CHE 173: Mechanistic Organic Chemistry II
Syllabus, Winter Quarter 2005

Instructor:

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Course Description:

This is the second in a sequence of courses designed to investigate what organic chemistry is and how it works, by emphasizing the relationship between structure and function of organic molecules. Our primary objective for CHE 173 is to expand on the foundation established last quarter and continue to build on our knowledge of organic chemistry. Everything about this subject is comprehensive, and so it is very important that you not fall behind with the material. Unlike some other courses, it is very difficult to "cram" for organic chemistry at the end of the quarter. The best strategy for success in this course is to stay on top of the material. The schedule is outlined below and we will stick to this as closely as possible. Please read the assigned sections of the text before you come to class.

Texts:

Organic Chemistry 5th ed. by Carey and *Multiscale Operational Organic Chemistry* by Lehman

Weekly Routine:

Monday	Tuesday	Wednesday	Thursday	Friday
9:30-11:30 Office Hours		9:30-11:30 Office Hours	9:30-11:30 Office Hours	9:30-11:30 Office Hours
12:00-1:00 Quiz		12:00-1:00 Lecture	11:50-12:50 Lecture	12:00-1:00 Lecture
1:00-5:00 201 Lab (Dr. Dintzner)	1:00-5:00 202 Lab (Dr. Kharas)	1:00-5:00 203 Lab (Dr. Kharas)	1:00-5:00 204 Lab (Dr. Dintzner)	1:00-5:00 205 Lab (Dr. Shelby)

Homework, Specific Objectives, Practice Quizzes,
Weekly Quizzes and Final Exam:

Problems from the book will be assigned at the end of each class for you to do at your own pace; they will not be collected or graded, but it is in your best interest to work through the problems. A list of specific objectives will be posted prior to each weekly quiz to make it clear what you're expected to know or understand on a weekly basis. In addition, a practice quiz will also be posted on-line at least four days prior to each weekly quiz to give you an idea of what to expect on the upcoming quiz and also for you to gauge your understanding of the material. The practice quizzes are for your own benefit and will not be collected or graded, but again, it's in your best interest to work on them to exercise your understanding of the material. Homework, specific objectives and practice quizzes are all tools for you to use to help you learn the material. Your understanding of the material will be assessed through weekly quizzes and final exam. Because everyone can "have a bad day," the lowest quiz score will be dropped.

Grades:

Final grades will be based on your performance on weekly quizzes (50%), the final exam (25%) and in lab (25%), broken down as follows:

Component	Points
Weekly Quizzes (8 @ 50 points)	400
Final Exam	200
Lab Reports (7 @ 25 points)	175
Lab Final Exam	20
Notebooks/TA Assessment	5
Total	**800**

800-720 = A-range
719-640 = B-range
639-560 = C-range
559-480 = D-range
Less than 480 = F

Academic Dishonesty:

Any violation of the academic honesty policy in the classroom, during quiz section, or in the laboratory is extremely serious and will be dealt with as required by the university. Please refer to the appropriate sections of the student handbook for the policy.

Tentative Schedule:

Date		Reading	Topics
M	1/3	13.1-2 & 13.20	Introduction to spectroscopy; IR spectroscopy
W	1/5	13.21-13.23	UV-Vis Spectroscopy and Mass Spectrometry (MS)
TH	1/6	13.3-13.5	Introduction to ^{1}H NMR spectroscopy
F	1/7	13.6-13.9	Interpreting ^{1}H NMR spectra, spin-spin splitting
M	1/10	**Quiz 1**	
W	1/12	13.10-13.13	Finishing up ^{1}H NMR spectroscopy
TH	1/13	13.14-13.16	^{13}C NMR spectropscopy
F	1/14	13.18-13.19	2D-NMR spectroscopy
M	1/17	**Quiz 2**	
W	1/19	10.1-10.4	Introduction to conjugation; allylic halogenation
TH	1/20	10.5-10.9	Classes, relative stabilities, bonding, and preparation of dienes
F	1/21	10.10-10.14	Reactions of dienes: hydrohalogenation, addition, Diels-Alder; MO analysis
M	1/24	**Quiz 3**	
W	1/26	11.1-11.4	Benzene, resonance, and resonance energy
TH	1/27	11.5-11.9	Hybridization and MO analysis of benzene, nomenclature, polycyclic aromatics, and physical properties of arenes
F	1/28	11.10-11.14	Reactions of arenes 1: Birch reduction, FR halogenation and oxidation of alkyl benzenes, nucleophilic substitution in benzylic halides
M	1/31	**Quiz 4**	
W	2/2	11.15-11.17	Reactions of arenes 2: preparation and reactions of alkenylbenzenes; polymerization of styrene
TH	2/3	11.18-11.20	Anti-aromatic systems, Hückel's rule, annulenes
F	2/4	11.21-11.23	Aromatic ions and heterocyclic aromatics
M	2/7	**Quiz 5**	
W	2/9	12.1-12.8	Electrophilic aromatic substitution (EAS) reactions: nitration, sulfonation, halogenation, Friedel-Crafts alkylation and acylation. Synthesis of alkylbenzenes
TH	2/10	12.9-12.11	Rate and regioselectivity in EAS
F	2/11	12.12-12.18	Substituent effects in EAS; substitution in naphthalene and heterocyclic aromatic compounds
M	2/14	**Quiz 6**	

W	2/16	14.1-14.5	Introduction to organometallic compounds, organolithium reagents and Grignard reagents
TH	2/17	14.6-14.10	Synthesis using organometallic compounds; retrosynthetic analysis
F	2/18	14.11-14.15	Organo-copper, organo-zinc and other organometallic reagents; carbenes and carbenoids
M	2/21	**Quiz 7**	
W	2/23	15.1-15.5	Sources and preparation of alcohols and diols
TH	2/24	15.6-15.11	Reactions of alcohols
F	2/25	15.12-15.14	Reactions of diols, thiols; spectroscopic analysis of alcohols and thiols
M	2/28	**Quiz 8**	
W	3/2	16.1-16.8	Nomenclature, structure & bonding, and physical properties of ethers, epoxides and sulfides; preparation and reaction of ethers
TH	3/3	16.9-16.14	Preparation and reaction of epoxides
F	3/4	16.15-16.18	Sulfides; spectroscopic analysis of ethers, epoxides and sulfides
M	3/7	**Quiz 9**	
W	3/9	23.1-23.9	Aryl halides: properties and reactivity
TH	3/10	24.1-24.8	Phenols: properties and reactivity
F	3/11	24.9-24.15	Phenols: reactivity and analysis
W	3/16	**Final Exam** (11:45-2:00 p.m.)	