

Equinox Program

Course Title: Advanced Placement Chemistry

Course Description

This course focuses on thermodynamics, thermochemistry, the physical behavior of gases, states and structure of matter, chemical equilibrium and kinetics, and various chemical reactions. Daily laboratory work emphasizes competency in solving chemical calculations and problems. In the accelerated format, this is a rigorous and lab-heavy course requiring significant study and dedication. Upon successful completion, students are prepared to take the Advanced Placement Chemistry exam.

Essential Questions

- How does chemistry play a role in our everyday lives?
- How is chemistry fundamental in solving many of today's problems and in the development of new products for the future?

Outcomes

Upon successful completion of this course, students will:

- Know the binding forces of matter, the types of crystalline solids, and the types of chemical reactions.
- Understand the relationship between the structure of matter and its properties.
- Understand how the structure of the atom dictates the periodic relationships of matter.
- Understand the principles that affect the rate of a chemical reaction.
- Understand how thermodynamics affects the plausibility of a chemical or physical process.
- Understand how intermolecular forces affect the physical properties and characteristics of liquids and solids.
- Understand how to mathematically describe chemical principles.
- Evaluate the differences in gases, liquids, and solids from the viewpoint of Kinetic Molecular Theory.
- Evaluate how the evaporation, vapor pressure and boiling point of liquids are determined by their structure.
- Determine the affect of pressure and volume on the phase of solids and liquids.
- Through laboratory experimentation, students will develop: 1) the ability to calculate and interpret results based on the data obtained, 2) an understanding of the mass and volume relationships of chemical systems, 3) an understanding of the dynamic nature of chemical equilibrium, 4) the qualitative and quantitative skills to describe the behaviors of solutions.

Instructional Strategies

Various instructional strategies will be utilized throughout the session in attempt to maximize the each student's learning experience. The following techniques will be used throughout the course: modeling, small group discussion, cooperative learning and use of prior knowledge.

Resources and Materials

- **Books**
 - *Chemistry: The Central Science*, Brown, T., LeMay, H., Bursten, B., Pearson Prentice Hall, 10th Ed. 2006, ISBN # 0-13-193719-7
 - Accompanying Solutions to Red Exercises ISBN # 0-13-146486-8
- **Materials**
 - Graphing Calculator
 - 3-ring binder with loose-leaf paper (for notes, handouts, quizzes and exams)
 - 3-ring binder (for graded labs)

- **Lab Dress Requirements**
 - Short sleeve shirt, long pants, closed-toed shoes with socks.

Student Assessment

- **Pre-Assessment**

A short AP Chemistry type exam will be administered.

- **CTD Grading Scale**

A+	100-97%	A	96-93%	A-	92-90%
B+	89-87%	B	86-83%	B-	82-80%
C+	79-77%	C	76-73%	C-	72-70%
D+	69-67%	D	66-63%	D-	62-60%
F	below 60%				

- **Breakdown of Final Grade**

Tests – 50%

Given the accelerated nature of this course, 1 – 2 chapters will be covered each day. There will be a test covering the previous 2-day’s material during the morning session of the test day.

Labs – 15%

Laboratory experiments will be conducted daily. For each laboratory experiment, a written report consisting of purpose, procedure, data, data analysis, error analysis, and conclusion is graded and returned to the student. The laboratory reports are collected into a portfolio (lab binder) for the students to show to the college of their choice for evaluation for possible college credit. Group collaboration and presentations are expected for selected laboratories. The labs will be due the following day. Lab reports will follow a formal format and will be hand written or typed. Details regarding this format will be elaborated upon during an initial class..

Homework – 15%

Homework will be checked, but not strictly graded. It is the responsibility of each student to do all assigned homework. Homework is meant to assist in learning outside the classroom.

Final Exam – 20%

A comprehensive exam will be administered on the last day of class. The exam used will be an AP Chemistry type exam.

- **Post-Assessment**

A short AP Chemistry type exam will be administered.

Schedule

Date	Topics	In-class Activities	Assignments/Assessments
Sun	Opening Day – Introduction Parent/Teacher Conferences Sign-up		Read Chapters 1 & 2

Date	Topics	In-class Activities	Assignments/Assessments
Mon	Chapter 1: Matter & Measurement Section 1.1-1.6 Chapter 2: Atoms, Molecules & Ions Section 2.1-2.8 Chapter 3: Stoichiometry Section 3.1-3.7	Lab: Density of Liquids and Solids	Chapter 1 Problems: 10, 12, 20, 26, 32, 38, 42, 48, 52 Chapter 2 Problems: 20, 24, 30, 44, 48, 54, 56, 60, 62, 64 Chapter 3 Problems: 12, 18, 20, 22(cde), 24(bcd), 34, 36, 42, 44, 50, 58, 60, 74, 76 Pretest: Monday evening with RTA
Tues	Chapter 4: Reactions in Aqueous Solution Section 4.1-4.6	Lab: Analysis of an Unknown Chloride	Chapter 4 Problems: 16, 20, 22, 26, 30, 38, 40, 50, 56, 62, 64, 68, 70, 80, 84, 88
Wed	Chapter 10: Gases Section 10.1-10.9	Test: Ch. 1-4 Lab: Al/Zn Alloy	Chapter 10 Problems: 12, 18, 24, 26, 34, 36, 44, 48, 52, 64, 76, 78
Thur	Chapter 5: Thermochemistry Section 5.1-5.7	Test: Ch. 10 Lab: Thermodynamics – Enthalpy of Reaction and Hess's Law	Chapter 5 Problems: 36, 38, 46, 48, 52, 54, 56, 60, 62, 64, 70, 74, 76
Fri	Chapter 6: Electronic Structure of Atoms Section 6.1-6.9 Chapter 7: Periodic Properties of the Elements Section 7.1-7.6	Test: Ch. 5 Lab: Finding the Ratio of Moles of Reactants in a Chemical Reaction	Chapter 6 Problems: 16, 18, 24, 28, 36, 50, 54, 64, 74 Chapter 7 Problems: 14, 22, 24, 26, 30, 34, 42, 44, 48, 50
Mon	Chapter 8: Covalent Bonding Section 8.1-8.8 Chapter 9: Molecular Geometric and Bonding Theories Section 9.1-9.6	Test: Ch. 6-7 Lab: Molecular Models	Chapter 8 Problems: 12, 16, 30, 34, 40, 46, 52, 62, 66, 68, 72 Chapter 9 Problems: 22, 26, 30, 32, 36, 38, 46, 54, 82
Tues	Chapter 11: Intermolecular Forces, Liquids and Solids Section 11.1-11.7 (excluding units cells pp. 466-470), 11.8	Test: Ch. 8-9 Lab: Intermolecular Forces Lab	Chapter 11 Problems: 12, 16, 22, 24, 26, 34, 38, 40, 50, 54, 72, 78
Wed	Chapter 13: Properties of Solutions Section 13.1-13.5	Test: Ch. 11 Lab: Freezing Point Depression Lab	Chapter 13 Problems: 22, 28, 32, 36, 38, 42, 46, 58, 62, 64, 68, 72
Thur	Chapter 14: Chemical Kinetics Section 14.1-14.7	Test: Ch. 13 Lab: Kinetics of a Reaction	Chapter 14 Problems: 10, 14, 18, 22, 24, 28, 30, 38, 40, 48, 50, 54, 62, 66, 94
Fri	Chapter 15: Chemical Equilibrium Section 15.1-15.7	Test: Ch. 14 Lab: Equilibrium Lab	Chapter 15 Problems: 2, 10, 14, 16, 20, 22, 28, 30, 34, 38, 42, 44, 46, 50, 52, 54, 64

Date	Topics	In-class Activities	Assignments/Assessments
Mon	Chapter 16: Acid - Base Equilibria Section 16.1-16.11	Test: Ch. 15 Lab: Titration of a Weak Acid	Chapter 16 Problems: 16, 18, 20, 26, 30, 36, 38, 44, 48, 54, 56, 60, 64, 74, 76, 78, 82, 86, 88, 94, 102
Tues	Chapter 17: Additional Aspects of Aqueous Equilibria Section 17.1-17.6	Test: Ch. 16 Lab: Determination of K_{sp} of an Ionic Compd.	Chapter 17 Problems: 12, 14, 20, 24, 28, 30, 38, 40, 44, 50, 52, 60, 78
Wed	Chapter 19: Chemical Thermodynamics Section 19.1-19.7	Test: Ch. 17 Lab: Hydrolysis Lab	Chapter 19 Problem: 8, 22, 30, 38, 42, 44, 48, 52, 54, 56, 60, 72, 76, 78
Thur	Chapter 20: Electrochemistry Section 20.1-20.6	Test: Ch. 19 Review!!!	Chapter 20 Problems: 14, 18, 20, 24, 32, 34, 36, 40, 46, 48, 50, 52, 60, 62, 66
Fri		Final Exam: 9am – 12pm Conferences: 1pm - 4 pm	

CTD Statement on Third-Party Web Sites

Instructors are required to thoroughly review any third-party web sites they intend to use in their courses for inappropriate content. However, because web content continuously changes, CTD disclaims any responsibility for any of the content contained on third-party web sites used in course materials. If you become aware of anything that may be inappropriate, please notify CTD staff immediately.