Chemistry 261 Course Syllabus

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Course Description (from Westminster Undergraduate Catalog):
An overview of organic chemistry. Organic molecules are compared by their functional groups, focusing on nomenclature, physical properties and the major chemical reactions used in synthesis and identification. Emphasis is also given to the areas of acidity, basicity, stereochemistry, aromaticity and spectroscopy. Laboratory activities involve techniques for determination of physical and chemical properties, and methods of purification.

Required Textbook
- Daley and Daley, free pdf e-text posted on D2L

Required Online Homework
- OpenOChem: Free homework systems operated through D2L

Recommended: Darling Model Kit: Buy Here (www.darlingmodels.com) for $25.00, including shipping

Course Philosophy
CHE 261 explores organic structure and reactivity, providing students with the necessary foundation to understand much of the known compendium of organic chemical reactions. Emphasis is placed on core concepts of structure, stability, locations of reactivity and electron movement during reactions. These core concepts will be revisited time and time again in the contexts of specific basic organic chemical reactions.

The aim in this course is to encourage and allow students to master material. Grades are not given in this course, they are earned through mastery of material and demonstration of skills. All homework, assessments and lab assignments in this course are graded pass/fail, with evidence of mastery being necessary to earn a passing grade. Mastery doesn't always come on the first attempt! Multiple attempts are available to allow you time to develop skills and achieve mastery.

Student Outcomes—Chemistry

1. To acquire appropriate discipline specific knowledge spanning the areas of Analytical, Biochemistry, Inorganic, Organic, Physical chemistry as well as appropriate supporting courses
2. To develop skills in modern laboratory methods, instrumentation, and data analysis.
3. To develop skills in appropriate research techniques including experimental design and scientific literacy.
4. To critically evaluate and solve relevant problems by applying the knowledge and skills of chemistry and/or biochemistry.
5. To effectively communicate the concepts of chemistry and/or biochemistry using accepted professional standards and language.
6. To demonstrate scientific responsibility, stewardship, and professional ethics as outlined by the American Chemical Society - Chemists Code of Conduct.
Student Outcomes—Chemistry 261

Upon successful completion of Chemistry 261, a student will:

- Understand how the fundamental properties of atoms, such as electronegativity, affect their reactivity
- Speak the basic vernacular of chemistry including the ability to name novel molecules
- Visualize structures in three dimensional space and how their conformation affects reactions
- Predict the reactivity modes and transformations of several simple organic functional groups
- Understand acidity, basicity, geometry and polarity of organic molecules.
- Predict the outcome of simple reactions based on compound functionality.
- Make connections between material to answer complex and multi-step problems
- Demonstrate an understanding of spectroscopy and utilize data to determine structures of organic compounds.

CHE 261 Lab

The lab component of CHE 261 is an important part of the class. Several of the course outcomes require hands-on experience in a laboratory, and the reality is that many people come to a better understanding of scientific concepts when they experience them first-hand for themselves. This lab is also complementary to the course, teaching skills and topics not explicitly presented in the course.

The key learning objectives for the lab portion of the class are:

- Demonstrate an understanding of laboratory techniques and methods of analysis.
- Use evidence to support claims.
- Communicate chemical experiments effectively and in an appropriate scientific format.
- Demonstrate understanding of and follow basic safety guidelines in the laboratory

For each laboratory experiment, there will be an initial quiz to check understanding of the laboratory procedure and the safety considerations for that experiment. Results on these quizzes will cumulatively serve as an additional lab grade.

During lab, the instructor and TAs will conduct STOPs (Spot Tests on Procedure). These checks will be made to help you process how these procedures work rather than following a set of directions blindly. Be prepared to explain why each step of the lab you are doing is important!

Course Requirements and Grading

This course is organized by Learning Objectives (see CHE 261 Learning Objectives handout). There are seven Essential Learning Objectives (ELOs) and 15 General Learning Objective (GLOs). For each Learning Objective there is a reading assignment and an online homework assignment. The ELOs are considered the core, vital material of the course. Without mastery of the ELOs, you cannot pass the course.

All grading in the course is pass/fail. Grades are not given, they are earned by demonstrating mastery. Mastery is not always achieved in one try, therefore multiple attempts will be provided.
**Course Component Weights**
Laboratory Assignments = 25%
Homework = 15%
Learning Objective Assessments = 60%

**Learning Objective Assessments:** Each of the 21 Learning Objectives will be assessed with multiple opportunities. The assessments will consist of a 1-2 page activity with questions in a free answer format. Many (but not all) problems will be similar (but not identical) to problems encountered in classroom activities, laboratory projects, online homework assignments, and assigned reading. Deep conceptual knowledge and ability to apply that knowledge will be emphasized. Although each assessment will focus on one Learning Objective, learning subsequent material requires building up from a knowledge base of previous material. In other words, material from the beginning of the course can show up on later assessments.

Students will choose 2-3 assessments to attempt each Assessment Day. You must inform the instructor two days prior to Assessment Day which assessments you wish to attempt. You may also attempt assessments during periods in lab in which you have “down time” or by appointment, with at least 24 hour advance notice.

Learning Objective Assessments are graded PASS/FAIL. The threshold for passing is 80-90% depending on the assessment. Multiple and unlimited attempts will be allowed. If an assessment is failed twice, student will meet with the instructor prior to a third attempt. Your grade on assessments will depend on how many assessments are passed.

To receive an “A” you must pass all 7 Essential Learning Objectives and 11-14 Learning Objectives
“B” you must pass all 7 Essential Learning Objectives and 8-10 Learning Objectives
“C” you must pass all 7 Essential Learning Objectives and 5-7 Learning Objectives
“D” you must pass all 7 Essential Learning Objectives

**Homework:** Throughout the course, you will have assignments on OpenOChem or paper and pencil. These assignments will be correlated with the current course content and help you prepare for class time. It is strongly suggested that you turn in all assignments on the due date to prepare for class and for Learning Objective Assessments.

Homework assignments are graded PASS/FAIL. A passing grade is 90% mastery of the objective. Your grade on homework will depend on how many OpenOChem assignments are passed.

To receive an “A” you must pass 19 of 21 assignments
“B” you must pass 17 of 21 assignments
“C” you must pass 15 of 21 assignments
“D” you must pass 13 of 21 assignments

Use the homework system to your advantage! In this homework system, you can check your answers on a correct/incorrect basis. You may repeat the assignment to redo any problems you initially miss.

**Laboratory Grading:** See laboratory syllabus.

**Note on “F” Grade:** The numerical value earned for achieving less than the “D” level in any category depends on how many assignments, labs or assessments were passed. The numerical grade is scaled to
reflect this. The course cannot be passed without passing all 7 ELOs nor without passing the laboratory portion of the course.

**Reading your Chemistry Textbook:** Reading a science textbook is not like reading a novel. To read well, you must turn the reading into a targeted, active process. One way to do this is to assemble a preliminary list of questions to answer as you read the text. For example, you might find the words in bold and work to be able to define each of those at the end of the reading. Or you might set yourself a goal of being able to answer the end of section practice questions by the time you finish reading the section. The main point is that you are actively seeking specific information as you read.

**Course Policies**

**Attendance and Make-Up Policy:** Attendance to each lecture is expected but not mandatory. It is in your best interest to attend every lecture. If you miss lecture for any reason (other than illness, family emergency, or sanctioned college function) you are responsible for the material we covered in class. Requests to make up assessments missed for excused absences will be honored. The assessment will be a new version.

Make-up labs will be at the discretion of Lori Micsky. You will contact her to arrange these and her judgement is final.

**Lab Clothing:** You must wear sleeved shirts, and pants or skirts long enough to cover your knees, closed-toed shoes, and a pair of splash goggles. Without this attire, you will not be permitted to participate in lab!

**Accessibility Statement:** Westminster College actively strives for the full inclusion of all our students. Students with disabilities who require access solutions for environmental or curricular barriers should contact Faith Craig, Director of Disability Resources, located in 209 Thompson-Clark Hall. (email: craigfa@westminster.edu; phone: 724-946-7192)

**Academic Integrity:** Details of the Westminster College Academic Integrity Policy (AIP) can be found in the Westminster College Undergraduate Catalog. Violations of the AIP include cheating, misconduct, plagiarism, and providing false information (including experimental results). Academic dishonesty will not be tolerated. The first citation of academic dishonesty will result in a grade of zero for the specific assignment. The second citation will result in a failing grade for the course. All citations of academic dishonesty will be reported to the Dean of the College, in accordance with college policy.

In this course you will often work in pairs and groups and sometimes with the same data. We will share *approaches* to problems, but unless explicitly instructed otherwise, the work you turn in must be your own: state ideas in your own words, and complete mathematical work independently. With the exception of raw data, do not share electronic files (e.g. documents or spreadsheets) of course-work with your classmates. If in doubt, check with your instructor BEFORE sharing work.

**Student Expectations:**
- Read and consider the assigned material prior to class.
- Bring a notebook, the necessary handouts, a pencil, and a calculator to every class meeting.
- Participate in classroom discussion and team assignments.
- Complete all assignments on time.
- Write down your questions and bring them to class, or send your instructor an e-mail message.

It is expected that students spend a minimum of 2 hours outside of class for every hour spent in class!

**Additional Help:** Chemistry 261 proceeds at a very rapid pace. Keep up with the material! Do ALL suggested problems! For additional help, come see me (stop by my office or make an appointment), attend help sessions, and/or contact the Academic Success Center (x6700)