

PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS

**PRINCIPLES OF CHEMISTRY
CHEM 1010**

Class Hours: 3.0

Credit Hours: 4.0

Laboratory Hours: 3.0

Revised: Spring 2012

Catalog Course Description:

Atomic structure, periodic law, bonding, gas laws, liquid and solid states, solutions, acids and bases, oxidation and reduction reactions and equilibrium. Course includes three hours of lecture and three hours of laboratory applications each week.

Entry Level Standards:

Two years of high school algebra or one year of high school algebra and one year of high school geometry are necessary for entrance to the course. Reading/writing at the college level is also expected.

Prerequisites:

Two years of high school algebra and completion of Learning Support math requirements and MATH 1030.

Textbook(s) and Other Course Materials:

Textbook: Smith. *General, Organic & Biological Chemistry*, 1st ed.
McGraw-Hill, 2010. ISBN: 978-0-07-302657-2. Approximate price: \$180

Lab Manual: Bettelheim & L. *Experiments for Introduction to General, Organic, & Biochemistry*. Thomson Learning, 2006. ISBN: 978-0-534-61385-3.
Approximate price: \$55

Calculator: A calculator **is required** for this class. Bring your calculator **every day**. **Some calculators are NOT PERMITTED. YOU MAY NOT USE A TI-86 OR TI-83 CALCULATOR ON YOUR EXAMS. You must have a non-programmable calculator with a log function. IF YOU DON'T HAVE THE CORRECT CALCULATOR YOU CANNOT TAKE THE TEST!**

I. Week/Unit/Topic Basis: (TENTATIVE)

Week	Topic
1	Introduction to the syllabus, on-line materials, course access, and how to study for this class. This is not the class for pre-med, pharm, engineering etc. CH 1
2	Ch 1 Matter and Measurement
3	Ch 2 and Ch 10: Atoms and Periodic Table, Nuclear Chemistry
4	Ch 3 and Ch 4: Ionic and Covalent Compounds

5	Ch 5: Chemical Reactions
6	Ch 5 continued
7	Ch 5 and Ch 6: Energy Changes, Reaction Rates, and Equilibrium
8	Ch 7: Gases, Liquids, Solids
9	Ch 7 continued
10	Ch 8: Solutions
11	Ch 8 continued
12	Ch 8 continued
13	Ch 9: Acids and Bases
14	Ch 9 continued
15	Final Exam

II. Course Goals*:

The course will:

- A. Understand the fundamental concepts of atomic structure, molecular structure, and bonding. V. 1, 3, 4; VII. 1
- B. Predict properties of elements from the periodic table based on an acquired knowledge of periodic law. V. 1, 2, 3, 4, 5
- C. Apply the laws of chemistry and utilize the necessary mathematics to solve problems in chemical relationships. V. 1, 2, 3, 4, 5; VI. 2, 6
- D. Understand the fundamental concepts of kinetic molecular theory. V. 1, 2, 3, 4
- E. Demonstrate knowledge of the nature and behavior of electrolytes. V. 1, 2, 3, 4
- F. Identify nuclear particles, balance nuclear equations, and distinguish between nuclear fission and fusion. V. 1, 2, 3, 4, 5

*Roman numerals after course objectives reference TBR's general education goals.

III. Expected Student Learning Outcomes*:

The student will be able to:

1. Perform mathematical calculations pertaining to unit conversions, significant figures, quantitative chemical relationships, density, solution concentrations, dilutions, pH and pOH, hydronium and hydroxide ion concentrations, titrations, half-life of radioactive isotopes, gas laws, and colligative properties. C
2. Describe fundamental chemical concepts including atoms, subatomic particles, formation of ions, moles, and molecules. A
3. Write the electronic structure of an atom and predict properties of the elements using the

- periodic table. A, B
4. Draw Lewis structures for the elements and compounds, predict shape and polarity of covalent compounds. A, B, C
 5. Write and balance chemical equations. A, C
 6. Determine oxidation numbers, name compounds and write their formulas. A, C
 7. Label bond type(s) for an element or compound and describe molecular type. A, D
 8. Classify chemical reactions. A, C
 9. Explain kinetic molecular theory and how it relates to gases, liquids, and solids. D
 10. Examine the dissolution process and colligative properties. A, D, E
 11. Recognize the different acid-base theories, distinguish between strong vs. weak acids and bases and understand their reactions, and understand buffer solutions. A, B, C
 12. Apply the concepts of chemical equilibria and chemical kinetics, and determine the equilibrium and rate constants. A, B, D
 13. Recognize electrolytes and understand their behavior. A, B, E
 14. Identify nuclear particles and balance nuclear reactions. C, F
 15. Write radioactive decay of a nuclide and determine its rate of decay and half-life. A, F
 16. Compare and contrast nuclear fusion and fission. F
 17. Apply the scientific method and describe its applications in chemistry and in everyday life.
A

* Capital letters after Expected Student Learning Outcomes reference the course goals listed above.

IV. Evaluation:

A. Testing Procedures: 75 % of grade

Chapter tests & quizzes:

4 exams will be given (100 pts each), along with 4 quizzes (50 pts each). Exams will be given in a recurring format with multiple choice, calculations, and discussion questions. **You may replace your lowest score with the score of your Final Exam. THERE WILL BE NO EXTRA CREDIT ASSIGNMENTS IN THIS CLASS.**

Pop Quizzes: **May be given during any class period, or LAB PERIOD, except when a test is scheduled. Points from quizzes will be included in the lecture grade at the discretion of the instructor.**

Comprehensive final exam: 100 points. **The final exam is an ACS standardized exam. 60 questions in 60 minutes.**

All students are required to take comprehensive final exams in order to receive credit

for the course.

Tests may be made up only if the student can show, by contacting the instructor BEFORE the scheduled exam, that the absence is excused (doctor/hospital visit, funeral), including appropriate documentation. Make up tests are permitted only if the instructor agrees. Any other missed tests will count as a zero.

B. Laboratory Expectations: 25% of grade This includes Lab Reports and Final Exam

A comprehensive lab final will be given on the last day of lab. **All students are required to take the lab final exam in order to receive credit for the course. Lab is important! Please take it seriously.**

Attendance is required for scheduled lab meetings. Lab report sheets must be completed in **INK. Contact lenses, sandals, or open-toed shoes may not be worn in the laboratory. Also short shorts and miniskirts are not permitted in the lab.**

C. Field Work:

N/A

D. Other Evaluation Methods:

Homework Problems: You are strongly encouraged to work ALL of the assigned problems—I do not give “busy work”! If it is important, it will show up in problems assigned from the text and/or “problem sets” that I distribute during lecture. These are not graded assignments; you are expected to work them out on your own.

Help: Please e-mail me or come to office hours as soon as you start having trouble in working the problems. Also you may obtain free tutoring at the *Learning Center* in 330 ERC (check schedule at <http://www.pstcc.edu/learn/scienceu06.html>).

V. Policies:

A. Attendance Policy:

Pellissippi State expects students to attend all scheduled instructional activities. As a minimum, students in all courses (excluding distance learning courses) must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. Individual departments/programs/disciplines, with the approval of the vice president of Academic Affairs, may have requirements that are more stringent. In very specific circumstances, an appeal of the policy may be addressed to the head of the department in which the course was taken. If further action is warranted, the appeal may be addressed to the vice president of Academic Affairs.

B. Academic and Classroom Misconduct:

Academic misconduct committed either directly or indirectly by an individual or group is subject to disciplinary action. Prohibited activities include but are not limited to the following practices:

- Cheating, including but not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments.
- Plagiarism, including but not limited to paraphrasing, summarizing, or directly quoting published or unpublished work of another person, including online or computerized services,

without proper documentation of the original source.

- Purchasing or otherwise obtaining prewritten essays, research papers, or materials prepared by another person or agency that sells term papers or other academic materials to be presented as one's own work.
- Taking an exam for another student.
- Providing others with information and/or answers regarding exams, quizzes, homework or other classroom assignments unless explicitly authorized by the instructor.
- Any of the above occurring within the Web or distance learning environment.

C. Accommodations for disabilities:

Students who need accommodations because of a disability, have emergency medical information to share, or need special arrangements in case the building must be evacuated should inform the instructor immediately, privately after class or in her or his office. Students must present a current accommodation plan from a staff member in Services for Students with Disabilities (SSWD) in order to receive accommodations in this course. Services for Students with Disabilities may be contacted by going to Goins 127, 132, 134, 135, 131 or by phone: 539-7153 or TTY 694-6429. More information is available at <http://www.pstcc.edu/sswd/>.

D. Other Policies

Visitors are **not** allowed in the classroom or the laboratory.

Cell phones are **not** to be used in the classroom at any time. Please turn off (or on vibrate) all cell phones and pagers or other electronic devices that make audible sounds that may disturb the classroom environment as deemed by the instructor.