

ORGANIC CHEMISTRY CHEM 2320
Course Syllabus
Spring Semester, 2006

Course website address (course information, lecture notes, handouts, review questions, tests, extra homework and answers): <http://webct.utah.edu>

Instructor: Bub Carlson
Office: HEB 1340
Phone: please use e-mail
E-mail: mcarlson@chem.utah.edu
Office Hours: I am normally on campus from 8 – 4 and you are welcome anytime after 9:30. My class schedule is on my door. You can sign up for an appointment on my door or just stop by.

Class Times: MWRF 8:35-9:25 a.m., room HEB 2008
Quizzes and hour exams will normally be given alternate Thursdays.
For extra time on hour exams, work can begin as early as 7:30 a.m.
Wednesday class periods before tests will be review sessions.
Thursday class periods with no scheduled tests will be discussion sessions.

T 8:35-9:25 a.m., HEB 2004, extra weekly help session (Bub Carlson)

There will also be three additional supplemental instruction sessions per week by SI instructor at times to be determined after the first week of class.

SI instructor: Mark Dammann
markdammann2@hotmail.com

The Supplemental Instruction Program, called SI for short, is offered in this course to provide organized study sessions. These sessions are free and open to all students in the course and are led by an undergraduate who has done well in this subject area. Your SI leader will be attending classes, reading the material, and doing any relevant assignments to be prepared for the SI sessions. The purpose of SI is to see that each of you has the opportunity to do as well as you would like to in this course. **In SI sessions, we will review, organize, and clarify the material from lectures, teach you ways to develop effective study skills for this course, and help you prepare for exams.** Your SI leader will schedule 3 meetings per week convenient to the majority of your schedules. Attendance is voluntary, and you may attend as many or as few sessions as you like.

To help us determine the best times to offer SI and to assess your learning goals for SI, please complete the 5-minute online survey in the next couple of days. The online survey can be accessed at: www.studentvoice.com/utah/si.html **It is extremely important for the effectiveness of SI that you complete the survey. Even if you are**

[uncertain whether you will use SI, please complete the survey in case you decide to use SI later in the semester.](#)

At the end of the semester, please complete the post-survey also accessed at www.studentvoice.com/utah/si.html to provide us with feedback on your experience with SI. Your comments are valued and important to our ability to provide you with effective SI sessions that meet your needs. Let us know what worked well and what you would change!

Prerequisites: **No students should take Chem 2320 without a C or better in Chem 2310.**

Texts: *Organic Chemistry*, eighth edition by Solomons and Fryhle
Study Guide and Solutions Manual for Organic Chemistry, eighth edition by Solomons, Fryhle and Johnson

Lecture Topic and Test Schedule and Reading Assignments:

<u>Date</u>	<u>Lecture Topic</u>	<u>Reading Assignment</u>	
Jan	9	Introduction; infrared spectroscopy theory	79-87
	11	ir-examples	
	12	nmr-theory, chemical shift, integration	383-397
	13	nmr-coupling	397-406
	18	nmr-analysis and sample spectra; ^{13}C nmr	406-418
	19	Discussion session	
	20	Mass spectroscopy	418-439
	23	Allylic substitution; Dienes	577-596
	25	Review session	
	26	Quiz # 1 (chaps 2.16, 9)	
27	Visible-ultraviolet spectroscopy	596-603	
Feb	30	the Diels-Alder reaction; Conjugate addition	604-616
	1	Aromatic compounds	622-653
	2	Discussion session	
	3	Electrophilic aromatic substitution	664-678
	6	Substituent effects on EAS	679-692
	8	Review session	
	9	Quiz #2 (chaps 13-15.11)	
	10	Arene diazonium replacement reactions	963-972

	13	Aromatic sidechain reactions	693-709
	15	Review session	
	16	Hour Exam I (chaps 9, 13-15.11, 20.7-20.9)	
	17	Aldehydes and ketones; Nomenclature	716-720
	22	Synthesis of aldehydes and ketones	720-731
	23	Discussion session	
	24	Acetals and hemiacetals	731-738
	27	Imines and enamines	738-743
Mar	1	Review session	
	2	Quiz # 3 (chap 15.12–16, 16.1-7)	
	3	Cyanohydrins; the Wittig reaction	743-761
	6	Acidity of α -hydrogens; the Aldol condensation	769-790
	8	Enolate reactions; the Robinson annulation	791-804
	9	Discussion session	
	10	Carboxylic acids; Nomenclature; Acidity	813-823
	20	Acid preparations; Nucleophilic acyl substitution	823-828
	22	Review session	
	23	Hour Exam II (chaps 15.12-16, 16-17)	
	24	Acyl chlorides; anhydrides	829-832
	27	Esters; Lactones	832-838
	29	Amides; Lactams	838-845
	30	Discussion session	
	31	Proteins; Derivatives of carbonic acid	846-877
Apr	3	the Claisen condensation	878-885
	5	Review session	
	6	Quiz # 4 (Ch 18)	
	7	Alkylations of α -carbons; the Stork Enamine Reaction	885-912
	10	Amines; Basicity; Hormones and neurotransmitters	940-954
	12	Preparation of amines	954-961
	13	Discussion session	
	14	Classification tests of amines	962-976
	17	Reactions of amines; alkaloids	977-999
	19	Review session	
	20	Hour exam III (chaps 18-21)	
	21	Carbohydrates	1072-1102
	24	Polysaccharides, enzymes	1102-1111, 1200-1208
	26	Review session	

28 Final Exam (8:00-10:00 scheduled, can work 7:00-11:00;
Chaps 2.16, 9, 13-25)

Important Dates:

Last day to drop/delete class: Jan 19

Last day to withdraw: Feb 4

Homework assignments Solomons and Fryhle, *Organic Chemistry*:

Answers to these problems will be found in the *Study Guide and Solutions Manual*. Supplemental homework and review questions will also be handed out in class and some will be only posted on the web; answers to these will be posted on the web and placed in the library.

Jan	13	9.1,2, 8, 31
	23	13.3, 4
	30	13.11-15, 24, 29, 31; 9, 10, 36, 33 (opt), 34 (opt)
Feb	1	14.4, 5, 16 a-h, 18-28
	3	15.3, 5, 6, 7a-c
	6	15.9-14, 26, 27
	10	15.19, 29 a-e, h-k, 31, 32; 20.11-14, 26 a, c, f-m, 31 a-p
	13	15.15, 17, 18, 19, 29 a-e, h-k, 31, 32
	17	16.23
	22	16.3, 4 (omit c, e), 29 a-c, 30
	24	16.9-11
Mar	3	16.17
	6	17.2, 3, 7-9
	8	17.13, -19, 21, 22, 24-26, 28 (omit d, l, g), 29 (omit d, l, h), 30 (omit b, h), 31 a, b, 36 a-c
	10	17.24-26, 18.1
	20	18.6, 7
	24	18.20-24 (omit b)
	27	18.25, 26, 10, 11
	29	18.29, 14, 15, 16a, 29-31

Apr	3	19.1-6
	7	19.8, 15, 26 (omit a), 27, 22
	10	20.21 (omit e, f, i, l, o), 22 (omit f, g, m, n), 1
	12	20.4, 5, 7, 8, 23, 24
	14	20.27 (a-c), 28, 29, 32
	17	20.15, 16, 18, 20, 30 a-h

Point distribution for course:

Quizzes – 4 @ 25	100
Hour exams – 3 @ 100	300
Final exam	<u>200</u>
	600

Examination Policy:

There are no make-up quizzes or exams. Under certain circumstances students may take tests early or late. All tests will be given on Thursdays and returned the following Monday in class. Any student taking a test late must do so before they are returned in class. Come to HEB 1340 Friday or before 8:15 Monday morning to take the missed test. Any student who misses a test will receive a 0.

Errors unfortunately do occur on grading of tests. Always carefully check your test with the key located on the course website, or on reserve in the library. Questions about grading of an exam or quiz should be submitted before the next quiz or exam. Do not write on the test or it may not be acceptable for regrading.

Anyone caught cheating on an exam or quiz will be referred to the Dean for disciplinary action and should expect to receive an F in the course.

Final grade distribution by percentage of total points:

90-100	A	50-61.9	C
85-89.9	A-	45-49.9	C-
80-84.9	B+	40-44.9	D+
75-79.9	B	35-39.9	D
70-74.9	B-	30-34.9	D-
62-69.9	C+	below 30	F

Deals: At the end of the semester students can make a “deal” to drop one score--an hour exam, a quiz, or the quiz total—not any more. The purpose of the “deal” is to help students who may have had one uncharacteristically low test and to motivate students to study harder for the final. Students can select which score is to be dropped and should hand in their deal on a piece of paper on Monday, April 24, when the last hour exam is returned, but before 5 p.m. on Wednesday, April 26, the last day of class. Keep all your old tests because you will need the scores to make your deal.

After the score you select is removed, calculate a percentage of total remaining points. If you earn this percent or better on the final exam, that score is dropped. If you fail to earn this percent or better on the final exam then no score is dropped. There is no penalty for failing to achieve the deal. The deal/paper you hand in should include your grades, the grade dropped, and the target percent. Also include your e-mail address (legible, please) in case there is an error in your proposed deal.

Here is an example of the calculation. Suppose the following are your test scores and you choose to drop your quiz total:

<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q Tot</u>	<u>HEI</u>	<u>HEII</u>	<u>HEIII</u>	<u>Total Pts</u>	<u>% Entering Final</u>
10	20	21	14	60	80	71	84	295/400	73.8% / B-
10	20	21	14	x	80	71	84	235/300	78.3% / B

Thus you must get 78% or better on the final (200 pts) to make your deal.

You may further improve your grade with the final if you score higher than your deal goal. For example, suppose the student in the example above gets 81% on the final (a 162, a B+). This gives $235 + 162 = 397$ total points, or $397/500 = 79.4\%$. Since 80% is the B/B+ cutoff, and the final exam percent was more above the cutoff (+1%) than the total average was below the cutoff (-0.6%), the student will be given the higher grade, a B+.

Teaching philosophy and study strategy:

To do well, students should attend class and take very detailed notes. You should rely on your lecture notes rather than the text as your primary study resource. Lecture notes will be posted on the course website (this may not occur for several days after the lecture). The topics covered in lectures will follow the same order as the text. The lectures will focus on the most important aspects of the material with more emphasis given to the most important points. Examples used in lecture will be different from those in the text. **You will be responsible for everything covered in lecture, but not responsible for material that is covered in the text but not in lecture.** It is not possible to cover all the topics in the text. To get most out of the lectures, it is recommended you read the text before lecture, then reread the text in more detail after the lecture to make sure you understand all concepts. The lectures move quite rapidly, so reading the text before lecture will improve your comprehension. **Always go over your lecture notes within a day of the lecture.**

Any reactions covered in Chem 2310 which you need to use in Chem 2320 will be re-introduced. You are not automatically responsible for all reactions covered in Chem 2310.

Be sure to do all the assigned problems and check your answers carefully. Before you do any problems, first go over the concept involved and make sure you understand the concept and method for solving the problem. Always check the answer to each problem before you go on to the next, so that you don't learn and repeat incorrect methods. Pay attention to small details, because they may be a clue that you don't understand some concepts. The answers to text problems are in the study guide and answers to handouts will be both in the library (Marriott reserve) and on the web. Although test questions will be different from assigned problems and lecture examples, they will involve the same concepts. **It is not sufficient to look over examples of solved problems; you must practice solving problems yourself.** Rework any problems you did not get correct on the first attempt before the test.

It is imperative that you not get behind in the material. General chemistry was a review of high school chemistry and covered many different topics which could be approached in any order. Organic chemistry is all new material and builds on itself like a foreign language or calculus. If you do not understand the basic concepts thoroughly it eventually becomes necessary to compensate by memorizing, and there is too much material covered in the course to learn it through memorization. If you did not learn the basic material in Chem 2310, you should repeat the course before taking Chem 2320. Do not consider taking chem 2320 with a grade below C in Chem 2310. People who do well in this class are the ones who commit to spending many hours a week necessary to master the material. If you find you cannot make the necessary time commitment to get the grade you want, you might consider withdrawing from the course and taking it another semester when you can spend more time on it.

It is recommended you organize the material to facilitate learning. The best way to be able to predict products from a set of reaction conditions is to make note cards with reactant (written in a general form) and conditions on one side and preferred product on the other side. The best way to prepare for synthesis problems is to make up preparation sheets organized by functional groups with the same general reactions which were on the note cards. A good way to organize mechanisms (written in general form) is to put similar mechanisms on the same sheet (those involving carbocations or in acidic conditions, those involving carbanions or in basic conditions, and those involving free radicals).

Many students have been successful in studying with a partner or in a group. You can compare class notes with a study partner and come up with an improved set of lecture notes, you can discuss homework problems and create additional problems for each other.

There will be review sessions the day before every test. The review, discussion, and supplementary instruction sessions are an ideal time to clear up any questions you have about the lecture material and homework problems. **To get the most out of these sessions you should have tried to work all problems beforehand.** If these sessions do not answer your questions I will be happy to meet with you personally if you are having difficulty, and my goal is to help the maximum number of you finish this course with a good grade. The Department of Chemistry office (HEB 2020) also has a list of students who are willing to work as tutors should you feel you want additional help.

Supplementary problems will be handed out periodically as well as review questions before every quiz and exam. Old tests will also be made available for practice. Tests and answers to them will be on reserve in the library and posted on the web.

Other important points:

You are responsible for all information and announcements made in lecture. If you miss a lecture get notes and all announcements from another student. Please do not call your professor with questions about announcements made in class.

Lectures go fast so be prepared. You can read the text in advance of lectures so it will be easier to comprehend concepts. Each organic course must cover a standard number of chapters each semester, so it is not possible to slow down the lecture pace.

Fifty minutes will be allotted for quizzes, although they should not take more than twenty five minutes to complete.

Hour exams will be fair, but long. If you want extra time you can begin as early as 7:30. It will be necessary to know the material well to be able move quickly and accurately through all the exam questions in a limited amount of time.

Any student who does not do well on hour exam I is advised to withdraw from the course and to begin again another semester. The material on hour exam I is typical of all the concepts which follow. It is far preferable to have a W on your transcript than a D or an F! Hour exam I will be returned before the deadline for withdrawal.

The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations.