

Courses Offered – Fall 2009 – Department of Neurobiology & Behavior

BioNB 1250 Biology Seminar: Genetics of Mammalian Social Behavior PS#21505

1 credit. Prerequisites: first-year standing or permission of instructor. S-U grades only. B.R. Johnson and R. Calvo.

A first-year seminar designed for students with Biology AP credit or a strong interest in research. Students will interact with faculty while learning to read and evaluate scientific publications on current biological topics. Multiple topics and sections will be offered each semester.

BioNB 2210 Introduction to Behavior

PS#15141 (3 cr Lec 001);

PS#15147 (4 cr Dis 201); auto enrolls you in Lec 002;

PS#15149(5 cr Dis 202, WIM section*); auto enrolls you in Lec 003 (*no pre-enroll for this section)

3, 4, or 5 credits; 4 credits with one disc per week; 5 credits with two disc per week and participation in Writing in the Majors program; 4- or 5-credit option required of students in neurobiology and behavior program of study. Limited to 15 students per 4-credit disc. Priority given to students studying neurobiology and behavior. Limited to 12 students in 5-credit option (students may not preregister for 5-credit option; interested students complete application form on first day of class). Not open to freshmen. Prerequisites: one year introductory biology for majors. May be taken independently of BIONB 2220. S-U or letter grades. M W F 12:20; disc TBA. K. L. Shaw and staff. General introduction to the field of animal behavior. Topics include evolution and behavior, behavioral ecology, sociobiology, chemical ecology, communication, orientation and navigation, and hormonal mechanisms of behavior.

BioNB 3240 Biopsychology Laboratory

PS#16009

4 credits. Limited to 20 students. Prerequisites: junior or senior standing; PSYCH 2230 or BIONB 2210 or 2220, and permission of instructor. T R 1:25-4:25. Letter grades only. T. J. DeVoogd. For description, see PSYCH 3240.

BioNB 3920 Drugs and the Brain

PS#25004 (Dis 201); auto enrolls you in Lec 001

4 credits. Limited to 90 students. Prerequisites: BIONB 2220 or equivalent course in neurobiology by permission of instructor. Recommended: knowledge of biochemistry. S-U or letter grades. T R 10:10-11:25; disc TBA. R. M. Harris-Warrick. Introduction to neuropharmacology, with an emphasis on the neural mechanisms of psychoactive drugs. Topics include a brief introduction to neuropharmacology and a discussion of the major neurotransmitter families. The rest of the course covers the major psychoactive drugs, including cocaine, heroin, psychedelics, marijuana, and alcohol, as well as pharmaceuticals for the treatment of anxiety, schizophrenia, and depression. Includes a term paper in the form of a grant proposal to study a current problem in neuropharmacology.

BioNB 3940 Circadian Rhythms PS#11415 (2 cr Lec 001); **PS#11419** (Lab); auto enrolls you in Lec 002

2 or 3 credits (for optional lab sec see PLPA 3941). Prerequisites: 2000-level biology course. S-U or letter grades. T R 10:10-11; additional lab R 1:25-4:25 for 3-cr option. K. Lee. For description, see PLPA 3940.

BioNB 4210 Effects of Aging on Sensory and Perceptual Systems

PS#15399

3 or 4 credits; 4-credit option involves term paper or relevant web site. Limited to 35 students. Prerequisites: introductory course in biology or psychology, plus second course in perception, neuroscience, cognitive science, or biopsychology. S-U or letter grades. T R 10:10-11:25. B. P. Halpern. For description, see PSYCH 4310.

BioNB 4220 Modeling Behavioral Evolution

PS#25006

4 credits. Limited to 25 students. Prerequisites: BIONB 2210, one year of calculus, course in probability or statistics, and permission of instructor; advanced undergraduates and graduate students. S-U or letter grades. T R 2:55-4:10; computer lab TBA. H. K. Reeve. Intensive lecture and computer lab course on modeling strategies and techniques in the study of behavioral evolution. Population-genetic (including quantitative-genetic), static optimization, dynamic programming, and game-theoretic methods are emphasized. These approaches are illustrated by application to problems in optimal foraging, sexual selection, sex ratio evolution, animal communication, and the evolution of cooperation and conflict within animal social groups. Students learn to critically assess recent evolutionary theories of animal behavior, as well as to develop their own testable models for biological systems of interest or to extend pre-existing models in novel directions.

BioNB 4240 Neuroethology

PS#25007

4 credits. Limited to 50 students. Prerequisites: BIONB 2220, or equivalent with permission of instructor. S-U or letter grades. M W F 10:10; disc TBA. C. D. Hopkins. Neuroethologists take a comparative and evolutionary approach to study the nervous system. They ask, how do brains of animals compare and how did they come about through the process of evolution? How are neural circuits adapted to species-typical behavior? What is the hope and interest in the study of a large diversity of animals, compared to a specialized look at just a few mammalian species? Can we hope to understand how animals with specialized behaviors have specialized nervous systems? What is the sensory world of a real animal and how does it vary from species to species? These and other questions derive this introductory survey of neuroethology, including exotic senses, amazing motor programs, surprising integration.

BioNB 4250 Molecular Neurophysiology PS#25009
3 credits. Limited to 20 students. Prerequisites: BIONB 2220 or permission of instructor. S-U or letter grades. T R 2:55-4:10. D. P. McCobb. Focuses on ion channels, the primary proteins generating cellular electrical signals in nerve cells and other excitable cells (e.g., muscle, heart, glands). Reviews the latest electrophysiological and molecular genetic experiments. Diversity of electrophysiology deriving from channel structure and expression patterns is considered in the contexts of behavior and behavioral plasticity (learning), neural development, and channel evolution. Format includes written and oral presentations, reviewing scientific literature in selected areas, and proposing new experiments.

BioNB 4700 Biophysical Methods PS#15519
3 credits. Prerequisites: solid knowledge of basic physics and mathematics through sophomore level. Recommended: knowledge of cellular biology. Letter grades only. M W 2:45-4:15. M. Lindau. For description, see AEP 4700.

BioNB 4930 Developmental Neurobiology PS#25010
3 credits. Limited to 20 students. Prerequisites: BIONB 2220 or permission of instructor. S-U or letter grades by permission of instructor. M W 2:55-4:10. R. Booker. Lectures covering the development of the nervous system, taking examples from both vertebrates and invertebrates. Emphasis is on cellular and molecular issues, that is, how do nerve cells differentiate both morphologically and biochemically? The role of cues such as hormones and developmental genes in neural development is discussed. Readings are taken from original journal articles.

BioNB 7210 Intro Graduate Survey in Neurobiology and Behavior PS#16271
2 credits. Requirement for graduate students majoring in neurobiology and behavior. Concurrent registration in BIONB 2210 and 2220 is required. S-U grades only. W 4:30-6:00. J. R. Fetcho and Staff. A year-long, graduate-level seminar with presentations from lecturers in BioNB 2210 and 2220. Discussions of current research in the area of neurobiology or behavior that have been presented in the lecture class. A lab project and/or a writing component each week could be assigned to ensure engagement with the material.

TOPICS COURSES

BioNB 4200, Dis 201 Your Inner Fish PS#15597
2 credits. Limited to 12 students. Prerequisites: BioNB 2220 or equivalent. S-U grades only. Wednesdays 1:25-2:15. W364 Mudd. A.H. Bass. Fishes are the largest and most ancient group of vertebrates. But what can fish teach us about ourselves? This course will explore the evolutionary origins of traits that humans with fishes and other vertebrates, focusing on neural mechanisms that underlie complex behaviors such as language and social recognition. Readings will be from the primary literature and from Neil Shubin's book, *Your Inner Fish* (2008, Pantheon Books).

BioNB 4200, Dis 202 Darwinian Medicine PS#25601
2 credits. Limited to 16 students. Prerequisites: BioNB 2210; written permission of instructor required (upper division students will be given preference). Letter grades only. Tuesdays 2:55-4:10. P.W. Sherman. This seminar will acquaint students with the exciting nascent field of Darwinian Medicine, a new approach to health and disease. Darwinian Medicine and Traditional Medicine are complementary, not alternatives: the former addresses ultimate (evolutionary) questions about bodily functions and the latter addresses proximate (mechanistic) questions about the same phenomena. This seminar will involve readings from the primary literature and discussions, highlighting such topics as genes in medicine, infectious diseases, fetal programming, immune system functioning, allergies, cancer, lactose malabsorption, morning sickness, senescence, cancer, menopause, and mental health. Students are required to write one paragraph weekly summarizing results and questions arising from the readings, and to co-lead at least one discussion.

BioNB 7200, Dis 201 Academic Skills for Biologists PS#25012
2 credits. Limited to 12 students. Prerequisites: Permission of instructor required or see T. Natoli (W363 Mudd); restricted to biology graduate students. S-U grades only. TBA. K. Adler. In-depth discussions of career choices for academic biologists to permit them to become the manager of their own career. Topics to be covered include writing resumés, choices of postdoctoral posts, applying for faculty positions, interviewing, where to publish, authorship, administering grants, dealing with editors, and tenure and promotion, among other topics. Discussions will be structured around the text "Survival Skills for Scientists," by Federico Rosei and Tudor Johnston (Imperial College Press, London, 2006). The last few sessions will be left open for discussion of topics chosen by the participants.

BioNB 7201 – Research Design in the Study of Animal Social Behavior (Lunch Bunch) PS#15599
BioNB 7202 – Current Topics in Neuroethology (NEJC) PS#15601
BioNB 7203 – Research Design in Cellular and Molecular Neurobiology (C&M JC) PS#15603

NOTE: Post-A NBB grads: GRAD 9001 - Graduate Dissertation Research - 799-RSC PS#16181