

PELLISSIPPI STATE COMMUNITY COLLEGE  
MASTER SYLLABUS

**CONCEPTS OF CHEMISTRY**  
**CHEM 1310**

**Class Hours: 2.0**

**Credit Hours: 3.0**

**Laboratory Hours: 3.0**

**Revised: Spring 2012**

**Catalog Course Description:**

Composition of matter, atomic structure, bonding, gas laws, liquid and solid states, solutions, acids and bases, chemical reactions, nuclear chemistry and technology, polymers, household chemistry, and introduction to environmental and organic/medicinal chemistry. 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. This course is intended for non-science and non-pre-professional students who are considering a career in education. Must be able to read and write at the college level.

**Prerequisites:**

MATH 1030

**Textbook(s) and Other Course Materials:**

Textbook: Suchocki, John. *Conceptual Chemistry*, 3<sup>rd</sup> ed. Pearson/Benjamin Cummings, **2004**.  
Ball, David W. *Essential Algebra for Chemistry Students*, 2<sup>nd</sup> ed. Brooks/Cole, **2006**.

Lab Manual: There is no lab manual for this course. All labs and activities will be provided either in hardcopy format or via download from D2L.

Ancillary Materials:        **Scientific Calculator (get a cheap one from Wal Mart, etc.)**

This course will be a "Web Enhanced" course utilizing D2L. Point your Web Browser to Online Courses, <https://elearn.pstcc.edu/> to Log-On. This webpage will be used for distribution of assignments, handouts, links to Web-based assignments and databases, and other information as the semester progresses. Check the site frequently for new items and info!

NOTE: this course will be activity/discussion-based; there will be **no makeup** sessions for any activities missed [see Section V for more details].

**I. Week/Unit/Topic Basis:**

<b>Unit</b>	<b>Topic</b>
1	Introduction to the course; Chemistry Is a Science; Properties of Matter [Chap. 1]; Arithmetic of Chemistry [Chaps. 1]
2	Atoms and Atomic Structure [Chap. 2-5]

- 3 Nuclear Chemistry & Technology and Impact on Society [Chap. 4-5]
- 4 Chemical Bonding, Molecular Modeling [Chap. 6]
- 5 Solutions & concentrations [Chap. 7]
- 6 Chemical reactions [Chap. 9]
- 7 Acids, Bases Reactions [Chap. 10]
- 8 Polymers & Materials Chemistry [Chap. 18]

## II. Course Goals\*:

- A. Guide students in their understanding the fundamental concepts of atomic structure, molecular structure, and bonding. V.1, 3, 4; VII.1
- B. The course will enhance the students' ability to 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. Enhance the understanding of the Particulate Nature of Matter and basic kinetic molecular theory. V.1, 2, 3, 4
- E. Guide students to understand nuclear particles, balance nuclear equations, and distinguish between nuclear fission and fusion. V.1, 2, 3, 4, 5

\*Roman numerals after course objectives reference goals of the Natural Sciences program.

## III. Expected Student Learning Outcomes\*:

The student will be able to:

1. Demonstrate problem-solving ability with emphasis on chemical word problems and performance of mathematical calculations pertaining to unit conversions, significant figures, quantitative chemical relationships, density, solution concentrations, dilutions. (C, E)
2. Use appropriate methods and equipment for making chemical observation and measurements in a laboratory setting. (A, B, C)
3. Employ the correct usage of chemical terms, name chemical compounds, understand and prediction of chemical behaviors. (A, B, D, E)
4. Apply the fundamental chemical concepts including atoms, subatomic particles, formation of ions, moles, molecules by identifying and writing formulas and equations, and other chemical notation. (A, E)
5. Draw and analyze 3-D models of Lewis structures for the elements and compounds, predict shapes and polarity of covalent compounds. (A, B, D)
6. Determine oxidation numbers and write formulas of compounds. (A, B, C)
7. Label bond type(s) for an element or compound and describe molecular type. (A, B, D)
8. Classify chemical reactions. (A, B, E)

9. Compare and contrast properties of the three phases of matter utilizing the Particulate Nature of matter and basic kinetic molecular theory. (A, D)
10. Understand the dissolution process. (A, D)
11. Understand and recognize the different acid-base theories, distinguish between strong vs. weak acids and bases and understand their reactions. (A, B, C)
12. Identify nuclear particles and balance nuclear reactions. (E)
13. Understand radioactive decay of a nuclide and determine its rate of decay and half-life. (E)
14. Distinguish between nuclear fusion and fission. (E)

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

#### IV. Evaluation:

##### A. Testing Procedures: 55 % of grade

Unit tests: 40% of the course grade: FIVE (5) tests will be given. **The LOWEST test will be dropped.**

**There are NO MAKEUP Tests.** Tests will be multiple choice, short answer, fill-in-the-blank, but mainly discussion/problem solving. There will be a “Lab Practical” question which allows students to analyze an experiment not performed in class, but covers related material.

Comprehensive final exam: 15% of the course grade. This exam will be multiple choice.

**All students are required to take the final exam in order to receive credit for the course.**

##### B. Laboratory Expectations: 40% of grade

1. Attendance is required for scheduled course meetings. There are NO MAKEUP Lab sessions.

**NOTE: Contact lenses are NOT recommended to be worn in the laboratory.**

2. A comprehensive lab final (chemistry lesson project) will be given on the last day(s) of class worth 5% of grade. This will consist of presentations of student-designed experiments/demos and discussions explaining a scientific concept either studied during the semester or one of student interest (with approval from the instructor).

**All students are required to complete the Lab final exam (project) in order to receive credit for the course.**

3. Lab technique/etiquette will be allotted as subjective points toward the lab grade as deemed by the instructor (25 points). Evaluations are based on cleanliness of lab areas, following instructions, and general abilities in conducting experiments as outlined in each activity.

4. Peer Evaluation of each group member’s participation and effort while working in the group throughout the semester. This portion of the grade will not constitute more than 25 points towards the total semester grade.

##### C. Field Work:

n/a

D. Other Evaluation Methods:

Homework Problems: You are strongly encouraged to work ALL of the assigned problems—the course does not have “busy work”! If it is important, it will show up in problems assigned from the text and/or “problem sets” that are distributed during class and on D2L. These are not graded assignments; you are expected to work them out on your own. The answers to odd-numbered Exercises and Problems are in Appendix C of the text. Other solutions will be made available by the instructor.

E. Grade Breakdown:

Summary of Assignments:

Exams	55%
Lab Expts.	40%
Expt/Demo Lab	5%
FINAL Exam	15%

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Grading Scale

90.0 - 100.0	A
87.5 - 89.9	B+
80.0 - 87.4	B
77.5 - 79.9	C+
70.0 - 77.4	C
60.0 - 69.9	D
Below 60.0	F

**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 Dishonesty:

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:

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.

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