TENTATIVE SCHEDULE


II. Hybrid Orbitals and Covalent Bonding: Atomic and Molecular Orbitals, Hybrid Atomic Orbitals - σ and π Bonds, Conjugated versus Nonconjugated π Bonds, Bonding in Benzene and Resonance (Electron Delocalization), Drawing Resonance Structures.

III. Structural Effects on Acidity: Effects of Atom Hybridization, Effects of Resonance with π Systems, Effects of Resonance with Substituents Attached to π Systems.


V. Stereochemistry: Geometric Isomerism (cis and trans versus E and Z Designations), Conformations of Alkanes and Cycloalkanes, Chirality, Fischer Projections, Optical Activity, Absolute Configuration (R/S Assignments), Molecules with Two or More Chiral Carbons, Meso isomers and Conformational Enantiomers, Chiral Molecules without Chiral Carbons, Prochirality (Pro-R versus Pro-S Hydrogens, Enantiotopic versus Diastereotopic Hydrogens, Stereospecificity of Enzymes Towards Enantiotopic Hydrogens), Racemate Resolution.


VII. Free-Radical Reactions: Free-Radical Structures, Halogenations (Mechanism, Halogen Reactivities, Stereochemistry, Radical Stabilities and Selectivity, Selectivity of Bromine versus Chlorine and the Hammond Postulate, Allylic and Benzylic Bromination with NBS), Alkane Pyrolysis, Autoxidations with Oxygen (Conversion of Cumene into Phenol and Acetone), Inhibitors (Phenol, BHT, BHA, Vitamins E and C), Alkene polymerizations (Homopolymers, Copolymers, LDPE versus HDPE, Natta-Ziegler Type Catalysts).
VIII. **Alcohols:** Classification, Brief Review of Nomenclature, Acid-Base Reactions and formation of Metal Alkoxides, Nucleophilic Substitutions Reactions with HX, SOCl₂, and PBr₃ Sulfonate Esters (Preparation and Substitution Reactions), Sulfate and Nitrate Esters, Eliminations via Dehydrations and Sulfonate Esters, Oxidations with Chromates and Permanganates, Selective Oxidations with Pyridinium Chlorochromate (PCC), Biological Oxidations via NAD. Preparation of Organometallics (Grignard reagents and Alkyllithiums), Grignard Syntheses of Alcohols.

IX. **Ethers, Epoxides, Thiols, and Sulfides:** Nomenclature, Williamson Ether Syntheses, Epoxide Syntheses (Peroxycids with Alkenes and via Halohydrins), Nucleophilic Substitutions (Ether Cleavages with HX and Ring Opening of Epoxides), Crown Ethers, Thiol and Sulfide Syntheses, Oxidations of Sulfur Compounds.

**Quizzes and Exams:**

There will be four 1-hour exams (short-answer type, 100 pts. each). The first three exams will be in-class exams and are scheduled for Fridays: September 29, October 27 and November 17. The fourth exam will be during finals week, **10:15-12:15 Wednesday, December 20.** My exams are designed to test your ability to apply what you have learned, not to test your ability to simply regurgitate information. I will also be handing out a number of self-assessment quizzes throughout the semester.

**Review Sessions:**

I will hold seven evening review sessions during the term. These will be held in ChemSci 101 at **7:00-8:00 pm** on the following Wednesdays: September 20, September 27, October 11, October 25, November 8, November 15, and December 13.

**Grades:**

Your course grade will be determined by the percentage of the 400 possible total points earned. I do not have any set percentage-letter grade equivalencies, but from past experience, I expect the beginning percentages for A, B, C, and D to be the following: A ~ 84%, B ~ 72%, C ~ 50%, D ~ 40%.

**Problems:**

Selected in-chapter and end-of-chapter problems are assigned for each of the chapters covered and are listed below. In addition to the text problems, I will pass out my own problem sets as a form of review of the material covered. These will also provide examples of the type of questions you should expect to see on my exams. The problems will not be collected or graded. It is to your advantage to work as many of the assigned (and unassigned) problems as possible because working problems is the best way that I know for you to gauge your understanding of organic chemistry. If you truly understand how to work the problems assigned in the text and on the problem sets, you should have little (if any) trouble on the exams.
Assigned Problems

Chapter 1: 1.6, 1.8-1.11, 1.13b,d, 1.14, 1.15, 1.17, 1.18, 1.19a,b, 1.26, 1.27, 1.29b,c, 1.30-1.32, 1.34, 1.35, 1.37e,f, 1.39-1.41, 1.45-1.47, 1.51-1.53, essay.

Chapter 2: 2.4, 2.5, 2.9c, 2.10, 2.11, 2.13, 2.15, 2.16, 2.18, 2.19, 2.23, 2.24, 2.27, 2.28, 2.30, 2.31b,c,d,f, 2.32a,b,f, 2.33, 2.37, 2.38, 2.40, 2.42, 2.45, 2.46d,f, 2.47, 2.48, essay. Also 14.22-14.24, 14.25b, 14.25a,c-e.

Chapter 3: 3.2, 3.3, 3.7, 3.8, 3.9,3.16, 3.17b,c,d, 3.19, 3.22, 3.23, 3.24c,d,e,f, 3.25, 3.26a,c,d, 3.27a,c, 3.28, 3.30-3.32, 3.34, 3.37, essay.

Chapter 4: 4.1, 4.4-4.9, 4.15, 4.16, 4.20-4.22, 4.27, 4.28c, 4.29-4.31b, 4.32a,e, 4.33-4.35, 4.36b,c, 4.37d,e, 4.40, 4.42b,d,e, 4.43, 4.45, 4.46, 4.49-4.51, 4.53, 4.54a,c,e, 4.55, 4.58, 4.59, 4.64-4.67, 4.69, 4.70, essay.

Chapter 5: 5.1, 5.2, 5.6, 5.7, 5.10, 5.11, 5.14, 5.15b, 5.18, 5.20, 5.23-5.27, 5.29, 5.31-5.39, 5.41, 5.42, 5.44-5.49, 5.52, 5.54, 5.55, 5.58b,c,d,e, 5.59, 5.61, 5.62, essay.

Chapter 6: 6.5-6.10, 6.16-6.21, 6.22a-d,f, 6.23, 6.24b, 6.25, 6.26a,b,d, 6.27b,c, 6.28, 6.30, 6.32, 6.33, 6.35, essay.

Chapter 7: 7.1, 7.3, 7.7, 7.9b, 7.11, 7.13, 7.22a,e,g,h, 7.24, 7.25a,c, 7.27, 7.28, 7.33, 7.35, 7.36, 7.40a-c, 7.41a,b,f,i, 7.42a,c-f, 7.43a,g-i, 7.44, 7.46, 7.47c,d, 7.48, 7.49, 7.51b, 7.52-7.55, essay.

Chapter 8: 8.1a,c,d, 8.3b,d, 8.6, 8.7a, 8.12, 8.13-8.25, 8.27, essay.