

Chemistry 325

Organic Chemistry I

Fall, 2008

Instructor: David Lewis

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My weekly schedule for this semester:

	Monday	Tuesday	Wednesday	Thursday	Friday
8-9	Research	325 lab B03	Research	Research	Research
9-10	Research	325 lab B03	Research	Research	Research
10-11	Class prep	325 lab B03	Class prep	Research	Class prep
11-12	Chem 325 B0B	Office Hrs	Chem 325 B0B	Office Hrs	Chem 325 B0B
12-1	DPC Mtg	Research	Faculty Mtg	Lunch	Seminar
1-2	325 lab B01	Research	Research	325 lab B02	Research
2-3	325 lab B01	Research	Research	325 lab B02	Research
3-4	325 lab B01	Research	Research	325 lab B02	Research
4-5	Office Hrs	Research	Research	Office Hrs	Out of Office

It may become necessary for me to leave early to complete doctor-ordered cardiac exercises, but we'll see how this works out for now.

Course Schedule: MWF 11:00-11:50 P 117

Textbook: "Organic Chemistry" 5th Edition, by Brown, Foote, Iverson & Anslyn (Brooks/Cole, 2009)

Purpose: This course is the first half of a two-semester course in organic chemistry including laboratory. In this course, we will begin the study of functional group chemistry that will be concluded in Chemistry 326.

This course addresses the following academic goals of the baccalaureate:

- an appreciation of the university as a learning community
- enhancement of the ability to inquire, think and analyze
- enhancement of the ability to write, read and listen
- an understanding of numerical data
- an understanding of science and the scientific method

Attendance Policy: It is in your own best interests to attend and participate in class. From time to time, a question may be asked in class, and the student answering (correctly or not) will be awarded bonus points. Attendance will be recorded, since we are required to keep attendance records for students obtaining financial aid, but your attendance will not be used in assigning your grade (except bonus points). Persons not attending the first lecture of the year may be dropped from the rolls and their space assigned to another student. Excessive absences will be reported to the Dean of Students. In the event of an absence, you are responsible for all material discussed, and all announcements and assignments made.

Quizzes: There will be ten 5-point quizzes that will count towards your grade. The total points allocated towards your final grade from quizzes will be 50 points (i.e. half the value of one 50-minute examination).

Assessment: Your grade in this class will be determined by your performance in examinations and quizzes as measured by the total points gained. *Individual examinations and quizzes will not be curved.* Three 50-minute examinations (and that means 50 minutes, not 51 minutes) will be held during class during this semester, and the final examination will be held on Thursday, December 18, 2008, at 10:00 a.m. All examinations will be in "free-form answer" format. The examination schedule is at right; arrangements to take exams at times other than those scheduled should be made prior to when the exam is scheduled.

Examination 1	Monday, October 1
Examination 2	Friday, October 31
Examination 3	Friday, December 5
Final Examination	Thursday, Dec. 18, 10:00 a.m.

You will be permitted to bring molecular models to examinations in a clear plastic baggie.

If you must miss an examination for a University-excused reason, see me to arrange an alternative. Examinations missed for excused absences may be made up by taking a make-up exam (but try not to miss: my make-up exams are, by student report, usually more difficult than the original in spite of my efforts to keep them at the same level of difficulty). If you are in doubt as to whether your absence should be excused, see the Office of the Dean of Students.

The total number of points possible in this course is 700 points: The final examination is comprehensive. You may replace your lowest 50-minute examination score with your percentage on the final examination if that improves your score (I think that if you show improvement on a comprehensive examination, you should be able to replace the results of one bad day)

Quizzes	50
Semester Examinations (3)	300
Final Examination	200
Lab contribution	150
TOTAL POSSIBLE SCORE	700

The point scores shown at right will be required to earn the letter grade indicated:

Grade	Point Score	Percent Score
A	600-700	85.7-100
B	490-599	70.0-85.6
C	380-489	54.3-69.9
D	265-374	37.9-54.2
F	0-264	0-37.8

Plus and minus grades *may* be assigned, but not necessarily. For students enrolled on a S/U basis, letter grades of C or higher will be recorded as an S, grades of C- or lower will be recorded as a U.

Statement on Academic Integrity

I consider any academic misconduct in this course as a serious offense, and I will pursue the strongest possible academic penalties for such behavior. The disciplinary procedures and penalties for academic misconduct are described in the UW-Eau Claire *Student Services and Standards Handbook* in the section titled, "Chapter UWS 14—Student Academic Disciplinary Procedures."

Special Requirements: Students in need of particular accommodations should feel free to discuss them with Dr. Lewis.

Reading Assignments

You will be expected to have read the following assignments *before* coming to lecture:

Date	Readings	Topic	Problems worth trying	Hwk due
9/3	§ 1.1-1.2C § 2.1	Course Intro; atomic structure; Lewis structures; Drawing organic molecules (line structures)	1.24-1.26; 1.28-1.29	
9/5	§ 1.2D-1.2E	formal charge; condensed structures	1.27, 1.30-1.36	
9/8	§ 1.3	functional groups	1.41-1.47	
9/10	§ 1.8	resonance	1.37-1.39; 1.48	
9/12	§ 1.4-1.5	molecular shape and polarity	1.50-1.54	Quiz 1
9/15	§ 1.6-1.7; 1.9	molecular orbital theory; valence bond theory	1.55-1.58	
9/17	§ 2.2-2.4	hydrocarbon structure & nomenclature	2.16-2.18; 2.26-2.30	
9/19	§ 2.5A	conformation (alkanes)	2.32-2.35	Quiz 2
9/22	§ 2.5B	conformation (cycloalkanes)	2.36-2.37	
9/24	§ 2.6	<i>cis/trans</i> isomerism	2.38-2.50	
9/26	§ 2.7-2.8	reactions and uses of alkanes	2.54-2.56	Quiz 3
9/29	No Reading	review before examination		
10/1	Examination #1			
10/3	No Reading	review of examination #1		
10/6	§ 3.1-3.3	chirality; <i>R/S</i> system	3.14-3.24	
10/8	§ 3.4-3.5	multiple stereocenters	3.25-3.32	
10/10	§ 3.7-3.9	properties of stereoisomers	3.9-3.10	
10/13	§ 4.1-4.3	introduction to acids and bases; pK_a ; equilibrium	4.8-4.16	Quiz 4
10/15	§ 4.4-4.6	thermochemistry; mechanism	4.17-4.24	
10/17	§ 4.6-4.7	effects on acidity; Lewis acids & bases	4.25-4.27	
10/20	§ 5.1-5.4	alkenes: structure, nomenclature	5.13-5.24	Quiz 5
10/22	§ 6.1-6.3C	electrophilic addition (HX)	6.14-6.15, 6.21, 6.22	
10/24	§ 6.3D-6.3E	electrophilic addition (X_2 , XY)	6.16-6.17, 6.21-6.29	
10/27	§ 6.3F-6.5	hydration and oxidation of alkenes	6.18-6.20, 6.36-6.40	Quiz 6
10/29	No Reading	review before examination		
10/31	Examination #2			
11/3	No reading	review of examination #2		
11/5	§ 6.6-6.7	reduction; stereochemical considerations	6.41-6.47	
11/7	§ 7.1-7.6	alkynes: intro, acidity, prep, addition of HX	7.8-7.11	
11/10	§ 7.7-7.8	hydration and reduction of alkynes	7.12-7.18	
11/12	§ 7.9	alkynes in synthesis	7.20-7.25	
11/14	§ 8.1-8.3; 8.6	alkyl halides; allylic halogenation	8.8-8.12; 8.22-8.26	Quiz 7
11/17	§ 8.4-8.5; 8.7	free radicals	8.13-8.17	
11/19	§ 9.1-9.3	nucleophilic substitution	9.10-9.17	
11/21	§ 9.4A-9.4D	S_N1 and S_N2 mechanisms	9.18-9.36	Quiz 8
11/26	§ 9.4E-9.5	complete nucleophilic substitution	9.18-9.36	
12/1	§ 9.6-9.8	elimination	9.37-9.46	
12/3	§ 9.9-9.11	neighboring groups; review before examination	9.47-9.51	Quiz 9
12/5	Examination #3			
12/8	No reading	review of examination #3		
12/10	§ 10.1-10.4	alcohols: intro & acid/base	10.14-10.17; 10.25-10.28	
12/12	§ 10.5-10.6	conversion to halides, alkenes, etc.	10.29, 10.30, 10.32-10.37	Quiz 10
12/18		FINAL EXAMINATION 10:00-11:50 a.m.		

Chem 325 Laboratory-Fall 2008

	Dates	Experiment
Lab 1	Sept 4, 8, 9	Check in, Safety, IR of functional groups, polymers
Lab 2	Sept 11, 15, 16	Computer Lab-Conformational Analysis Steam Distillation of Cloves or Cinnamon; IR of Steam
Lab 3	Sept 18, 22, 23	Distillation products
Lab 3/4	Sept 25, 29, 30	Lab Quiz: Structure & IR Naproxen isolation-Intro to Chirality and Polarimetry; Polarimetry; Extraction of Acids and Bases-Theory
Lab 5a	Oct 2, 6, 7	Extraction and Recovery of Ethyl Aminobenzoate
Lab 5b	Oct 9, 13, 14	Extraction and recovery of Benzoic Acid Fractional Distillation of Cyclohexane and Toluene
Lab 5c	Oct 16, 20, 21	Lab Quiz: Polarimetry, Equil & Acid/Base Chemistry
Lab 5d	Oct 23, 27, 28	Theory of Gas Chromatography, Start GC
Lab 6a	Oct. 30, Nov 3, 4	Bromohydrin Formation
Lab 6b	Nov 6, 10, 11	Mass Spectroscopy of Bromohydrin Products, Lab Quiz
Lab 7a	Nov 13, 17, 18	Kinetics of S _N 1 reactions: Lucas and Silver Nitrate Tests
Lab 7b	Nov 20, 24, 25	Alcohol Dehydration, GC analysis
Lab 7b	Dec 1, 2, 4	Alcohol Dehydration, GC analysis Lab Check Out
Lab 7b	Dec. 8, 9, 11	Lab Quiz: S_N1, E1

Safety Goggles

All persons in chemistry labs are required to wear approved chemical splash goggles (not glasses) while they or others are working with chemicals in lab.

Chemical splash goggles do not have any perforations or holes that might allow liquids to pass through to the wearer. Students should have goggles by the second lab period, preferably by the first period. Students who do not have goggles will not be permitted to work in lab.

All Students need to bring their own Lab Lock for their lab drawer.

Lab Drawers, Lost or Broken Glassware Policy

Students pay a deposit against possible lost or broken glassware at the beginning of the semester. Students are responsible for any glassware that they lose. The cost will be charged against their deposit card. Stir bars or spin vanes are the most frequently lost items. Students are also responsible for the cost of any broken mercury thermometers. Students will also be charged for the second and any additional pieces of pieces from the glassware kit that are broken. Most careful students get their deposit back at the end of the semester.

Text Microscale and Macroscale Techniques in the Organic Laboratory Pavia, et. al Chemistry 322 Laboratory Manual. Students should also consult their Chem 325 text (Brown, Foote, and Iverson) for other background information.

Grades

Students will be graded on homework and short writing assignments, quizzes, and results sheets for each experiment. Other practice problems may be assigned, but not collected or graded. An estimate of the point value of the assignments follows.

Results Sheets and written lab summaries	
Data Sheets for experiments	
Results graded for completeness, yield, purity	
Brief summaries	60 pts
Homework assignments	30 pts
Quizzes (4)	60 pts
Approximate Total Points	150 pts

Letter grades for Chem 325 will be assigned on the basis of a percentage of total points, of which lab points will contribute ~25% of the total points. The grading scale is given in your lecture syllabus.

Class Attendance Attendance at each lab period is REQUIRED. If you miss a lab for an unexcused absence, you will forfeit the points that could be earned from any data sheets based on the lab work that day, and from any homework or quizzes collected during that lab period.

If you miss lab three or more times with unexcused absences, you will fail Chem 325, even if you have enough points for a passing grade.

Make-up labs will be allowed only for excused absences, and if the student communicates with the instructor within 4 working days (The typical timeline for lab assignment deadlines and changes to the next lab experiment is about one week.) If you wish to make up a lab in one of the other sections you must have permission in advance.

Withdrawal from the Course Students who wish to withdraw from the course must check out of their lab drawers before the instructor will sign a withdrawal form. This must be done during a scheduled lab period or office hours. It is best to notify the instructor ahead of time, since class lectures, etc., will have priority over checkouts. Persons not checking out of their drawer will be assessed a twenty-five dollar fine, plus the costs of any missing glassware and equipment.