

**PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS**

**PRINCIPLES OF CHEMISTRY
CHEM 1010**

Class Hours: 3.0
Laboratory Hours: 3.0

Credit Hours: 4.0
Revised: Fall 2017

Catalog Course Description

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

Prerequisites

High school algebra I and algebra II and ACT math score of at least 21 or MATH 1030 or equivalent course.

Textbook(s) and Other Course Materials

Denniston, et al. *General, Organic & Biochemistry*, 8th ed. McGraw-Hill, 2014.

A calculator is **required** for this class; please bring a calculator **every day**. A non-programmable calculator with a log function will be needed (ex: TI-30 series). Programmable calculators such as TI-83 or TI-86 are **NOT** allowed for use on exams.

Week/Unit/Topic Basis

Week	Topic
1	Introduction to the syllabus, on-line materials, course access, website for the text, and how to study for this class. Ch 1
2	Ch 1: Methods and Measurement, Ch 2: Atoms and the Periodic Table
3	Ch 2 and Ch 9: Nuclear Chemistry
4	Ch 3: Ionic and Covalent Compounds
5	Ch 3 and Ch 4: Calculations and the Chemical Equation
6	Ch 4 continued
7	Ch 4 continued
8	Ch 5: State of Matter: Gases, Liquids, Solids
9	Ch 5 continued
10	Ch 7: Energy, Rate, and Equilibrium
11	Ch 7 and Ch 6: Solutions
12	Ch 6 continued
13	Ch 8: Acids and Bases and Oxidation-Reduction
14	Ch 8 continued
15	Final Exam Period

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 bonding. V. 1, 3, 4; VII. 1
- B. Build the skills of the student in order to predict properties of elements from the periodic table based on an acquired knowledge of periodic law. V. 1, 2, 3, 4, 5
- C. Guide the student to 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. Expand student understanding of the fundamental concepts of kinetic molecular theory. V. 1, 2, 3, 4
- E. Enhance the student's knowledge of the nature and behavior of electrolytes. V. 1, 2, 3, 4
- F. Build the skills of the student to identify nuclear particles, balance nuclear equations, and distinguish between nuclear fission and fusion. V. 1, 2, 3, 4, 5

Expected Student Learning Outcomes

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

The student will

- 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

Evaluation

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

Testing Procedures: 600 points

Chapter exams (450-500 points)

Comprehensive final examination (100-150 points)

The final exam is an ACS standardized exam. (60 multiple choice questions in 60 minutes). ALL students are REQUIRED to take the comprehensive final exam in order to receive credit for the course. If five exams are given in a semester, the lowest exam grade may be replaced with the final exam grade.

Missed exams may be made up only if the instructor is notified within 24 hours of the scheduled exam time and is provided a valid, documentable excuse. However, missed exams must be made up within 2 days of the scheduled exam time. In all other cases, missed exams will be recorded as a zero. Students may not make up more than one missed exam. Students arriving late for an exam will not be given extra time.

Laboratory Expectations: 250 points

Attendance is required for all scheduled lab meetings. Students arriving exceptionally late or with multiple incidences of tardiness may be asked to leave or lose points at the instructor's discretion.

Students should dress appropriately for the laboratory. **Shoes must be closed toed and closed heeled. Legs must be covered completely.** Safety eye wear must be worn during every lab involving an experiment (code Z87). Students who are not appropriately attired for subsequent lab meetings will not be allowed to complete the lab assignment and will receive a zero.

See lab schedule for additional information and requirements.

Field Work: N/A

Other Evaluation Methods: 150 points

Each instructor has the option to give an extra exam and/or alternative assignments (quizzes, online homework, writing assignment, etc) which may not be dropped.

Bonus points and/or extra credit may be given during the semester at the instructor's discretion. This value is not to exceed 37.5 points (5% of the lecture portion of grade).

Grading Scale

900-1000	A
875-899	B+
80 -874	B
775-799	C+
700-774	C
600-699	D
< 600	F

Policies

Attendance Policy

Students are expected to attend and participate in **all** scheduled class, laboratory, or clinical sessions. Absences result in missed learning opportunities, lower grades, and, in many cases, failure for the course. Prompt and regular attendance enhances the likelihood of student achievement while also instilling habits that will prepare graduates for success in the workplace.

With the approval of the chief academic officer, individual faculty/programs/disciplines/departments may establish specific requirements for attendance in individual courses. If an attendance policy is requested, a consensus of at least 75% must be reached by all faculty, program coordinators, and deans associated with the course before the request is submitted to the chief academic officer. Each course syllabus will specify attendance requirements and the specific academic consequences entailed by those requirements.

Students enrolled in CHEM 1010 – *Principles of Chemistry* must attend at least 75% of scheduled lecture meetings as well as 60% of scheduled laboratory meetings in order to receive credit for the course. This attendance requirement has been approved by Natural & Behavioral Sciences Dean and Chief Academic Officer.

Financial Aid recipients are responsible for meeting attendance requirements for institutional, State and Federal Aid in order to maintain eligibility.

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/) (www.pstcc.edu/sswd/) may be contacted via [Disability Services email](#) or by visiting Alexander 130

Other Policies

Students should prepare for class by reading assignments prior to the lecture. Please bring textbooks and other pertinent materials to class. Important course materials will be posted on D2L or may be sent by email. It is the student's responsibility to make sure that they can access both through the PSTCC homepage. If you have difficulty please call the helpdesk (694-6537) or go to the open computer lab located on the third floor of the ERC.

Lecture attendance is extremely important for those wishing to complete this chemistry course successfully. It is the student's responsibility to obtain notes and/or handouts if they must be absent or if they are late for a lecture.

Classroom disruptions during lecture or laboratory, any form of communication during testing, or any other form of behavior that may prove distracting to others will not be tolerated. Unacceptable behavior for the classroom includes but is not limited to: (1) use of a cell phone for either conversation or texting, (2) talking during lecture for any purpose other than asking or answering a question from the instructor, (3) eating during lecture or lab, (4) inappropriate use of a laptop and/or (5) arriving late or leaving early.