

Course Catalog - Fall 2004

Biophysics

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

(BIOPH 301) 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 **Computational Neurobiol Method** Credit: 4 hours.

(BIOPH 317) Same as BIOE 417, MCB 417, and NEUR 427. See MCB 417.

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

(BIOPH 320) 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.

(BIOPH 332) 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.

(BIOPH 414) 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.

(BIOPH 440) Same as CHEM 576, and MCB 556. See CHEM 576.

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

(BIOPH 401) 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.

(BIOPH 442) 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.

(BIOPH 446) 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.

(BIOPH 450) Same as MCB 550, and PHYS 550. See PHYS 550.

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

(BIOPH 410) 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.

(BIOPH 490) 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.

(BIOPH 411) Survey of literature in one area of biophysics, with special emphasis on student reports. Approved for both letter and S/U grading. May be repeated for a total of 4 hours. Prerequisite: Graduate standing in Biophysics and Computational Biology.

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

(BIOPH 499) 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.