

**PELLISSIPPI STATE COMMUNITY COLLEGE**  
**MASTER SYLLABUS**  
**GENERAL CHEMISTRY II**  
**CHEM 1120**

**Class Hours: 3.0**

**Lab Hours: 3.0**

**Credit Hours: 4.0**

**Revised: Fall 2017**

**Catalog Course Description**

Chemical equilibrium, acid-base chemistry, electrochemistry, introduction to organic chemistry. Course includes 3 hours of lecture and 3 hours of laboratory applications each week.

**Prerequisite**

CHEM 1110

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

- Burdge and Overby. *Chemistry – Atoms First*, 2<sup>nd</sup> edition. McGraw Hill, 2015.
- CHEM 1120 Lab Notebook containing experiments (discussion, procedure, report sheets and homework sheets) and problem sets.
- A non-programmable scientific calculator is required (ex. TI - 30X). **Programmable calculators may not be used on the tests in this course.**

**Week/Unit/Topic Basis**

**Week      Topic**

1. Solutions (review terms, concentrations and dilutions), ch. 9.5, 13.3
2. Solutions (dissolution process) ch. 13; Solutions (colligative properties) ch. 13
3. Acids, bases and salts (review), ch. 9.3, ch. 16.1-16.3
4. Chemical equilibrium, ch. 15.1-15.3; 15.5-15.6
5. pH scale, strong and weak acids and bases, ch. 16.3-16.9
6. Ionic equilibria I: acids and bases (salts and buffers), ch. 16.10-16.12, 17.1-17.2
7. Ionic equilibria II: acids and bases (titration curves). ch. 17.3
8. MIDTERM EXAM; Ionic equilibria III: ‘insoluble’ salts (solubility product principle, K<sub>sp</sub>) ch. 17.4-17.5;
9. Chemical kinetics, ch. 19.1-19.8
10. Nuclear chemistry, ch. 20.1-20.8
11. Balancing oxidation-reduction reactions, ch. 9.4, 18.1
12. Redox titrations; Electrochemistry, ch. 18.2-18.8
13. Redox titrations; Electrochemistry, ch. 18.2-18.8
14. Organic chemistry (a brief introduction)
15. FINAL EXAM

**Course Goals**

NOTE: Roman numerals after course goals reference General Education Goals

The course will

- A. Develop student skills in mathematical calculations related to solution chemistry. VI.1, VI.4

- B. Provide knowledge of the nature and behavior of electrolytes. V.4
- C. Teach methods of balancing redox equations, illustrate the concepts of electrochemistry and provide practice in the related mathematical calculations. VI.4, V.4
- D. Enhance understanding and performance of mathematical calculations on single and multiple ionic equilibria. VI.2, VI.4, V.4
- E. Expand student understanding of nuclear particles, nuclear equations and the processes of nuclear fission and fusion. V.3, V.5

### **Expected Student Learning Outcomes**

NOTE: Capital letters after expected student learning outcomes reference the course goals above.

The student will

1. Work solution problems that involve dilutions and expressing various concentrations. A
2. Understand the dissolution process and colligative properties. A
3. Solve colligative property problems. A
4. Understand and recognize the different acid-base theories. B
5. Distinguish between strong vs. weak acids and bases and understand their reactions. B
6. Understand the procedure and calculations involved in a titration. A, B, D
7. Understand the concepts involving the chemical equilibrium constant, K. A
8. Recognize electrolytes and understand their behavior. B
9. Determine pH and solve calculations involving the concentration of the hydrogen ion. A, B, D
10. Understand the concept of buffer solutions. A, B, D
11. Understand and perform calculations involving salt hydrolysis. A, B, D
12. Determine the solubility product constant,  $K_{sp}$ . A, B, D
13. Understand the concepts of chemical kinetics and determine rate constant, k. A, D
14. Identify nuclear particles and balance nuclear reactions. E
15. Understand radioactive decay of a nuclide and determine its rate of decay and half-life. E
16. Distinguish between nuclear fusion and fission. E
17. Balance oxidation reduction reactions by the change in oxidation number method and the half reaction method. C
18. Solve redox problems. C
19. Diagram electrolytic and voltaic cells and understand the redox reactions involved. C
20. Determine standard electrode potentials and use the Nernst equation if standard conditions do not exist. C

### **Evaluation (1000 points)**

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.

## Other Evaluation Methods

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

## 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/>) 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.