

REGULAR COURSE SYLLABUS

School of: Letters, Arts & Sciences

Department: Chemistry

CIP Code: 40.0506

Prefix & Course Number: CHE 3200

Crosslisted With*: _____

Course Title: Survey of Physical Chemistry Laboratory

Check All That Apply: Required for Major: Required for Minor: _____ Specified Elective: _____

Required for Concentration: Elective: _____ Service Course: _____

Credit Hours: 1 (0+3)

Total Contact Hours per semester (assuming 15-16 week semester):

Lecture _____ Lab 45 Internship _____ Practicum _____ Other (please specify type and hours): _____

Schedule Type(s): A Grading Mode(s): L

Variable Topics Courses (list restrictions, including the maximum number of hours that can be earned**):

** NOTE: This information must be included in the course description.

Restrictions (Variable Topics Course): None

Prerequisite(s): CHE 3000, MTH 1410; PHY 2010 or PHY 2311

Corequisite(s): None

Prerequisite(s) or Corequisite(s): _____

Banner Enforced:

Prerequisite(s):

Corequisite(s):

Prerequisite(s) or Corequisite(s):

Catalog Course Description:

This course covers laboratory explorations of key concepts in thermodynamics, equilibrium, kinetics, and gas laws. Technical writing is emphasized, students are required to use a personal computer to complete lab reports.

APPROVED:

Charles A. Tindall

Department Chair OR Program Director

11/8/05

Date

Dean OR Associate Dean

Ronda S. Curran

11/18/05

Date

Associate VP, Academic Affairs

2/6/06

Date

Prefix and Course Number: CHE 3200

Required Reading and Other Materials will be equivalent to:

Experiments in Physical Chemistry, Garland, Nibler, Shoemaker, McGraw Hill 2003.

Specific, Measurable Student Behavioral Learning Objectives:

Upon completion of this course the student should be able to:

1. Set up and use a simple gas law apparatus.
2. a. Prepare a sample for combustion in a bomb calorimeter. Assemble the bomb calorimeter, "Charge" the bomb.
b. Measure the heat of reaction by isothermal and adiabatic calorimetry.
3. Determine the boiling points of a volatile liquid at various applied pressures.
4. Experimentally determine a rate law, rate constant, and energy of activation for a chemical reaction.
5. Prepare and interpret graphs of experimental data using an appropriate computer program.
6. Compare experimental techniques as to efficacy and accuracy.
7. Prepare a cogent lab report and constructively critique the report of a peer.

Detailed Outline of Course Content (Major Topics and Subtopics) or Outline of Field Experience/Internship (experience, responsibilities and supervision) (format: I, A, 1, a, etc.):

- I. Confirming Boyle's Law and Determining the Ideal Gas Constant
- II. Peer Review
- III. Experimental Determination of Thermodynamic Quantities
 - a. Bomb Calorimetry
 - b. Isothermal Calorimetry
- IV. Equilibria
 - a. Phase Equilibria - Vapor Pressure of Pure Liquid
 - b. Acid Dissociation Constants/Thermodynamic Quantities and Structure
- V. Kinetics - Determination of Specific Rate Law.

Evaluation of Student Performance (format: 1, a, i, ii, etc.):

Students are evaluated on the basis of 5 formal lab reports, participation in peer review and group meeting, and work ethic (attendance, preparation for lab, adequate documentation of lab work, adherence to lab safety guidelines).