Analytical Division Seminar:
E) Physical Division Seminar:
F) Division of Medicinal Chemistry and Natural Products, College of Pharmacy
   Tuesday at 4:00 pm in S538 PHAR (Pharmacy Building)
G) Department of Biochemistry Seminar: Thursday at 10:30 am
H) Department of Microbiology Seminar: Tuesday at 3 pm in Bowen Auditorium
   or Thursday at 4 pm in 1110 Medical Education

After the seminar, you must write a half-page abstract and then electronically send
it to my email. In your abstract, you must include the name of the speaker, his/her
seminar title, and a brief summary of his/her research presentation. The abstract is
due within a week after you attend the seminar. I WILL NOT accept any abstracts
after one week of the seminar.

Course Administration: A majority of course business can be achieved at the Chemistry
Center, E225 CB. The hours are 8 AM -12 Noon & 12:30 – 4:30 PM on M-F, and the
contact person is Ms. Jessica Alberhasky (335-1341). The following issues SHOULD be
achieved at the Chemistry Center: drop/add forms, section changes, and TA office hours.

Complaints: complaints and appeals can be filed at the Department of Chemistry offices
located in E331 CB (335-1350).

Tentative Schedule:
Reading materials for this course – Handouts are posted on ICON

1. NEIGHBORING GROUP PARTICIPATION AND BALWIN RULES
   Inter- and intramolecular $S_N1$ and $S_N1$ reactions
   Neighboring group participation
   Baldwin’s rule for intramolecular ring closure

2. CONFORMATIONAL ANALYSIS OF ACYCLIC SYSTEM
   Acyclic sp$^3$- sp$^3$ system and sp$^2$- sp$^3$ system
   Allylic strain and amide conformation

3. STRUCTURE AND CHEMISTRY OF PROTEIN
   Protein Structure: amino acids and their conformation, protein folding
   Peptide Sequence: Edman degradation and mass spectrometry
   Polypeptide Synthesis: amide bond, protecting groups, and solid phase synthesis

4. CONFORMATION ANALYSIS OF CYCLIC SYSTEM
   Cyclohexanes and substituted cyclohexanes,
   Heteroatom-substituted six-membered ring
   Cyclohexenes and decalin system
5. STRUCTURE AND CHEMISTRY OF CARBOHYDRATES
   Structure of saccharides
   Protecting groups for carbohydrates
   O-glycoside synthesis
   Structure of glycopeptides and glycolipids
   Glycobiology

6. STRUCTURE AND CHEMISTRY OF DNA AND RNA
   Nucleic acid structure
   DNA synthesis
   DNA-damaging agents and drugs that target DNA

College Statement

Administrative Home: The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Questions may be addressed to 120 Schaeffer Hall or see the CLAS Student Academic Handbook [www.clas.uiowa.edu/students/academic_handbook/index.shtml].

Electronic Communication: University policy specifies that students are responsible for all official correspondences sent to their standard University of Iowa e-mail address (@uiowa.edu). Students should check this account frequently. (Operations Manual, III.15.2. Scroll down to k.11.)

Academic Fraud: Plagiarism and any other activities when students present work that is not their own are academic fraud. Academic fraud is a serious matter and is reported to the departmental DEO and to the Associate Dean for Undergraduate Programs and Curriculum. Instructors and DEOs decide on appropriate consequences at the departmental level while the Associate Dean enforces additional consequences at the collegiate level. See the CLAS Student Academic Handbook.

Making a Suggestion or a Complaint: Students with a suggestion or complaint should first visit the instructor, then the course supervisor, and then the departmental DEO. Complaints must be made within six months of the incident. See the CLAS Student Academic Handbook.

Accommodations for Disabilities: A student seeking academic accommodations should first register with Student Disability Services and then meet privately with the course instructor to make arrangements. See www.uiowa.edu/~sds/ for more information.

Understanding Sexual Harassment: Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. All members of the UI community have a responsibility to uphold this mission and to contribute to a safe environment that enhances learning. Incidents of sexual harassment should be reported immediately. See the University Comprehensive Guide on Sexual Harassment at www.uiowa.edu/~eod/policies/sexual-harassment-guide/index.html for assistance, definitions, and the full University policy.

Reacting Safely to Severe Weather: In severe weather, class members should seek appropriate shelter immediately, leaving the classroom if necessary. The class will continue if possible when the event is over. (Operations Manual, IV.16.14. Scroll down to e. h. and i.)