

Western State College  
Professor: Dale L. Orth

Office: Hurst 128A Extension 3437; email dorth@western.edu

Lecture/Discussion: Hurst 232 MWF 11:00-11:50 (CRN 23755)

Office Hours: Monday, Wednesday, Friday 2:00-2:50; Tuesday, Thursday 11:00-11:50;  
by appointment, or anytime you can find me

Website: <http://www.western.edu/faculty/dorth>

**Catalog Course Description:** A comprehensive course designed for students whose academic plans require advanced work in chemistry, such as Chemistry majors and minors, pre-med students, etc. Prerequisite or corequisite: MATH 140 or Accuplacer College-Level Mathematics test with a score of 75 or above, ACT math score of 24 or above, or instructor permission.

**Required Text:** *Chemistry A Molecular Approach, 2<sup>nd</sup> ed.*, by Nivaldo J Tro

**Other requirements:** Scientific calculator. Any scientific calculator will work, but if you need to purchase one, I recommend the TI 30-Xa which costs around \$12. You are required to bring this calculator with you to every class.

**Course Objectives:**

- to develop critical thinking skills necessary to making informed decisions in today's society
- to achieve a basic understanding of the science of chemistry (its language, methods, and limitations)
- to recognize the importance of chemistry in our world
- to address the goals of all Area II Natural Science General Education courses

**Grading:** Your total grade is partitioned as follows,

In class Quizzes & Work	16%
Blackboard online Homework	16%
Writing exercise	8%
4 Exams	48%
Final Exam	12%

with letter grades assigned on the following scale:

92.0% and above	A	72.0-77.9%	C
90.0-91.9%	A-	70.0-71.9%	C-
88.0-89.9%	B+	68.0-69.9%	D+
82.0-87.9%	B	62.0-67.9%	D
80.0-81.9%	B-	60.0-61.9%	D-
78.0-79.9%	C+	59.9% and below	F

I reserve the right to lower the grading scale, but will not raise it.

**In class Quizzes and Work:** For each chapter, I will suggest several problems. There will be frequent (approximately twice per week) very short (typically one question) quizzes on current material. On days that there are not quizzes at the beginning of class there will be a written response question at the end of class. These are to encourage you both to come to class (they CANNOT be made up), to pay attention, and to work the suggested problems as we cover the chapter. I will drop your lowest three quizzes/written responses when calculating your score for the course.

**Homework:** There will be online homework due approximately once per week. This will be administered through the online Blackboard system, which will be discussed in class. The questions in the homework sets are randomized, so you may work the homework as many times as you desire. Only your highest score will be counted for your grade, so you should be able to earn 100% of this portion of your grade, if you put in enough time to get them all correct. Obviously, this practice will also help you do well on exams. The homework is inaccessible after the due date, but the program will have “copies of the homework for test review” available after each homework set is due.

The website for Blackboard is <http://mycourses.western.edu>. You log on with the same username and password you use for the Western network (and WOL).

**Writing Exercise:** You will be assigned a paper responding to a particular issue of *Chemical & Engineering News*. The assignment will be described before your second exam, and will be due on November 4. Papers one class period late will receive half of the earned credit, and papers later than that will receive no credit.

**Exams:** There will be four exams during the semester as well as a final exam. Exams will typically cover the material from two chapters, though the first exam will cover material from chapters 1-3. The exams are tentatively scheduled for **Friday, September 16; Wednesday, October 12; Friday, November 11; and Friday, December 9**. The exams will be based on class lecture, discussions, suggested problems, and the text.

**Final Examination:** The final examination will be cumulative. It is scheduled on Monday, December 12 from 3:30-5:30.

You should make your travel plans accordingly. Absence at the final examination will result in a score of zero.

**Withdrawal policy:**

The deadline to withdraw from the course is November 3. The deadline to drop is September 7. If you drop or withdraw from CHEM 111, you must also drop or withdraw from CHEM 112. Dropping or withdrawing from this class is your responsibility. Do not expect that I will do it for you.

**Attendance Policy:**

Attendance and participation are expected. Quizzes and in-class work will not be able to be made up. Please see me ahead of time about any planned absences. Failure to show up for any activity (including exams) will usually result in a zero for that activity.

**Course Outline:**

We will discuss the material of the first eleven chapters of the text, except we will skip chapter 6. We begin by discussing how science is done in chapter 1. Chapter 2 looks at atoms, the constituents of matter as far as chemists are concerned. Chapter 3 looks at combinations of atoms (compounds). We will learn different ways they combine, their properties, and how to name them and describe their changes using chemical equations..

Chapter 4 looks carefully at the relationships between the amounts of reactants and products in chemical reactions. It also looks at reactions in solutions. We will delay chapter 5 until the end of the semester and skip chapter 6.

Chapters 7 and 8 look at the development of the periodic table and the quantum theory that supports it, including electron configurations for atoms and the many trends that follow them.

Chapters 9 and 10 look closely at covalent bonding (when atoms share electrons to form compounds.) We will study Lewis structures as well as the quantum mechanical molecular orbital theory and valence bond theory. We will also examine molecular shape and its relationship to important molecular properties. Chapter 5 focuses on the special case of gases where intermolecular forces are weak and can often be neglected. Intermolecular forces are the subject of chapter 11.

**Academic Integrity:**

The academic community is operated on the basis of honesty, integrity, and fair play. Occasionally, this trust is violated when cheating occurs, either inadvertently or deliberately. You should review the portion of the college catalog on academic integrity. It can be found on pages 38-39 of your personal print copy or it is also available at <http://www.western.edu/academics/registration-services/pdf/catalog/2011.pdf> “Violations of academic integrity may result in the following: an F grade or a zero for the assignment, an F for the course, withdrawal from the course, or suspension or expulsion from the college. Serious violations of academic integrity will be reported to the Office of Academic Affairs.”

**Academic Resource Center:**

Western State College seeks to provide reasonable accommodations for all qualified persons with disabilities. This College will adhere to all applicable federal, state and local laws, regulations, and guidelines with respect to providing reasonable accommodations as required affording equal educational opportunity. It is the student's responsibility to register with the Academic Resource Center and to contact the faculty member in timely fashion to arrange for suitable accommodations.

**Course changes/syllabus Policy:**

This syllabus represents the planned activities for this course. Any changes will be announced and discussed in class.

## ***Area II – Natural Sciences Goals for General Education courses***

Students will:

- demonstrate knowledge of scientific viewpoints.
- use the scientific method.
- evaluate the impacts of science and technology on society.
- demonstrate scientific literacy.

### **Essential skills**

#### *Mathematics*

1. Selecting data from information provided that are relevant to solving a problem
2. Using various methods, such as algebraic, geometric, numerical, graphical, or statistical reasoning to solve problems within the discipline
3. Interpreting and drawing inferences from mathematical models, such as formulas, graphs, and tables
4. Generalizing from specific patterns and phenomena to more abstract principles
5. Proceeding from abstract principles to specific applications
6. Representing mathematical information symbolically, graphically, numerically and verbally
7. Estimating and verifying answers to mathematical problems to determine reasonableness, comparing alternatives, and selecting optimal results, recognizing that mathematical and statistical methods have limitations

#### *Reasoning*

1. Understanding how the impact of issues and information in the discipline relate to other disciplines and to society
2. Recognizing a problem, finding questions about the problem, and identifying arguments about the problem
3. Using appropriate methods of reasoning to state and support a position and to recognize other points of view
4. Considering different points of view and basic ideas in those points of view
5. Drawing an appropriate conclusion based on reliable evidence

#### *Written Communication*

1. Reading and writing in different disciplines using vocabulary, formats, and documentation for that discipline
2. Using a variety of research tools to select appropriate primary and secondary sources
3. Applying knowledge of syntax, grammar, punctuation, and spelling
4. Focusing on a main point