

El Paso Community College

Syllabus

Part II

Official Course Description

SUBJECT AREA	<u>Chemistry</u>
COURSE RUBRIC AND NUMBER	<u>CHEM 1312</u>
COURSE TITLE	<u>General Chemistry II</u>
COURSE CREDIT HOURS	<u>3 3 0</u>
	Credits Lec Lab

I. Catalog Description

Continues CHEM 1311. Includes topics in intermolecular forces, concentration units of solution, chemical kinetics, gaseous equilibria, free energy changes in reactions and the equilibrium constant, oxidation-reduction, electrochemical cells and structure, and acid-base equilibria. **Prerequisite: CHEM 1311 and CHEM 1111 with a "C" or better. Corequisite: CHEM 1112. (3:0).**

II. Course Objectives

Upon satisfactory completion of this course, the student will be able to:

- A. Engage in **critical thinking skills**, creative thinking, innovation and inquiry; demonstrate analysis, evaluation, and synthesis of information.
- B. Demonstrate effective written, oral, and/or visual **communication skills**.
- C. Demonstrate **teamwork skills** including the ability to consider different points of view, work effectively with others to support a shared purpose or goal, and integrate peer responses and instructor suggestions into the revision process.
- D. Students will demonstrate the ability to formulate an inquiry and then identify and follow an investigative process using **empirical and/or qualitative/quantitative skills** and reasoning to satisfy the inquiry.
- E. Describe the characteristic properties of solids, liquids and gases.
- F. Describe the different types of intermolecular attractive forces. Using a phase diagram, predict what changes a substance will undergo as it is heated or cooled.
- G. Calculate concentrations in units of molarity, mass percent, and mole fraction.
- H. Solve problems involving boiling point, freezing point, osmotic pressure and vapor pressure.
- I. Describe all the term in the rate equation, and define the order of reaction. Determine for the first and second-order reactions. Apply the rate law equation and graphs to determine whether a reaction is a first order or second order. Derive the rate law for a reaction from its proposed mechanism.
- J. What are the factors affecting equilibrium. Determine whether a reaction is at equilibrium or not, predict the directions in which a net reaction will occur.
- K. Define Acids and Bases. Determine the pH of strong acids, strong bases, weak acids, and weak bases. Describe a conjugate acid-base pair. Predict whether a salt solution will be acidic, basic or neutral.

- L. Determine the pH of buffer solutions. Predict a buffer solution as acidic or basic. Describe how to prepare a buffer solution and choose the best indicator for a particular acid-base titration. Predict whether a precipitate will form when two solutions are mixed.
- M. The second law Thermodynamic. Free energy and equilibrium. Relating Enthalpy, Entropy and Gibbs free energy to the spontaneity processes.
- N. Electrochemical cells. Galvanic cell and electrolytic cell. Calculate the standard electrode potentials.

III. THECB Learning Outcomes (ACGM)

Upon successful completion of this course, students will:

1. State the characteristics of liquids and solids, including phase diagrams and spectrometry.
2. Articulate the importance of intermolecular interactions and predict trends in physical properties.
3. Identify the characteristics of acids, bases, and salts, and solve problems based on their quantitative relationships.
4. Identify and balance oxidation-reduction equations, and solve redox titration problems.
5. Determine the rate of a reaction and its dependence on concentration, time, and temperature.
6. Apply the principles of equilibrium to aqueous systems using Le-Chatelier's Principle to predict the effects of concentration, pressure, and temperature changes on equilibrium mixtures.
7. Analyze and perform calculations with the thermodynamic functions, enthalpy, entropy, and free energy.
8. Discuss the construction and operation of galvanic and electrolytic electrochemical cells, and determine standard and non-standard cell potentials.
9. Define nuclear decay processes.
10. Describe basic principles of organic chemistry and descriptive inorganic chemistry.

IV. Evaluation

- A. Pre-assessment
Instructors should check each student's prerequisites the first week of class; those who do not qualify should be sent back to Admissions.
- B. Challenge Exam
Students who wish to challenge the course should contact the Testing Center and the Division Dean. Challenges must be accomplished before the census cut-off date. Students who previously have received a W or a letter grade for the course are not eligible to challenge the course.
- C. Post-assessment
 1. The instructor will maintain a continuous record of each student's progress on an institutionally approved grade sheet or computerized substitute. All instructors must keep records in such a way that information would be clear to a second party having to check grade computation in special cases. An explanatory legend should be provided on the grade sheet.
 2. The evaluation of the exams should be in an objective and reproducible manner. In addition to reading assignments, the instructor may require quizzes and exercises on the subject material.

It is essential that students commit themselves to the assignments throughout the semester.

Number and Types of Examinations: The course will include a minimum of four major written examinations and one final examination.

Reading assignments of textbook or library materials may vary in length, depending on the nature of the subject, and may be part of the examinations.

The following approaches may be involved; however, instructors should stress the possible overlap of these strategies.

1. Process analysis
2. Critical thinking
3. Comparison/contrast
4. Classification
5. Definition
6. Description
7. Causal analysis
8. Analogy
9. Problem/solution

D. Final Examination

A final examination is required in all Chemistry 1312 classes. The exam should consist of all material covered in class during the semester in the scheduled two-hour final examination period. The final essay should reflect a satisfactory mastery of the course objectives including the use of appropriate strategies of problem solving..

E. Grading Percentages

Grade percentages for determining the course grade may be devised by the individual instructor, but the grade for the final exam should be averaged as 200% of the regular exam grades.

F. Remediation

There will be no remediation. Since the lowest exam grade is dropped, there are no make-up examinations.

G. Grading Scale:

A = 90 - 100	I = Incomplete
B = 80 - 89	W = Withdrew or withdrawn
C = 70 - 79	
D = 60 - 69	
F = below 60	

V. Disability Statement (Americans with/Disabilities Act [ADA])

EPCC offers a variety of services to persons with documented sensory, mental, physical, or temporary disabling conditions to promote success in classes. If you have a disability and believe you may need services, you are encouraged to contact the Center for Students with Disabilities to discuss your needs with a counselor. All discussions and documentation are kept confidential. Offices located: VV Rm C-112 (831-2426); TM Rm 1400 (831-5808); RG Rm B-201 (831-4198); NWC Rm M-54 (831-8815); and MDP Rm A-125 (831-7024)

VI. 6 Drop Rule

Students who began attending Texas public institutions of higher education for the first time during the Fall 2007 semester or later are subject to a 6-Drop limit for all undergraduate classes. Developmental, ESL, Dual Credit and Early College High School classes are exempt from this rule. All students should consult with their instructor before dropping a class. Academic assistance is available. Students are encouraged to see Counseling Services if dropping because exemptions may apply. Refer to the EPCC catalog and website for additional information.