

METROPOLITAN STATE COLLEGE of DENVER
Office of Academic Affairs

REGULAR COURSE SYLLABUS

School of: Letters, Arts & Sciences

Department: Chemistry

CIP Code: 40.0506

Prefix & Course Number: CHE 3290

Crosslisted With*: _____

Course Title: Physical Chemistry Laboratory II

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

Required for Concentration: _____ Elective: _____ Service Course: _____

Credit Hours: 2 (0+4)

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

Lecture _____ Lab 60 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 3280

Corequisite(s): CHE 3260

Prerequisite(s) or Corequisite(s): _____

Banner Enforced:

Prerequisite(s):

Corequisite(s):

Prerequisite(s) or Corequisite(s):

Catalog Course Description:

This course provides a laboratory study of the basic principles of quantum mechanics and spectroscopy. Technical report writing, data handling and literature search will be emphasized.

APPROVED: Charles B. Tindall

Department Chair OR Program Director

11/8/05

Date

Dal Samdy

Dean OR Associate Dean

11/18/05

Date

Linda S. Curran

2/6/06

Associate VP, Academic Affairs

Date

*If crosslisted, attach completed Course Crosslisting Agreement Form

Prefix and Course Number: CHE 3290

Required Reading and Other Materials will be equivalent to:

Experiments in Physical Chemistry, D.P. Shoemaker, C.W., Garland, and J.W. Nibler; 7th Edition, McGraw Hill Publishing, 2003

Specific, *Measurable* Student Behavioral Learning Objectives:

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

1. Experimentally measure and interpret
 - a. Planck's constant
 - b. electronic spectra of atoms
 - c. electronic spectra of molecules
 - d. vibration-rotation spectra of diatomic molecules
2. Theoretically predict
 - a. energy levels of atoms
 - b. wavelength of light absorbed by atoms and molecules
3. Explain the theory of operation a variety of Instrumentation
 - a. UV-visible spectrometers
 - b. FT-IR spectrometers
 - c. visible spectrometers
4. Use additional computational techniques
5. Conduct an advanced literature search

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. Laboratory Experiments
 - a. determination of Planck's constant
 - b. spectra of conjugated dyes
 - c. atomic spectra
 - d. vibration-rotation spectra of HCl/DCI
- II. Data Analysis
 - a. test theories from quantum mechanics
 - b. use of computers for data collection
 - c. use of computers for data processing
- III. Literature Search

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

Students will have to prepare a formal lab report for each experiment with a full error analysis. A comprehensive literature search will be included in at least one laboratory project. Students will have to use computers for data processing using commercial software and programs written by the student. The final grade determination will be based on the lab reports and the performance in the laboratory.