Graduate Courses – Spring 2011 - Chemistry

534  Joel Bowman        TT  10:00-11:15
**Advanced Physical Chemistry IV**
Molecular Spectroscopy. The purpose of this course is to give a rigorous introduction to the principles that govern the interaction of molecules with light and other electromagnetic radiation. The topics covered will be useful both to experimentalists and theorists.

552  Brian Dyer        MW  9:00-10:15
**Advanced Inorganic Chemistry II: Physical Methods**
Content: The central goal of bioinorganic chemistry is to elucidate the structures and reactivities of metal centers within biomolecules. The physical methods used to explore the nature of the metal environment within a biomolecule have been critical to progress in this field. This course will explore the fundamentals of physical methods and their specific applications to problems in bioinorganic chemistry, including electronic absorbance and emission, infrared, Raman, CD, MCD, EPR and X-Ray absorption spectroscopies. Students will be evaluated on the basis of problem sets, examinations and a class presentation.
Text: Physical Methods in Bioinorganic Chemistry (Que), University Science Books; in addition, suggested background texts include: Spectroscopic Methods in Bioinorganic Chemistry (Solomon) and Biological Inorganic Chemistry (Bertini, Gray, Stiefel, Valentine).

523  Frank McDonald        TT  11:30-12:45
**Advanced Organic Chemistry III**
This course completes the four semester graduate organic chemistry core courses, which also include Chem 521, 522 and 524. The material covered in this course requires a thorough knowledge of physical organic chemistry, basic structural and mechanistic theory, organic reactivity, and stereochemistry. The course focuses on modern concepts and strategies for the synthesis of a broad range of organic compounds including natural and non-natural products.
Prerequisite: Successful completion of Chem 522 or Chem 521 is required.

524  Lanny Liebeskind        TT  8:30-9:45
**Spectroscopy in Organic Chemistry**
Chemistry 524 is a problem-solving course in spectroscopic and spectrometric techniques used for the structural characterization of organic compounds. Methods to be studied include nuclear magnetic resonance spectroscopy (1H, 13C, 2D), infrared spectroscopy, ultraviolet / visible spectroscopy, and mass spectrometry. A major part of the course will be focused on problem-solving techniques, including the integrated application of spectroscopic and spectrometry techniques to determine structures of polyfunctionalized organic compounds.
Prerequisites: Chem 221 and 222 or equivalent (one full year of introductory organic chemistry); Chem 521 is highly recommended.

553  Craig Hill        MWF  11:45-12:35
**Advanced Inorganic Chemistry III: Kinetics and Mechanism**
This course focuses on the mechanisms of inorganic and organometallic reactions. The course
provides both intellectual background and practical methods required for effective research in this area and in condensed phase reaction mechanisms in general. The methods to be covered include kinetics, product distribution, pertinent spectroscopic studies and the use of modern software for data processing. The subjects to be covered include determination of association stoichiometry and binding constants, rate laws, activation parameters and other features of complex mechanisms. The convergence of experimental and theoretical mechanisms and pitfalls in the study of reactions will be addressed.

575 Vince Conticello TT 1:00-2:15
Content: The course involves the application of physical chemical approaches to study biological macromolecules in solution. Hydrodynamic (thermodynamic), spectroscopic, and kinetic approaches to understand biological structure and function of biological macromolecules will be covered in the course.
Suggested Reference Texts (on reserve in Chemistry library):
Tanford, C. “Physical Chemistry of Macromolecules”, J. Wiley & Sons, 1961
Campbell & Dwek “Biological Spectroscopy” Benjamin/Cummings Publ. Co. 1984
PREREQUISITES: Undergraduate Physical Chemistry (required); Undergraduate Biochemistry (Recommended)
GRADES: Are compiled from the results of two take-home exams, class participation on take home problems sets and the final exam is a student presentation on a topic related to the course materials.

722 Justin Gallivan MWF 12:50-1:55
Special topics in biomolecular chemistry literature – Molecular Evolution

752 Karl Hagen TT 2:30-3:45
The objective of the course is to prepare students obtain crystal structures to support their research and to critically evaluate crystal structures (either their own as determined in house or published structures). Theory and practice of crystal design growth (ie Crystal Engineering). The course will cover practical and theoretical aspects of X-ray crystallography using the diffractometer and computer programs available in the Chemistry Department. Emphasis will be placed on the structure determination of small molecules by single crystal diffraction, but powder diffraction will also be covered. Students will carry out the structure determination of molecules from different research groups. Final reports in a format suitable for submission to a scientific journal will be expected.
Software: SHELXTL, SHELX, Olex2, CrystalMaker, CrystalDiffract, Single Crystal, WinGX, Platon, EnCIFer, PublCIF.
597  Donna Hudson  TBA
Directed Study Library Course
This course is required for all first year graduate students and BS/MS students in the Chemistry Department. It is designed to provide the new students with the information and skills needed to function efficiently and effectively in the use of library services during the pursuit of their graduate program of study and research at Emory. It will be offered as a series of seminars at the beginning of Fall and Spring Semesters. Students will receive one credit for the course; a grade of pass/fail will be issued at the end of Spring Semester.

606  Arri Eisen  Jan. 10-11  Ethics Bldg
Ethics in Science

599  James Kindt  TBA
Thesis Research

791  Stefan Lutz  M 4:15-5:15
Analytical/Biomolecular Seminar

792  Cora MacBeth  TU 4:00-5:15
Inorganic Seminar

793  Simon Blakey  W 2:30-3:45
Organic Seminar

794  Joel Bowman  M 3:00-4:15
Physical Seminar

799  James Kindt  TBA
Advanced Thesis Research