CHE 501, Fall 2003

Mechanistic and Synthetic Organic Chemistry: Fundamental concepts for organic chemistry structure, reactivity, reactions and reaction mechanisms.

**Time:** M, W, F, 8-8:50 AM  
Place: NSC Rm. 218  
Total Classes: 32

**Instructors**  
**Part I.** Richard Cheng  
e-mail: rcheng2@buffalo.edu  
office hours: TBA, NSC Rm.515  
phone: 645-6800 ext. 2158

**Part II.** Sherry Chemler  
e-mail: schemler@buffalo.edu  
office hours: TBA NSC Rm. 618  
phone: 645-6800 ext. 2136

**Textbooks:**  
Advanced Organic Chemistry, Parts A and B (required) Carey & Sundberg  
Advanced Organic Chemistry (optional) March  
Mechanism and Theory in Organic Chemistry (optional) Lowry & Richardson  
Transition Metals in the Synthesis of Complex Organic Molecules (optional) Hegedus  
Organic Chemistry Lecture Notes (optional, available from Scripps) Boger

If not in the bookstore, check out Amazon.com

**Computational Aids:**  
Everyone should learn how to use Beilstein, SciFinder and the Science Citation Index.  
Get familiar with electronic journals. Use the library’s website.

**Grading and Assignments**

First Test (20%), Midterm (25%), Second test (20%) and Final (comprehensive, 25%) and Final report (10%). Homework problems (assigned weekly) will be discussed during

**Final Report:** see attachment.

**Topics Covered. Part I** (Richard Cheng) 16 lectures  
Conformational Analysis  
Stereochemistry  
Acid/Base (Pka)  
Isotope Effects  
Aromatic Substitution
SN2/SN1/E1/E2
Solvent Effects
Orbital Alignment/Grobe Fragmentation

**Part II** (Sherry Chemler), 16 lectures
Reductions/Oxidations (2 lectures)
Carbonyl Additions: Stereochemistry, Catalysis, Aldol, Allylation, Glycosylation (4 lectures)
Olefin Additions, Elimination Reactions: Allylic Strain, Hydroboration (2 lectures)
Cross-Coupling Reactions, transition metal catalysis (2 lectures)
Pericyclic Reactions (1 lecture)
Sigmatropic Rearrangements (1 lectures)
Diels-Alder Reactions (2 lectures)
Free Radical Reactions (1 lecture)
Photochemical Reactions (1 lecture)