

# Chemistry 146 – General Chemistry II A, B, F – Syllabus

Widener University, Spring 2008

**Lecture** MWF, 9:00 – 9:50 am KB 149; **Test Period** Fri, 3:00 – 4:30 pm, location TBA  
**Workshops:** Sec A (KB 211), Tu 12:30 – 1:45 pm; Sec B (KB 149), Tu 9:30 – 10:45 am;  
Sec F (KB 211), Tues 2:00 – 3:15 pm

Dr. Andrea E. Martin  
Kirkbride 466B  
(610) 499-4515  
martin@pop1.science.widener.edu  
Web: www.science.widener.edu/~martin

**Office Hours**  
M, W, F: 10:30 – 11:30 am  
Tu: 3:30 – 4:30 pm  
W: 1:30 – 2:30 pm

## Textbook

- a. Required Text:
  - i. Kotz, J.; Treichel, P. *Chemistry & Chemical Reactivity 6th ed.*; Thomson, 2006.
  - ii. Banks, A. *Student Solutions Manual*; Thomson, 2006.
- b. Supplemental Text (recommended):
  - i. Townsend, J. *Student Study Guide*; Thomson, 2006.

**Course Description:** This is the second semester of a two semester introductory chemistry sequence for science, engineering and pre-med programs. Included are the following topics: kinetics, equilibria, acid-base reactions, solution properties, thermodynamics and electrochemistry. Three hours lecture and one hour recitation.  
Pre-requisite: Chem 145

## Chemistry 146 Goals and Objectives (from Widener University Chemistry Department)

1. Students will be able to use molecular theory to explain and apply colligative properties.
2. Students will be able to use numerical information to solve chemical problems and to communicate.
3. Students will be able to calculate theoretical results for chemical experiments.
4. Students will be able to use kinetics to determine the state of a system as a function of time.
5. Students will be able to calculate the equilibrium state of an ideal chemical system.
6. Students will be able to use thermodynamic concepts involving enthalpy and entropy to determine the state of a system after a chemical reaction.
7. Students will be able to identify electrochemical reactions, determine their thermodynamic state

**Office Hours:** I will be available in my office during scheduled office hours. Any changes in my schedule will be posted on my office door. At other times I am happy to help you, if I have time. Feel free to call or e-mail and make an appointment if you need extra help. You are strongly encouraged to ask questions and seek help early. Chemistry is challenging. When you do not understand something, ask!

**Cheating and Plagiarism: Cheating and Plagiarism will not be tolerated and are grounds for FAILURE in the course.** The University's policy on cheating and other forms of academic fraud will be strictly enforced. When in doubt about what is acceptable, ask the instructor. You will do some work in small groups and interaction is strongly encouraged in this setting. You, however, are ultimately responsible for the material. Working together on homework problems is acceptable, but *you must reference other people's ideas*. Quizzes and Exams must be your own work. For additional information read "What is Plagiarism?" on Dr. Van Bramer's web site for Chem 145.

**Academic Grievance:** A copy of the appeal procedure for student academic grievances is available in the Science Division office.

**Grading:** +/- grades are used. Your grade is based upon performance on the following, which total 800 points:

- a. 100 points – Quizzes and workshop assignments
- b. 50 points – Test corrections applied to the first 2 regular exams
- c. 50 points – Group presentations, details to be provided; beginning in April
- d. 400 points – Exams. There will be four exams during the semester. The schedule is given below.
  - a. Exam 1 – Friday, Feb. 1, 3:00-4:30 pm, location to be announced
  - b. Exam 2 – Friday, Feb. 22, 3:00-4:30 pm, location to be announced
  - c. Exam 3 – Friday, Mar. 28, 3:00-4:30 pm, location to be announced
  - d. Exam 4 – Friday, Apr. 25, 3:00-4:30 pm, location to be announced
- e. 200 points – Final Exam – to be scheduled by the University during final exams; the final will be cumulative.
- f. Attendance will be kept and will be a factor in borderline grades.

**Make Up Exams:**

- a. If you have advance notice of an absence you must make arrangements with the instructor before the exam is given. Failure to do so will result in a ZERO for the exam.
- b. If you are unable to take an exam and do not have advance notice you must have an acceptable and documented excuse, be prepared to document your absence, and contact the instructor **before** the next class meeting, otherwise you will receive a ZERO for the exam. The instructor will be the sole judge as to whether or not an absence is excusable.
- c. Late, undocumented or unacceptable absences result in a zero on the exam.
- d. If a makeup exam is given, your grade will be the LOWEST of the following:
  - i. Your score for the makeup exam
  - ii. Your final exam grade.

There are NO makeups for missed quizzes. Missed quizzes will receive a zero.

**Changes to Syllabus** – changes to the syllabus will be announced in class and/or e-mailed via Campus Cruiser. If you are absent from a class, it is your responsibility to obtain the information.

## Tentative Schedule for Lecture and Workshop Topics and Homework Assignments

**You are responsible for reading the assigned pages BEFORE lecture. Homework problems should be done no later than the lecture following the lecture when the subject was covered. Pop quizzes on homework questions may be given at any time without warning! The assigned problems are the minimum you should do; the more you practice, the more successful you will become at problem-solving. This schedule is subject to change – we may be either ahead or behind. Any changes will be announced in class. If time permits, material from Chapter 21 will be covered.**

Week of Jan. 14:

- a) Kinetic-molecular theory, intermolecular forces, hydrogen bonding:  
Chapter 13, p 588 – 606; problems 1-10
- b) Liquids: Chapter 13, p 606 – 616; problems 11, 13, 15, 17, 18, 19, 20, 21
- c) Solids: Chapter 13, p 616 – 634; problems 23, 25, 27, 29, 31, 32, 33, 39, 44, 47, 65, 67, 69, 71

Weeks of Jan. 21 and 28: (no class on Jan. 21, MLK Holiday)

- a) Solutions: Chapter 14, p 656 – 672; problems 1, 3, 5, 7, 9, 11, 13, 15, 17, 19
- b) Colligative Properties: Chapter 14, p 672 – 691; problems 21, 23, 25, 27, 29, 35, 37, 39, 41, 49, 53, 59, 67, 91, 93, 97

Weeks of Feb. 4 and 11:

- a) Kinetics: Chapter 15, p 698 – 712; problems 1, 3, 5, 9, 11, 15, 17, 25
- b) Kinetics: Chapter 15, p 712 – 742; problems 33, 37, 41, 46, 47, 55, 59, 65, 89

Weeks of Feb. 11 and 18:

- a) Equilibria: Chapter 16, p 756 – 772; problems 1, 3, 5, 7, 11, 13, 15
- b) Equilibria: Chapter 16, p 772 – 789; problems 21, 23, 25, 29, 31, 33, 49, 63, 65, 67

Weeks of Feb. 25 and Mar. 10 (week of March 3 is Spring Break Week):

- a) Acids/Bases: Chapter 17, p 796 – 806; problems 1, 2, 3, 4, 5, 7, 9, 10, 11, 13, 14
- b) Acids/Bases: Chapter 17, p 806 – 826; problems 15, 17, 19, 21, 29, 33, 35, 37, 41, 45, 47, 49, 51, 53, 55, 57, 59, 63
- c) Acids/Bases: Chapter 17, p 826 – 839; problems 69, 71, 77, 89, 93, 103, 107, 111

Week of Mar. 17 (no class Friday, Mar. 21, Spring Holiday)

- a) Buffers: Chapter 18, p 848 – 861; problems 1, 3, 5, 7, 9, 11, 15, 17, 19

Weeks of Mar. 24 and 31:

- a) Titrations: Chapter 18, p 861 – 872; problems 23, 25, 29, 77, 81
- b) Salts and Precipitation Reactions: Chapter 18, p 873 – 893; problems 33, 35, 37, 39, 43, 45, 55, 59, 69, 71, 89

Weeks of Apr. 7 and 14 (no class Friday, April 18, Student Project Day)

- a) Thermochemistry: Chapter 19, p 902 – 921; problems 1, 3, 5, 7, 9, 13, 17, 19
- b) Thermochemistry: Chapter 19, p 921 – 934; problems 21, 23, 25, 29, 33, 37, 39, 43, 45, 75

Weeks of Apr. 21 and 28 (last day of class, Wednesday, April 30)

- a) Electrochemistry: Chapter 20, pages 942 – 962; problems 1, 3, 5, 7, 9, 10, 11, 12
- b) Electrochemistry: Chapter 20, pages 962 – 990; problems 13, 17, 19, 21, 25, 31, 45, 51, 53, 57, 71, 81