

Course Code: CHEM 311 and CHEM 315
Course Title (credits): Organic Chemistry Lecture (3) and Lab (1)
Term and Year: Fall 2014
Course Ref. No. (CRN): CHEM311: 80029
CHEM315: 80024

Instructor: Sean Ryland
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Lecture Meeting Time: TTh 8:30-9:45 AM
Lab Meeting Time: T 1:00-3:45 PM
Location: TCES202

Prerequisites: CHEM 102
Corequisites: CHEM 311 and CHEM 315

Course Description:

CHEM 311: An introduction to the chemistry of carbon compounds. Topics include organic nomenclature, structure, stereochemistry, and optical activity with specific focus on alkanes, alkenes, alcohols, and alkyl halides. Organic reaction mechanisms are used as a unifying theme in these studies.

CHEM 315: Complements CHEM 311 with an introduction to the laboratory techniques of organic chemistry, including extraction, distillation, recrystallization, and chromatography, with experimental exercises in the synthesis and isolation of organic compounds. Also includes an introduction to instrumental analysis.

Student Outcomes:

Students successfully completing these courses will demonstrate the following:

- Understanding of fundamental organic chemistry concepts sufficient to explain the concepts to other scientifically minded individuals.
- Problem solving skills sufficient for predicting organic chemistry reactions and mechanisms.
- Ability to successfully answer questions regarding organic chemistry nomenclature, reaction mechanisms and molecular properties in formats similar to common standardized tests such as the MCAT and GRE.
- Competence in basic organic chemistry lab techniques and safety, including the ability to write and follow a laboratory procedure using standard operating procedures.
- Competence in maintaining laboratory notebooks and ability to write laboratory reports.

Methods for Assessing Student Outcomes:

Weekly homework assignments, three hour exams and a comprehensive final exam will be used to assess student knowledge and competence. Written laboratory reports will be assigned to evaluate student mastery of laboratory techniques and concepts.

Learning Strategies:

Organic Chemistry I and Lab will use texts oriented to understanding concepts and problem solving, lectures, assigned homework problems for each chapter, class problem solving sessions. In laboratory exercises, students must prepare a laboratory plan, keep a notebook of laboratory results, and compile a laboratory report to communicate a body of knowledge, concepts, and skills related to organic chemistry and scientific research. Student study groups outside of class time are highly encouraged.

Instructional Texts:

CHEM 311:

1. Paula Y. Bruice, Organic Chemistry 6th ed. (Pearson, ISBN 10: 0321727010).
2. Molecular Model Set for Organic Chemistry
3. Optional: P.Y. Bruice, Organic Chemistry Study Guide and Solutions Manual 6th ed. (Pearson, ISBN 10: 0321676823).

CHEM 315:

1. John W. Lehman. Microscale Operational Organic Chemistry. (Prentice Hall, ISBN 10: 0130335185)

Attendance:

Attendance will not be graded. HOWEVER, any higher education course demands a substantial time commitment, organic chemistry more than most. Missing a lecture will result in forfeiture of credit for any in-class work. Laboratory reports will only be accepted from students who have completed the lab exercise. Laboratory exercises can be made up at the discretion of the instructor. Acceptable excuses include, but are not limited to, illness (of the student or a dependent) with a physician's note, military duty or family bereavement. Oversleeping or conflicting employment schedules are NOT acceptable excuses.

Sanctions for Academic Dishonesty:

For a comprehensive definition of what is considered cheating or plagiarism, please refer to the Sierra Nevada College Course Catalog. In short, academic dishonesty is representing another's work or thoughts as your own or fabricating results. For the first offense, the student receives a zero for assignment/exam and/or a determination by the faculty if the student should fail the course is made. Counseling with faculty on the honor code, consequences for violating the honor code, and the value of academic honesty in learning are provided. In the event of a second offense, the student will be expelled.

Special Accommodations (ADA) Statement:

"In accordance with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, students with a documented disability are eligible for support services and accommodations. If a student wishes to request an accommodation, contact the Director of Student Services (Prim Library room 323) at (775) 831-7799 x7534 within the first week of the semester."

Grading Policy:

Independent letter grades will be awarded in CHEM 311 and CHEM 315 according to standard grading conventions as follows. A: >90%, B: 80-90%, C: 70-80%, D: 60-70%, F: <60%. Plus and minus grades will be awarded accordingly. Grades will be determined as follows:

Homework:	15%
Exams:	30%
Laboratory Reports:	20%
Final Exam:	25%
Laboratory Final:	10%

Homework: Homework will be assigned and collected weekly. Through the appendices at the end of the text and the solutions manual, answers for every homework question are available. PLEASE use these resources as a means of evaluating your own understanding. DO NOT copy answers blindly from these sources; if you do so, not only is it obvious to the instructor, you are undermining your own success in the class.

Exams: Exams will be given with at least two weeks notice, but it is recommended that students study and complete homework assignments at all times. Make up exams may be given at the instructor's discretion, but only in the most extreme cases, and they must be taken before the exam is given to the rest of the class.

Final Exam: the Final Exam will be comprehensive. The format will be similar to the previous exams and will be administered during Finals Week as scheduled by SNC.

Lab Reports: The format of Lab Reports will be discussed during the first lab session. Students will be allowed to drop the scores of two lab reports from their final grade in order to account for absences and unforeseen circumstances. Please, DO NOT skip lab exercises just because you can; you might end up needing to skip lab for unforeseen circumstances later in the semester.

Laboratory Final: The Lab Final will consist of a group presentation of an article from the primary literature. More details will be provided as the semester progresses.

Due Dates and Late Work: Assignments (Homework, Lab Reports and Exam Adjustments) are due at the beginning of class the day they are due. Once class has started, assignments are docked 10% of the total points possible. Every day following, the assignments lose an additional 10% to a minimum of 50%

Advice from a Former Student: Be present and awake in class and lab. I know it's not possible to pay attention every minute of every lecture, but I will provide plenty of opportunities for students to discuss material during class, which should help you absorb the material and stay awake. Try not to fall behind, as that will impact your ability to comprehend the new material being presented. Do not be afraid to ask me or others for help with difficult concepts, but put a significant amount of time into the problem before you come to office hours if you want to get anything out of it.

Acknowledgements:

Thanks to Dr. Tom Clarke for the use of his syllabi in crafting this syllabus.

Tentative Schedule:

Week	Date	Reading	Topics and Assignments	Lab Assignments
1	8/19	Chapter 1	Chemical Bonding Review	Handout: Measurements, Percent Yield, and Glassware
	8/21	Chapter 2	Functional Groups and Nomenclature	
2	8/26	Chapter 2	Properties of Organic Compounds	Lab 2: Solubility
	8/28	Chapter 3	Introduction to Alkenes	
3	9/2	Chapter 3	Introduction to Reactions	Lab 3A: Crystallization (Semimicroscale)
	9/4	Chapter 4	<u>Mechanism 1</u> : Electrophilic Addition	
4	9/9	Chapter 4	Alkene Reactions	Lab 8: IR, NMR and Boiling Point Analysis
	9/11	Chapter 5	Stereochemistry	
5	9/16	Chapter 5	Enantiomers	Lab 10: Isolation of Ibuprofen
	9/18	Chapter 6	Alkynes	
6	9/23	N/A	Review for Exam #1	Lab 16: (+) and (-) Carvones
	9/25	N/A	Exam #1: Ch 1-6	
7	9/30	Chapter 7	Delocalized Electrons	Handout: Synthesis of Salicylic Acid
	10/2	Chapter 7	Resonance	
8	10/7	Chapter 8	<u>Mechanism 2</u> : S _N 2 Reactions	Lab 9: Synthesis of Aspirin
	10/9	Chapter 8	<u>Mechanism 3</u> : S _N 1 Reactions	
9	10/14	Chapter 9	<u>Mechanisms 4 and 5</u> : Elimination (E1 and E2)	Lab 15B: Clove Oil Extraction (Semimicroscale)
	10/16	Chapter 10	Reactions of Alcohols, Ethers, etc.	
10	10/21	N/A	Practice with Reactions	Handout: Clove Oil Purification and Analysis
	10/23	N/A	Synthesis	

Week	Date	Reading	Topics and Assignments	Lab Assignments
11	10/28	N/A	Review for Exam #2	Lab 14A: Isopentyl Acetate Synthesis (Microscale)
	10/30	N/A	Exam #2: Ch 7-10	
12	11/4	Chapter 11	Organometallic Reactions	Presentation Assignment
	11/6	Chapter 12	<u>Mechanism 6</u> : Free Radical Reactions	
13	11/11	N/A	Veterans Day (No Class)	N/A
	11/13	Chapter 12	Free Radical Reactions	
14	11/18	Chapter 24	Catalysis	Presentations: Lab Final
	11/20	TBD	Contingency Day	
	11/25	N/A	Thanksgiving Break	N/A
	11/27	N/A		
15	12/2	N/A	Exam #3 Review	Final Exam Review
	12/4	N/A	Exam #3: Ch 11, 12, 24	
Final	TBD	N/A	Final Exam Ch: 1-12, 24	N/A