Course Description (from Westminster Undergraduate Catalog):
A course emphasizing stoichiometry, chemical equilibria, acids and bases, chemical kinetics, thermodynamics, electrochemistry, nuclear phenomena, and interactions of science and society. In the laboratory program students will investigate chemical systems, analyze observations, devise explanations, and communicate results.

Required Materials:
- CHE 117 Course Packet
- calculator
- safety glasses

Required Textbook and Online Learning System
Free online viewing and pdf download, $65 for hard copy

Required Online Homework
OWLv2: You should already have an account and be working on have finished the initial assignment.

Course Philosophy
CHE 117 covers material that is beyond a high school level. In order to accomplish this, it assumed you have a working knowledge of chemistry fundamentals including, but not limited to, element names and symbols, common cations and anions, chemical formulas, writing and balancing chemical equations, unit conversions, and gas laws.

In addition to the conceptual material covered in class, this course emphasizes the student’s ability to think critically, communicate effectively, and work in a team-oriented atmosphere. Lecture and laboratory components are integrated.

Student Outcomes
- Demonstrate an understanding of chemical principles by applying them in interpreting data and solving problems.
- Demonstrate an understanding of the chemical nature of the natural world.
- Demonstrate an understanding of the interactions between science and society.
- Demonstrate awareness of some of the ethical issues in science and their implications in the present and the future.
CHE 117 Lab

The lab component of CHE 117 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.

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

- Demonstrate an understanding of chemical principles by applying them to interpret data and solve problems.
- Use evidence to support conclusions
- Communicate chemical experiments effectively and in an appropriate scientific format.
- Demonstrate understanding of and follow basic safety guidelines in the laboratory

Laboratory: The “block schedule” format for this course allows flexibility as to the length of laboratory experiments. Many days, there will be 1 hour of classroom work followed by 1 hour of laboratory work. Some days may require 2 full hours of lab work and other days will have no lab work. The experimental work done a day that you were absent may only be made up at the discretion of Lori Micsky.

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

Course Component Weights
Laboratory Assignments = 25%
Homework = 15%
Learning Objective Assessments = 60%

Grading Scale

<table>
<thead>
<tr>
<th>Grade</th>
<th>Numerical Range</th>
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<tbody>
<tr>
<td>A</td>
<td>3.8-4.3</td>
</tr>
<tr>
<td>A-</td>
<td>3.5-3.8</td>
</tr>
<tr>
<td>B+</td>
<td>3.2-3.5</td>
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<tr>
<td>B</td>
<td>2.8-3.2</td>
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<tr>
<td>B-</td>
<td>2.5-2.8</td>
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<tr>
<td>C</td>
<td>1.8-2.2</td>
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<td>C-</td>
<td>1.5-1.8</td>
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<td>D+</td>
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<tr>
<td>D</td>
<td>0.8-1.2</td>
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<tr>
<td>D-</td>
<td>0.5-0.8</td>
</tr>
<tr>
<td>F</td>
<td>0-0.5</td>
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</tbody>
</table>

We will be using pass/fail homework, laboratory assignments and Learning Objective Assessments for this course. On a numerical scale in each category:

A+ = 4.3
A = 4.0  
B = 3.0  
C = 2.0  
D = 1.0  
F = 0-1.0, depending on how much completed

**Learning Objective Assessments:** Each of the 21 Learning Objectives will be assessed with multiple opportunities. The assessments will consist of a mixture of conceptual problems and mathematical problems which require a calculator. 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 per week to attempt each Friday. You must inform the instructor by Wednesday which assessments you wish to attempt.

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. Extra attempts may require out-of-class appointments. If an assessment is failed twice, student will meet with me 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

**NOTE:** You cannot pass the course without passing all 7 Essential Learning Objectives

**Homework:** Throughout the course, you will have assignments on OWLv2. 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.

OWLv2 assignments are graded PASS/FAIL. A passing grade is 90% mastery of the objective. Your grade on homework will depend on how many OWLv2 assignments on which you earn a passing grade.

To receive an ”A” you must pass 18 of 20 OWLv2 assignments  
“B” you must pass 16 of 20 OWLv2 assignments  
“C” you must pass 14 of 20 OWLv2 assignments  
“D” you must pass 12 of 20 OWLv2 assignments

Use the OWLv2 homework system to your advantage! In addition to the assignments, OWLv2 contains Adaptive Study Plans to help you assess your knowledge and skills in different areas and work on areas of weakness. You can take a quiz to assess your knowledge, and then work through study materials provided to strengthen your skills.
Lab Grading

The four objectives listed above will each be directly evaluated.

1. Demonstrating an understanding of chemical principles by applying them to interpret data and solve problems.
   a. Evaluated for each lab based on outcome of lab, informal lab write-up or formal lab report (all labs, 12 total opportunities)
   b. Pass quizzes with at least an 80% score (collectively one opportunity)
   c. STOPs (collectively one opportunity)

2. Using evidence to support conclusions
   a. Evaluated for each lab that provides an opportunity to state and conclusion and support it with evidence (Lab 1, Lab 3, Lab 4, Lab 5, Lab 6, Lab 7, Lab 8, Lab 9, Lab 10, Lab 11, Lab Project)

3. Communicate results and conclusions effectively
   a. Formal lab reports evaluated for elements of communication—separate from learning objective number 1 (Lab 3, Lab 5, Lab 8, Lab 9, Lab Project)

4. Demonstrate understanding of and follow basic safety guidelines in the laboratory (all labs collectively)
   a. Demonstrate safe behaviors in lab, including the use of personal protective gear and proper safety precautions
   b. Properly dispose of all chemical waste

Grading Guidelines:
A: 11 of 14 opportunities passing objective 1, 5x passing objective 2, 3x passing objective 3, pass objective 4
B: 9 of 14 opportunities passing objective 1, 4x passing objective 2, 2x passing objective 3, pass objective 4
C: 7 of 14 opportunities passing objective 1, 3x passing objective 2, 1x passing objective 3, pass objective 4
D: 5 of 14 opportunities passing objective 1, 2x passing objective 2, pass objective 4
F: not earning “D” criteria, grade based on how much of the “D” criteria were passed

NOTE: You cannot pass CHE 117 without passing the laboratory portion of the course

Lab assignments may be resubmitted for a second time during the semester. Resubmissions must be submitted within one week of the return of the graded lab. No resubmissions will be possible in cases of academic integrity violations, such as plagiarism.

Note on “F” Grade: The course cannot be passed without a minimum of a D grade in both the lab and assessment categories. A grade lower than “D” on the homework will be scaled between 0 and 1.0 depending on how many homework assignments are passed.

Laboratory Project: During the semester we will conduct a larger scale laboratory project. For this project, you will get a chance to think like a scientist. You will be asked to determine the identity of a compound by planning and carrying out experiments and evaluating data. While there will be materials and guidance provided, you will ultimately be doing the process of scientific investigation yourself. Further details, dates and information will be provided during the semester.

The laboratory project will count as two regular laboratory assignments.

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!

**Calculator Policy:** You must bring a scientific calculator with you for every class period. You may not use a cell phone or any other electronic device that has a function other than a calculator.

**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 your course packet, 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 117 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 Learning Center (x6700)