CHEM 232 – Organic Chemistry II Lecture
Fall 2015, CRN 10280, Section 01
Monday, Wednesday, and Friday, 11:00 – 11:50 PM, RSS 103

Instructor: Prof. Brooke A. Van Horn
E-mail: vanhornba@cofc.edu (best way to reach me if not in my office)
Office: School of Science and Math Building (SSMB) 104

Instructor Schedule: I want you to ask questions so that you can be successful in this course! However, if my door is closed and/or if I post that I am currently busy on my door, please respect this need for dedicated time and come back later, attend scheduled office hours, or send an e-mail to have your concerns addressed.

Office Hours (in SSMB 104): T - 10-11:30 AM; W - 1-2 PM; F - 1-2 PM; other times by appoint. only!
Weekly Help Session (led by BVH): Tuesday evenings, 7-8 PM in SSMB 100


OAKS: Course materials, including the syllabus, any extra problem sets, study guides, handouts, etc. will be made available through the OAKS system accessed via MyCharleston.

Co-Requisite and Drop Policy: CHEM 232L Laboratory is a pre- or co-requisite of this lecture course. If you drop either course, then you must also drop the other. The last day to withdraw from the course with a grade of “W” will be Thursday, October 29th, 2015.

Course Technical Objectives: This second semester course is part of a two-semester sequence and is taught to introduce the structure, properties, and reactivity of the class of chemical compounds encompassed by the descriptor “organic.” Included in this classification are biomolecules, many synthetic drug molecules, plastics/polymers, and industrial solvents, among many others. The knowledge of the basic concepts and learned study skills from the first semester course, CHEM 231/HONS 192, are the foundation from which you will build upon in this second semester course, CHEM 232, and will prepare you for success in advanced chemistry, biochemistry, and chemical/molecular biology courses when approached with similar diligence. Please see the “Essential Learning Objectives” at the end of this document for more specific details.

IMPORTANT: This course moves very quickly and the material presented/learned last week is the foundation for the material being covered this week. Be prepared to study every week (> 10 h for the average student – approximately 4 h for every hour of lecture to complete reading, lecture review, and assigned problems) and come to review sessions and office hours with your questions.

As a student in CHEM 232, the burden of the learning is on you; as the instructor, I am here to present and explain the course material to the best of my ability and to help you master the material by providing examples and problem sets to practice applying the concepts.

We will be covering the following textbook chapters and course material topics in CHEM 232 over our in-class lectures (50 minutes each):

Chapter 14 – NMR
Chapter 16 – Conjugation, Resonance, and Dienes
Chapter 17 – Benzene and Aromatic Compounds
Chapter 18 – Reactions on Aromatic Compounds
Chapter 19 – Carboxylic Acids and the Acidity of the O-H Bond
Chapter 20 – Introduction to Carbonyl Chemistry; Organometallic Reagents; Oxidation and Reduction
Chapter 21 – Aldehydes and Ketones – Nucleophilic Addition
Chapter 22 – Carboxylic Acids and Their Derivatives – Nucleophilic Acyl Substitution
Chapter 23 – Substitution Reactions of Carbonyl Compounds at the alpha Carbon
Chapter 24 – Carbonyl Condensation Reactions
Chapter 25 – Amines
Chapter 26 – Carbon-Carbon Bond-forming Reactions in Organic Chemistry

***ADDITIONALLY: Chapters 13 on IR, MS will be further used in CHEM 232L and in lecture***

Attendance Policy: Attendance in lecture is REQUIRED. The grade of "WA" due to excessive absences WILL NOT be used in this course as it is unnecessary. It is very difficult to be successful in organic chemistry without attending the lectures, where you will be practicing the art of thinking in, translating, and writing/drawing organic chemistry. You are responsible for learning a substantial amount of required material for this course (most of which will be covered both in lecture and in the textbook, but some of which may be in lecture only or in the textbook only.)

This being said, there are NO excused absences. If you do miss class, it is your responsibility to recover the required material, possibly from classmates. Additionally, please arrive to class on time. Late arrivals to quizzes, tests or the final exam will not be given extra time and the instructions will not be repeated. Any work/points missed (including exams, regardless of reason) will be given a grade of zero (0) for the final grade.

Grading Policy: Earning the minimum percentage to achieve an A necessitates strong study skills and diligence in working the suggested practice problems which will prepare you to perform well on the evaluation tools in the course including: (a) four in-class exams, (b) quizzes, (c) one ACS standardized final exam, and (d) the assigned ConnectPlus LearnSmart modules.

Two methods to determine the final grade percentage will be considered (as follows) with the final grade being assigned from the one giving the higher score.

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<th>Method</th>
<th>Description</th>
<th>Overall Grade</th>
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<tr>
<td>I</td>
<td>Four (4) Exams: each 15% of overall grade</td>
<td>60%</td>
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<td>One (1) Final Exam: 20% of overall grade</td>
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<td>Quizzes (cannot be dropped): 15% of overall grade</td>
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<td>ConnectPlus – LearnSmart: 5% of overall grade</td>
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<th>Method II: Beneficial for a missed or poor exam</th>
<th>Description</th>
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<tr>
<td>Three (3) Exams – highest: each 15% of overall grade</td>
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<tr>
<td>One (1) Final Exam: 35% of overall grade</td>
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<tr>
<td>Quizzes (cannot be dropped): 15% of overall grade</td>
<td>15%</td>
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</tr>
<tr>
<td>ConnectPlus – LearnSmart: 5% of overall grade</td>
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Additionally, any concerns or questions regarding the correctness of grades or individual graded work are to be addressed OUTSIDE of class and by appointment, not in common office hours for privacy reasons. Any requests for the addition of points back onto graded work will require (1) the original graded work, with NO additional marks after returned to the student, and (2) a formal typed document describing in detail where the mistake in grading was made and why (in chemical terms) the graded work demonstrates the correct answer. Lastly, requests to regrade work will only be considered if the above guidelines are followed and if the potential benefit of the regrade would result in at least 1 pt on a quiz (usually worth 10 points) or at least 2 points on an exam (usually worth 100 points.)
Exams: Four in-class exams will be used to evaluate your level of understanding of the material presented in lecture, the readings in the text, and the practice problems assigned. The exact exam format will vary from test to test, but will contain multiple choice questions, short answer/ranking problems, drawing of mechanisms, and at least one larger "bring-it-all-together" free response problem. The exams will be given on the following dates:

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<td>Friday, Sept. 18th</td>
<td>Friday, October 16th</td>
<td>Friday, November 13th</td>
<td>Friday, December 4th</td>
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Quizzes: These point-earning opportunities will be presented on FRIDAYS (~ 9 times in the semester) to allow you to demonstrate how well you are keeping up with the day-to-day course material. Each quiz will be worth a minimum of 10 points (sometimes with potential bonus points above 10). The total points accumulated will be used to calculate a percentage and weighted as 15% of your total grade.

Final Exam: The final exam will be an ACS-standardized multiple-choice final given on December 11th at 12:00 - 3:00 PM (see the College of Charleston academic calendar; location - lecture room RSS 103).

Grading Scale: The grading scale below reflects the grade percentages necessary to achieve each letter grade:

- 100-93 A
- 92-90 A-
- 89-87 B+
- 86-83 B
- 82-80 B-
- 79-77 C+
- 76-73 C
- 72-70 C-
- 69-67 D+
- 66-63 D
- 62-60 D-
- <60 F

Final grades will be posted online through MyCharleston as FERPA (The Family Educational Rights and Privacy Act) restricts instructor ability to give these grades by posting, e-mailing, or over the phone.

ConnectPlus – LearnSmart: This product associated with the course textbook publisher is an online tool to be graded on COMPLETION of the modules available for each chapter, not correctness of all of your answers. Each module is assigned through the ConnectPlus LearnSmart interface and due at the times/dates listed online. The overall grade for this portion of the course will be the average percentage scored over all of the 12 chapter modules assigned and will be weighted 5% of the total course grade.

Honor Code Policy: Students are expected to be aware of and conform to the standards of the College of Charleston Student Honor Code Policy (linked from http://studentaffairs.cofc.edu/honor-system/index.php). In addition, students in this course are also expected to be conscious of and conform to the standards provided by the Department of Chemistry and Biochemistry Policy on Scientific Integrity (link on the Department main page and provided in laboratory class).

Electronic Device Policy: One aspect of being a member of a community of scholars is to show respect for others by the way you behave and do your part to create or maintain an environment that is conducive to learning. Allowing your cell phone to ring or texting/messaging in class are examples of inappropriate behavior because it distracts your classmates and thus degrades their overall classroom experience. For the sake of your classmates, you are expected to turn off your cell phone or set it to mute/silence BEFORE you enter class — every class. I reserve the right to ask you to leave if I believe your attention or the classroom environment is compromised through electronic device use.
Essential Learning Objectives for CHEM 231 and CHEM 231L:  
First Semester of Introductory Organic Chemistry Lecture and Laboratory

The successful student is expected to (Lecture):
• Interpret and analyze structural formula and resonance characteristics of common functional groups
• Draw and interpret general features of curved arrow notations that illustrate mechanistic processes for common organic reactions
• Use IUPAC and common nomenclature for alkanes, alkenes, alkynes, alkyl halides and alcohols
• Draw and interpret three dimensional structures for all types of isomers of organic compounds
• Define and use fundamental concepts associated with acid-base, thermodynamic, kinetic and structural theories as they relate to processes associated with organic chemistry
• Evaluate knowledge and principles about organic reactions and reactivities to make reasonable predictions about likely outcomes when presented with related chemistry
• Deduce, design and evaluate retrosynthetic schemes including functional group transformations

The successful student is expected to (Laboratory):
• Find, apply and assess MSDS to identify health and fire hazards of chemicals
• Make an accurate experimental record and succinctly summarize experimental findings
• Perform measurements and characterize organic compounds by use of MP, GC and IR analysis
• Deduce molecular formula of an organic compound from mass spectrometry data
• Apply the processes used in organic chemistry that might include combinations of simple distillation, fractional distillation, recrystallization, extraction, neutralization, chemical tests and thin layer chromatographic analysis
• Perform a simple chemical reaction, isolate the product, and then determine the percent yield and purity of the product

Essential Learning Objectives for CHEM 232:  
Second Semester of Introductory Organic Chemistry

The successful student is expected to:
• Use IUPAC and common nomenclature for ethers, aromatics, carbonyl containing compounds, and amines
• Analyze and interpret $^{13}$C-NMR and $^1$H-NMR spectra
• Draw and interpret mechanisms for complex reactions that might include some or all of the following: electrophilic and nucleophilic aromatic substitution, acyl nucleophilic substitution, Diels-Alder cycloaddition, nucleophilic addition to aldehyde or ketone, enol and enolate chemistries, nucleophilic aromatic substitution, and rearrangement reactions
• Integrate knowledge and principles of organic reactions and reactivities to make reasonable predictions about likely outcomes when presented with related chemistry
• Develop and evaluate multistep retrosynthetic schemes including methods to modify the carbon backbone of a molecule