PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS

PRINCIPLES OF CHEMISTRY
CHEM 1010

Class Hours: 3.0  Credit Hours: 4.0
Laboratory Hours: 3.0  Revised: Fall 2015

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:
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:


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). Programmable calculators such as TI-83 or TI-86 are NOT allowed for use on exams.

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>
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<tr>
<td>3</td>
<td>Ch 2 and Ch 9: Nuclear Chemistry</td>
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<tr>
<td>4</td>
<td>Ch 3: Ionic and Covalent Compounds</td>
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<tr>
<td>5</td>
<td>Ch 3 and Ch 4: Calculations and the Chemical Equation</td>
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</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:** (1000 points)

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

A. Testing Procedures: 600 points

   Chapter exams (500 points)
   Comprehensive final examination (100 points)

   There are 5 chapter exams (100 points each) and a comprehensive final exam (100 points). If all chapter exams are attempted 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.

B. 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.

C. Field Work:

N/A

D. 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).

E. Grading Scale:

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<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 Disability Services (DS) in order to receive accommodations in this course. Disability Services may be contacted by sending email to disabilityservices@pstcc.edu, or by visiting Alexander 130. More information is available at http://www.pstcc.edu/sswd/.

D. 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.