

Course Information
Chemistry 212
Spring 2015

Course: CHEM 212 meets Mondays, Wednesdays and Fridays from 11:00 a. m. to 11:50 a.m. in Room 109 of the Business Administration building.

Instructor: Allan D. Headley

Office: Science Building, 337

Office

Hours: Tuesdays, 1:00 p.m. to 2:00 p.m.; and Wednesdays 1:00 p.m. to 2:00 p.m.

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Texts:

- Your basic text is "Organic Chemistry" 8th Edition, L. G. Wade, Jr. Pearson Publishers; ISBN 978-0-321-76841-4.
- Your lab textbook is: "A Small Scale Approach to Organic Laboratory Techniques," Pavia/Lampman/Kriz/Engel, 2011, ISBN 978-1439049327;
- A chemistry model set is highly recommended.
- Chem 202: No textbook is required, but the instructor will assign problems.

Course description, objectives, and learning outcomes

In this course, compounds that have various functional groups will be introduced and their physical and chemical properties discussed. The reactivity of these organic compounds will be examined and used as starting compounds for the synthesis of larger molecules. An important aspect of this course is the development of successful strategies for the synthesis of large organic compounds from smaller organic compounds. In addition, various spectroscopic techniques will be used in this course, but the basics are covered extensively in lab. The basic principles of organic chemistry are discussed and applied to mechanistic and synthetic organic chemistry problems. The course is designed to develop and improve the student's ability to think and solve problems. Thus, a letter grade earned in this class not only reflects the student's knowledge of organic chemistry, but also reflects the student's ability to solve scientific problems based on available information, and to become a better scientist.

EXAMINATIONS

First Exam: Monday, February 16, 2015

Second Exam: Monday, March 9, 2015

Third Exam: Monday, April 6, 2015

Fourth Exam: Monday, April 27, 2015

Final Exam: Wednesday, May 13, 2015; 10:30 AM – 12:30 PM

Your course grade will be based on your lecture grade and your lab grade. Each course midterm exam is worth 100 points (16.25% of your final grade), a course comprehensive final American Chemical Society (ACS) Exam (10% of your final grade), and your lab is

worth 25% of your course grade. The key and score distribution will be posted on the bulletin board which is located in the hallway of the third floor – across from Room 351/352 (Science building). All exams will be closed books; pens, pencils and erasers are the only items that may be used during each exam.

MAKE-UP EXAMS

NO make-up exams will be offered. If you miss a midterm for a reason beyond your control, you may request in writing to be excused from that exam providing you have valid written documentation supporting your reason.

TUTORIALS

Tutorial sessions (CHEM 202) will be held Thursdays 1:00 PM-1:50 PM, Location: BA 340 and Fridays 1:00 PM-1:50 PM, Location: AG/IT 255. Tutorial questions will be handed out prior to each tutorial session and they are intended to mimic as closely as possible the examination questions. Students should set aside a specific block of time before each session to answer these questions. These tutorial questions are intended to give you an assessment of how well you comprehend the materials presented in lecture and also to indicate to you how you would perform on the examinations. Possible answers will be discussed during the tutorial sessions.

COURSE WITHDRAWAL

See the following website for more details about course withdrawal deadlines:
<http://www.tamuc.edu/admissions/registrar/academicCalendars/>.

REGRADE OF EXAMINATIONS

When you review your graded exams, be sure NOT TO WRITE anything on your exam in the case you discover that a grading error was made. Exam grading will be reviewed if you think an ERROR has been made, but ONLY if the following procedure is followed:

- (1) Write a very concise note explaining what you think the error in grading was. This must be specific as to the mistake, typically no more than two sentences.
- (2) SIGN a statement on the note that you attest that you have made NO CHANGES at all on the exam since it was returned to you.
- (3) Attach the note to the test and hand it in to the instructor NO LATER THAN ONE WEEK after the graded exam was returned.

The entire exam will be regraded and returned approximately one week after you handed it back in. Please note that photocopies may be made of the tests. These will be compared with tests turned in for regrade to assure that changes have not been made. You are allowed only one regrade for each midterm exam. There are no regrades for the final exam.

PREREQUISITES AND COREQUISITES

Prerequisite: Chem 211, Chem 1412 with grade of “C” or better or consent of the instructor. Corequisite: Chem 202. Note: Credit will not be given for both Chem 108 and 211.

TENTATIVE SYLLABUS

Date	TOPICS TO BE COVERED	READING ASSIGNMENTS
Wed, 1/21	Introductions, conjugated systems	667 - 677
Fri, 1/23	Allylic radicals and reactions	678 - 683
Mon, 1/26	Diels-Alder reactions	684 - 695
Wed, 1/28	Ultraviolet spectra	696 - 705
Fri, 1/30	Aromatic compounds	713 - 725
Mon, 2/2	Aromatic compounds	726 - 739
Wed, 2/4	Benzene: nomenclature and properties	740 - 745
Fri, 2/6	Aromatic compounds: reactions	756 - 774
Mon, 2/9	Aromatic compounds: Friedel Crafts reactions	774 - 784
Wed, 2/11	Aromatic reactions, nucleophilic substitution	784 - 796
Fri, 2/13	Aromatic compounds: reduction, other reactions	796 - 805
Mon, 2/16	Exam #1	
Wed, 2/18	Carbonyl compounds: structure, nomenclature	816 - 829
Fri, 2/20	Synthesis of carbonyl compounds	829 - 839
Mon, 2/23	Reactions of carbonyl compounds	839 - 849
Wed, 2/25	Reactions of carbonyl compounds	849 - 865
Fri, 2/27	Amines: properties, nomenclature	879 - 895
Mon, 3/2	Amines: reactions	895 - 907
Wed, 3/4	Amines: reactions	907 - 915
Fri, 3/6	Synthesis of amines	918 - 926
Mon, 3/9	Midterm Exam #2*	
Wed, 3/11	Carboxylic acids: nomenclature, properties	939 - 956
Fri, 3/13	Carboxylic acids, synthesis, reactions	956 - 967
Mon, 3/16	Spring break	Study
Wed, 3/18	Spring break	Study
Fri, 3/20	Spring break	Study
Mon, 3/23	Carboxylic acids, reactions	967 - 971
Wed, 3/25	Carboxylic acid derivatives, types and nomenclature	981 - 997
Fri, 3/27	Carboxylic acid derivatives, reactions	997 - 1006
Mon, 3/30	Carboxylic acid derivatives, reactions	1006 - 1013
Wed, 4/1	Carboxylic acid derivatives, reactions	1013 - 1027
Fri, 4/3	Carboxylic acid derivatives, reactions	1027 - 1034
Mon, 4/6	Exam #3*	
Wed, 4/8	Condensation reactions	1045 - 1060
Fri, 4/10	Aldol and Claisen condensations	1060 - 1070
Mon, 4/13	Aldol and Claisen condensations	1070 - 1082
Wed, 4/15	Ester synthesis	1082 - 1091
Fri, 4/17	Carbohydrates	1101 - 1112
Mon, 4/20	Carbohydrates	1112 - 1121
Wed, 4/22	Carbohydrates: reactions	1121 - 1140
Fri, 4/24		

Mon, 4/27	Exam #4*	
Wed, 4/29	Nucleic Acids	1140 - 1148
Fri, 5/1	Amino acids: properties and synthesis	1155 - 1169
Mon, 5/4	Amino acids and peptides	1169 - 1190
Wed, 5/6	Proteins and lipids	1169 - 1217
Fri, 5/8	Polymers	1222 - 1238
Wed, 5/13	FINAL EXAMINATION	

* Each midterm exam is cumulative, but will emphasize the material covered since the previous midterm exam.

SUGGESTED HOMEWORK PROBLEMS

Chapter 14:	29, 30, 33, 37, 38, 39, 41, 43, 51.
Chapter 15:	24, 25, 26, 27, 30, 31, 33, 37.
Chapter 16:	26, 27, 28, 30, 32, 33, 35, 36, 42.
Chapter 17:	44, 45, 46, 47, 51, 59, 69.
Chapter 18:	27, 38, 39, 41, 42, 47, 48, 50, 51, 53, 54, 66.
Chapter 19:	32, 33, 35, 36, 40, 44, 46, 57.
Chapter 20:	25, 27, 28, 29, 30, 32, 33, 35, 36, 39.
Chapter 21:	42, 44, 45, 47, 48, 49, 50, 51, 53.
Chapter 22:	60, 61, 62, 63, 65, 66, 67, 70, 73, 75.
Chapter 23:	52, 53, 55, 56, 58, 59.
Chapter 24:	32, 33, 34, 35, 42.
Chapter 25:	14, 15, 16, 17, 18, 19, 22, 24, 27, 28, 30.
Chapter 26:	21, 22, 24, 26, 27, 35.

GENERAL ADVICE REGARDING PROBLEMS

It is assumed that the good student will be able to work all the problems in the textbook (even the study problems in each chapter) even though, only some have been suggested. You must work lots of problems, even from other textbooks and study guides to be sure you understand and can use the concepts studied. It is not a good idea to try to memorize solutions to problems, since identical problems will not be used again. You also should determine ways to check the answer to a problem you have solved by application of common sense. Also, ask yourself how a problem might be rearranged as a possible test item. You will find this helpful in preparing for exams.

Compare your answers with other students. Remember that there is typically more than one possible solution to a problem! Be precise with your answers. On your exams, you will be graded on what you write, not what you meant to write, or thought you wrote. If your explanations do not make sense to your classmate, then they probably will not make sense to the exam grader.

CLASS ATTENDANCE POLICY

All students are expected to attend class on a regular basis. The Department of Chemistry adheres to the attendance policy set by the University as stated in the most current

Undergraduate Catalog. Being late by more than 5 minutes is equivalent to missing a lecture or laboratory. You must be on time in order to take an exam. Excessive absence is defined as missing more than 10% of the lecture or laboratory sessions without excusable reasons. Excessive absence will be reported to the Dean of the College and the Dean of Students, in accordance to the TAMU-Commerce Procedure A13.02. Good class attendance will be necessary in order to pass the course. If you miss more than 3 lectures prior to the first exam, the instructor reserves the right to drop you from the course. If you miss more than 6 lectures throughout the course of the semester, the instructor reserves the right to drop you from the course.

STUDENT CONDUCT POLICY

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment (see Student's Guidebook, Policies and Procedures, Conduct). Any student engaging in disruptive behavior will be dismissed from class on the first offence. A second offence may constitute dismissal from the course with a failing grade.

CHEATING AND OTHER BREACHES OF ACADEMIC CONDUCT

Academic cheating, plagiarism, and other forms of academic misconduct may result in removal of the student from class with a failing grade or may in extreme cases result in suspension or expulsion from the University as described in the "Code of Student Conduct" section of the "Student's Guidebook."

STUDENTS WITH DISABILITIES

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services
Texas A&M University-Commerce
Gee Library
Room 132
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
StudentDisabilityServices@tamuc.edu

NONDISCRIMINATION STATEMENT

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.