

Course Catalog - Spring 2006

Biophysics

401 **Introduction to Biophysics** Credit: 3 hours.

Review of membrane and cell biophysics designed to introduce the theoretical and mathematical bases of bioelectricity, photobiology and biomolecular motors. Prerequisite: One year each of college-level mathematics and physics; one year each of college level biology and chemistry recommended.

417 **Modeling Neural Systems** Credit: 4 hours.

Same as BIOE 417, MCB 417, and NEUR 427. See MCB 417.

419 **Brain, Behavior & Info Process** Credit: 3 hours.

Same as MCB 419, BIOE 419 and NEUR 419. See MCB 419.

420 **Molecular Biophysics** Credit: 3 hours.

Examines structure and function of biological macromolecules and supramolecular assemblies; methods for three-dimensional structure determination. Specific topics include: diffraction methods, protein structure and the molecular basis of enzyme catalysis, antibody structure and function, virus structure and assembly; membrane proteins, microtubules and other supramolecular assemblies, nucleic acid structure, protein-nucleic acid interactions. Same as MCB 425. Prerequisite: MCB 354; CHEM 440, or equivalent; or consent of instructor.

432 **Photosynthesis** Credit: 3 hours.

Comprehensive description of photosynthesis. Topics include: the photosynthetic membranes, light absorption, electron and proton transfer, photophosphorylation, water oxidation, RUBP carboxylase/oxygenase, photorespiration, whole plant photosynthesis, gas exchange and atmospheric interactions, and impacts of global environmental change. Same as CPSC 489, and IB 421. Prerequisite: IB 420, MCB 354, MCB 450, BIOP 401, or equivalent; or consent of instructor.

470 **Computational Chemical Biology** Credit: 3 or 4 hours.

Same as CHEM 470. See CHEM 470.

514 **Sensory Biophysics** Credit: 1 or 2 hours.

Advanced treatment of sensory systems which are approachable in detailed quantitative terms; lectures scheduled for four weeks during the first quarter of the spring term. Normally carries 1 hour credit; however, students may develop a particular topic introduced in the lectures into a term paper for an extra 1 hour credit. Students must consult the instructor before enrolling for 2 hours. Prerequisite: BIOP 401, MCB 401, or consent of instructor.

540 **Topics in Biophysical Chem** Credit: 4 hours.

Same as CHEM 576, and MCB 556. See CHEM 576.

541 **Macromolecular Modeling** Credit: 4 hours.

Principles and analysis of macromolecular structure, dynamics and interactions, and bioinformatics. Includes use of computers and graphics workstations to carry out modeling and simulations of proteins and nucleic acids. Prerequisite: Consent of instructor.

542 **Biomedical Magnetic Resonance** Credit: 3 hours.

Principles of magnetic resonance and its application to biology and medicine; includes discussion of magnetic resonance imaging and spectroscopy of living systems. Prerequisite: Introductory biology and physical chemistry.

546 **Bioenergetics** Credit: 2 hours.

Describes and analyzes the principles of biological energy transduction using diverse examples from prokaryotic and eukaryotic metabolism; includes fermentation, aerobic and anaerobic respiration, methanogenesis, and photosynthesis. Meets during the last half of the spring term. Same as MCB 546. Prerequisite: MCB 354 and CHEM 440, or equivalent; or consent of instructor.

550 *Biomolecular Physics* Credit: 4 hours.

Same as MCB 550, and PHYS 550. See PHYS 550.

581 *Lab Rotation I* Credit: 2 hours.

Laboratory research methods; familiarization of first-year graduate students with experimental methods used in research in Biophysics and Computational Biology. Required of all first-year students majoring in Biophysics and Computational Biology. First five weeks of fall term. Prerequisite: First-year graduate status and consent of department; concurrent registration in BIOP 582 and BIOP 583.

582 *Lab Rotation II* Credit: 2 hours.

Laboratory research methods; familiarization of first-year graduate students with experimental methods used in research in Biophysics and Computational Biology. Required of all first-year students in Biophysics and Computational Biology. Second five weeks of fall term. Prerequisite: First-year graduate status and consent of department; concurrent registration in BIOP 581 and BIOP 583.

583 *Lab Rotation III* Credit: 2 hours.

Laboratory research methods; familiarization of first-year graduate students with experimental methods used in research in Biophysics and Computational Biology. Required of all first-year students majoring in Biophysics and Computational Biology. Last five weeks of fall term. Prerequisite: First-year graduate status and consent of department; concurrent registration in BIOP 581 and BIOP 582.

586 *Special Topics in Biophysics* Credit: 1 to 4 hours.

Advanced course/tutorials on topics of interest in biophysics, such as electrophysiology, radiation biology, bioenergetics, protein structure, or the physics of muscular contraction Prerequisite: Consent of instructor.

590 *Individual Topics* Credit: 2 to 10 hours.

For graduate students wishing to study individual problems or topics not assigned in other courses. Prerequisite: Consent of department.

595 *Biophysics Seminars* Credit: 1 to 2 hours.

Survey of literature in one area of biophysics, with special emphasis on student reports. Approved for both letter and S/U grading. Prerequisite: Graduate standing in Biophysics and Computational Biology.

599 *Thesis Research* Credit: 0 to 16 hours.

Research may be conducted in any area under investigation in a faculty laboratory, subject to the approval of the faculty member concerned and the department in which the research is to be done. Approved for S/U grading only.