PELLISSIPPI STATE COMMUNITY COLLEGE  
MASTER SYLLABUS  
PRINCIPLES OF CHEMISTRY  
CHEM 1010  

Class Hours: 3.0  
Laboratory Hours: 3.0  
Credit Hours: 4.0  
Revised: Spring 2014  

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:  

Calculator: 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).  

I. Week/Unit/Topic Basis:  

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to the syllabus, on-line materials, course access, website for the text, and how to study for this class. Ch 1</td>
</tr>
<tr>
<td>2</td>
<td>Ch 1: Methods and Measurement, Ch 2: Atoms and the Periodic Table</td>
</tr>
<tr>
<td>3</td>
<td>Ch 2 and Ch 9: Nuclear Chemistry</td>
</tr>
<tr>
<td>4</td>
<td>Ch 3: Ionic and Covalent Compounds</td>
</tr>
<tr>
<td>5</td>
<td>Ch 3 and Ch 4: Calculations and the Chemical Equation</td>
</tr>
<tr>
<td>6</td>
<td>Ch 4 continued</td>
</tr>
</tbody>
</table>
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


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: (1000 points)

   Online Assignments: These assignments will account for 5% of the overall course grade (50 pts). The student will use D2L to complete the assignments. The format will be multiple choice without time constraints. Multiple answer submissions may be allowed.

   Exams & quizzes: 4 exams will be given (100 pts each) along with 4 quizzes (150 pts total). Exams will be given in a recurring format with multiple choice and short answer (calculations). **The student may replace the lowest exam score with the score of the Final Exam.**

   Comprehensive final exam: 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.

   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.

B. Laboratory Expectations: 25% of grade  This includes Lab Reports and Final Exam
Attendance is required for all scheduled lab meetings. Students arriving exceptionally late or with multiple incidences of tardiness may 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.

Students must read the assigned experiment prior to the laboratory meeting and complete the pre-lab question sheet. The pre-lab question sheet is due at the beginning of the current lab period. The report sheet is to be completed during lab; the report sheet and post-lab questions are due at the beginning of the following lab period. **No late assignments accepted.**

C. Field Work:

N/A

D. Other Evaluation Methods:

Bonus points and/or extra credit may be given during the semester at the instructor’s discretion.

E. Grading Scale:

<table>
<thead>
<tr>
<th>Points</th>
<th>grade</th>
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<tbody>
<tr>
<td>900 – 1000</td>
<td>A</td>
</tr>
<tr>
<td>875 - 899</td>
<td>B+</td>
</tr>
<tr>
<td>800 - 874</td>
<td>B</td>
</tr>
<tr>
<td>775 - 799</td>
<td>C+</td>
</tr>
<tr>
<td>700 – 774</td>
<td>C</td>
</tr>
<tr>
<td>600 - 699</td>
<td>D</td>
</tr>
<tr>
<td>Below 600</td>
<td>F</td>
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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.

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

C. 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 Services for Students with Disabilities (SSWD) in order to receive accommodations in this course. Services for Students with Disabilities may be contacted by sending email to disabilityservices@pstcc.edu, or visiting Goins 127, 132, 134, 135, 131. 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.