

Department.: Chemistry

Course No: CHEM 125Q

Title: Fundamentals of General Chemistry

Credits: 4

Contact: CECILE HURLEY

Content Area: CA 3 Science and Technology

WQ: Q

Catalog Copy: 125Q. Fundamentals of General Chemistry II. Either semester. Three credits. Prerequisite: CHEM 124Q. Two class periods and one 3-hour laboratory period. Open by consent of instructor for only 1 credit to students who have passed CHEM 122 with high standing or who have passed CHEM 127Q, 129Q or 137Q. Not open to students who have passed CHEM 128Q, 130Q, or 138Q. Follows CHEM124Q. Topics include the properties of aqueous solutions and chemical equilibria.

Course Information:

A) The goal of this course is to follow-up and build on the principles learned in Chem 124Q.

B) The course consists of 2 in class exams, a final, weekly homework assignments and quizzes an hour of group work (weekly) and a 3-hour lab every other week and a 3-hour period of problem solving every other week. All problems in homework, group work, quizzes and exams require calculations, graph creation and interpretation.

C) The main theme is equilibria, in the different phases of matter, in gases, in acids and bases, in buffers. Thermochemistry is also discussed.

Meets Goals of Gen Ed: The students acquire intellectual breadth and versatility. They are exposed to the chemical principles that govern much of this technological age. They are required to be disciplined, precise and accurate thinkers. They are trained to translate language into symbolic equations.

CA3 Criteria: The students continue to explore the foundations of chemistry. Much of the material explains equilibria which touches on metabolic processes, buffers, ice packs and cold packs, etc. The material explains the chemical processes behind these phenomena.

Q Criteria: Most homework, quiz and exam problems require numerical answers. The level of the problems vary throughout the course. On one end are plug and chug questions where numbers are plugged into a formula to get an answer. The next level requires algebraic manipulations of a formula to solve for a variable in terms of other variables and interpret its

quantitative significance. At the other end, some problems require setting up and solving two simultaneous equations or deducing a function from the graph obtained by plotting experimental data. Most of the principles explained and tested for use formulas and functions, linear and quadratic equations. Graphs have to be interpreted and the method of successive approximations is used for occasional cubic equations. The students are also expected to have a working knowledge of powers, roots and logarithms to solve problems. The students (after solving algebraically for numerical answers) are asked to create graphs, draw conclusions, make comparisons and express their results in a precise and accurate manner with an emphasis on scientific notation and significant figures.

Laboratory Courses Description: Lab courses are conducted in a 3 hour block every other week. The students individually determine either a physical property (e.g. density) or a chemical property (how acidic is the compound?) of an unknown. This is done by learning specific chemical techniques, followed by a detailed process of chemical analysis and concluded by calculations done on the data acquired.

Role of Grad Students: The graduate students assisting in this course lead a collaborative learning session (3 hours every other week) and administer 10 min. quiz which has been approved by the course coordinator. They meet with the course coordinator weekly for 15 hrs. to go over the lab experiment, homework assignment solutions and the group learning worksheet. The graduate students grade lab reports according to a grading scheme given to them. They do not assign grades. They are supervised by the course coordinator - Cecile N. Hurley.