

PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS

GENERAL CHEMISTRY I
CHEM 1110

Class Hours: 3.0

Credit Hours: 4.0

Laboratory Hours: 3.0

Revised: Spring 2017

Catalog Course Description

Modern atomic theory, chemical bonding, stoichiometry, kinetic. Course includes three hours of lecture and three hours of laboratory applications each week.

Prerequisites

ACT math score of at least 22; or MATH 1130 or MATH 1710 or MATH 1730

Textbook(s) and Other Reference Materials Basic to the Course

Burdge and Overby, Chemistry: Atoms First, McGraw -Hill, 2012 SECOND EDITION.

CHEM 1110 Lab Notebook containing experiments (discussion, procedure, report sheets and homework sheets) and problem sets.

Programmable/graphing calculators may not be used on the tests in this course. A non-programmable scientific calculator is required (ex. TI - 30X).

Week/Unit/Topic Basis

Week	Topic
1	The Science of Change, ch. 1.1-1.6
2	Atoms and the Periodic Table, ch. 2.1-2.7
3	Quantum Theory and Electronic Structure, ch. 3.1, 3.2, 3.4, 3.7-3.10, ch. 5.4
4	Periodic Trends, ch. 4.1-4.6: Ionic and Covalent Compounds, ch. 5.1-5.6
5	Composition Stoichiometry, ch. 5.7-5.10
6	Representing Molecules, ch. 6.1-6.6
7	Molecular Structures, ch. 7.1-7.6, 7.8
8	Liquids, ch. 12.1-12.2, Chemical Reactions, ch. 8.1
9	Chemical Reactions, ch. 8.3-8.5
10	Aqueous Chemical Reactions, ch. 9.1-9.5
11	Energy Changes in Chemical Reactions, ch. 10.1, 10.4, 10.6
12	Gases, ch. 11.1-11.6

- 13 Gases, ch. 11.7, 11.8, Solids, ch. 12.3-12.6
- 14 Review for Final Exam if time permits
- 15 FINAL EXAM

Course Goals*

NOTE: Roman numerals after course objectives reference TBR's General Education Goals.

The course will

- A. Expand student understanding of the fundamental concepts of atomic structure, molecular structure and chemical bonding. V.3, V.4
- B. Enhance student understanding of properties of chemical elements and compounds based on acquired knowledge of periodic law. V.3, V.4
- C. Increase student ability to apply the laws of chemistry and utilize mathematics to solve problems in chemical relationships. VI, V.1, V.2, V.4
- D. Expand student knowledge of the fundamental concepts of kinetic molecular theory. V.4
- E. Guide students toward enhanced critical thinking skills. I.1, V.5
- F. Foster the ability to process skills related to scientific experimentation using the scientific method (purpose, procedure, collect data, tabulate/graph and conclusion). VI.5, VI.6, V.2
- G. Guide students toward effective interpretation and evaluation of chemical information. I.1, I.6, I.7, V.1, V.2, V.3, VI.5, VI.6, VII.

Expected Student Learning Outcomes

NOTE: Letters after expectations or SLO reference the Course Goals listed above.

The student will

- 1. Solve problems with metric system using dimensional analysis if necessary. C
- 2. Complete calculations with measurements using concept of significant figures. C
- 3. Solve density, specific gravity, and calorimetry problems. C, E
- 4. Differentiate between atom, molecule and mole. A
- 5. Calculate molar mass to determine percent composition. C
- 6. Derive chemical formulas from elemental composition (composition stoichiometry). A, C, E
- 7. Complete and balance chemical reactions. A
- 8. Solve percent purity, percent yield, and limiting reactant problems from a chemical reaction (reaction stoichiometry). B, C, E
- 9. List and describe the fundamental particles for an atom. A
- 10. Write the electronic structure for an atom or ion. A, B
- 11. Write and interpret the quantum numbers for a specific electron. A
- 12. Recall properties of an element using the periodic table. B
- 13. Name and/or write chemical substances and determine specific oxidation states. A, B

14. Draw Lewis structures for all chemical substances indicating bond types, molecular polarity, and possibility of resonance. A, B
15. Determine hybridization and describe with bond angle and shape. A
16. Classify chemical reactions. A
17. Classify a substance as an electrolyte. A
18. Calculate molarity and dilution problems. C
19. Describe physical states of substances using kinetic molecular theory and solve word problems. C, D, E.
20. Integrate calorimetry problems involved in phase changes. C, D, E
21. Read and study effectively the laboratory experiment prior to the meeting time. E, G
22. Perform laboratory experiments using proper techniques. F, G
23. Differentiate between endothermic and exothermic reactions. D
24. Calculate enthalpies of formation. C, D

Evaluation (1000 points)

Note: The lecture portion of this course is worth 750 points of the total grade.

Testing Procedures: 600 points

Chapter exams and/or alternative assignments (400 points)

Comprehensive final examination (200 points)

There are 5 chapter exams (100 points each) and a comprehensive departmental final exam (200 points). If all chapter exams are attempted the lowest exam grade may be dropped. If an exam is missed, then this grade is dropped. There are no make-ups after the scheduled exam date.

Laboratory Expectations: 250 points

The laboratory portion of the course is worth a total of 250 points. However, a student must earn at least 150 points (60%) to pass the course. Attendance is required for scheduled lab meetings.

Experiment report sheets are to be completed in ink and NOT pencil. No "white-out" allowed! Problem sets and the Lab Final Exam may be completed in pencil. All purpose statements and conclusions must be typed and plagiarism will not be tolerated! Safety eye wear must be worn during an experiment (code Z87). Shoes covering the entire foot required (no clogs/sandals/ballet flats) and legs must be fully covered (no tights/leggings/yoga pants) to enter the lab.

See lab schedule for additional information and specific requirements.

Field Work: N/A

Other Evaluation Methods: 150 points

For the remainder 150 points, each instructor has the option to give an extra exam and/or alternative assignments (quizzes, online homework, etc.) which may not be dropped.

Bonus points and/or extra credit given during the semester may not exceed 25 points.

Grading Scale:

900-1000	A
875-899	B+
800-874	B
775-799	C+
700-774	C
600-699	D
<600	F

Policies

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.

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.

Please see the Pellissippi State Policies and Procedures Manual, Policy 04:02:00 Academic/Classroom Conduct and Disciplinary Sanctions for the complete policy.

Accommodations for Disabilities

Students that 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 Disability Services (DS) in order to receive accommodations in this course. [Disability Services](http://www.pstcc.edu/sswd/) (<http://www.pstcc.edu/sswd/>) may be contacted via [Disability Services email](#) or by visiting Alexander 130.

Other Policies

Cell Phone Policy

Cell phones may not be used during class. Emergency situations must be discussed with the instructor.