2014 SPRING COURSES  *Courses are appropriate for first year BBSP students.

*632 ADVANCED MOLECULAR BIOLOGY II (BIOL 632, GNET 632, MCRO 632, PHCO 632) (3). Prerequisites for undergraduates, at least one undergraduate course in both biochemistry and genetics. The purpose of this course is to provide historical, basic and current information about the flow and regulation of genetic information from DNA to RNA in a variety of biological stems. Spring. Baldwin (course director), Marzluff, Strahl.

*652 MACROMOLECULAR EQUILIBRIA (1.5). Prerequisites, CHEM 430 and two semesters of physical chemistry or permission of the instructor. Stability of macromolecules and their complexes with other molecules. Course intended primarily for graduate students. Spring. Dokholyan (course director).

653 MACROMOLECULAR SPECTROSCOPY (1). Prerequisites, CHEM 430 and two semesters of physical chemistry or permission of the instructor. Principles of UV, IR, Raman, fluorescence and spin resonance spectroscopies; applications to the study of macromolecules and membranes. Course intended primarily for graduate students. Spring. Carter (course director).

*655 CASE STUDIES IN STRUCTURAL MOLECULAR BIOLOGY (3). Prerequisite, CHEM 430 or equivalent. Principles of macromolecular structure and function with emphasis on proteins, molecular assemblies, enzyme mechanisms and ATP enzymology. Spring. Carter (course director).

*662 MACROMOLECULAR INTERACTIONS (1). Prerequisites, BIOC 650–653 or permission of the instructor. Theory and practice of biophysical methods used for macromolecular characterization, and for exploring interactions between macromolecules and their ligands. Techniques include surface plasmon resonance, analytical ultracentrifugation, calorimetry, and light scattering. Spring. Tripathy (course director).

*663A MACROMOLECULAR NMR (1). Prerequisites, BIOC 650–653 or permission of the instructor. Principles and practice of nuclear magnetic resonance (NMR) spectroscopy as applied to small and biological molecules in solution. Concepts for understanding two-dimensional NMR are introduced for applications in biological macromolecular structure and dynamics. Course intended primarily for graduate students. Spring. Campbell (course director), Lee

663B MACROMOLECULAR NMR PRACTICE (1). Prerequisite, BIOC 653 or permission of the course director. Lab section for BIOC 663A. Course intended primarily for graduate students. Spring. Campbell (course director), TerHorst, Lee

*665 ADVANCED NMR (2). Prerequisite, BIOC 663A/ CHEM 734 and associated NMR lab (BIOC 663B/ CHEM 734 or permission of the course director. Consists of both lecture and lab format. The objectives of this course are to introduce students to advanced topics in macromolecular NMR spectroscopy. Topics include understanding fundamental concepts associated with two dimensional double resonance spectroscopy as well as triple resonance 3D NMR spectroscopy (understanding pulse sequences, setting up experiments on the spectrometer, processing data and assigning resonances on a small rotein). Spring, (odd numbered years). Spring. Campbell (course director), Lee, and Young


*667 MACROMOLECULAR CRYSTALLOGRAPHIC METHODS (2). Prerequisite, BIOC 666 or permission of course director. A combined lecture/laboratory workshop for serious students of protein crystallography. Course intended primarily for graduate students. Spring (odd-numbered years). Collins (course director), Redinbo.
*670 STRUCTURAL BIOINFORMATICS (1). Prerequisites, none. A lecture course introducing computational methods for protein structure prediction, docking and design. Basic principles of protein structure, stability and folding are also reviewed. Spring, Kuhlman

*673 PROTEOMICS, PROTEIN IDENTIFICATION AND CHARACTERIZATION BY MASS SPECTROMETRY (1) Prerequisites, BIOC 650-653 or one semester of physical chemistry or permission of the instructor. A lecture module that introduces students to the basics of mass spectrometry as applied to protein science on the context of systems investigation of biological processes/pathways. Course intended primarily for graduate students. Spring, Chen.

*674 ION CHANNELS (1) Membrane transport. Prerequisite for undergraduates, at least one undergraduate course in biochemistry. A 6 week lecture model that will provide a comprehensive introduction to the structure and function of membrane transport systems and their cellular function. Spring, every other year. Meissner

*703 TEACHING IN BIOCHEMISTRY (1) Permission required of course director. For first year BBSP students or 2nd year Biochemistry students who want to gain instruction and experience learning how to teach biochemistry. Students will gain experience leading small group session and may present a lecture to undergraduates. Spring, Toews

*704 SEMINARS IN BIOPHYSICS (2). Prerequisite, permission of the instructor. Students present seminars coordinated with the visiting lecturer series of the Program in Molecular and Cellular Biophysics. Spring, Lentz (course director), staff.

711 RESEARCH CONCEPTS IN BIOCHEMISTRY (2). Prerequisite, master’s candidate in biochemistry and biophysics. A series of lectures and exercises on formulating a research plan to attack a specific scientific problem, and on presenting the research plan in the form of a grant proposal. Spring, Dohlman (course director), Staff.

712 SCIENTIFIC WRITING (3). Prerequisite, doctoral candidate in biochemistry and biophysics. A course of lectures and workshops on the principles of clear scientific exposition with emphasis on the design and preparation of research grants. Spring, Dohlman (course director), Staff.

723A CELLULAR AND MOLECULAR NEUROBIOLOGY: POSTSYNAPTIC MECHANISMS-INTRACELLULAR SIGNALING (NBIO 723A, PHCO 723A, PHYI 723A) (2). Prerequisite, permission of course director. Explores biochemical signal transduction events following activation of neurotransmitter receptors including G-protein coupling, desensitization, signaling specificity, downstream effectors, calcium signaling and tyrosine kinases. Course meets for five weeks with six lecture hours per week. Spring, Neurobiology faculty.

723B CELLULAR AND MOLECULAR NEUROBIOLOGY: PRESYNAPTIC MECHANISMS AND SYNAPTIC PLASTICITY (NBIO 723B, PHCO 723B, PHYI 723B) (2). Prerequisite, permission of course director. Explores the mechanisms regulating the release of neurotransmitters from nerve terminals, including quantal release, vesicle and terminal membrane proteins, neurotransmitter transporters and plasticity of synaptic transmission. Course meets for five weeks with six lecture hours per week. Spring, Manis (course director), Staff.

*740-745 CONTEMPORARY TOPICS IN CELL SIGNALING (1). Prerequisites, students are expected to have had undergraduate courses in biochemistry and cell & molecular biology or to have acquired knowledge in those fields. Permission required of each module leader. Each module is taught in 5-week blocks and will investigate principles and mechanisms of signal transduction and cell proliferation control with an emphasis on in-depth discussion of current literature and unanswered questions in the field. Modules are team-taught as a combination of lectures and discussions with major themes repeating in alternate years (740-742 taught consecutively in odd-numbered years, and 743-745 in even-numbered years). Themes include protein kinases, GTPases, cell cycle control, signaling specificity and feedback (networks), tumor suppressors and oncogenes, signaling in development and stem cell biology etc. Spring, Faculty.

993 MASTER'S THESIS

994 DOCTORAL DISSERTATION