GRADUATE TOPICS COURSES (GRAD-ONLY) IN THE DEPARTMENT OF BIOLOGICAL SCIENCES

Graduate students are required to take 2 (MS) or 4 (Ph.D.) credits of graduate only topical courses. These 2-3 credit courses are generally seminar style and emphasize reading and discussing primary literature and synthesizing and presenting topical information. The following are two examples:

Title: Neuroethology  
Credits: 3  
Instructor: Dr. John Layne  
Prerequisites: Neurobiology, Sensory Physiology, or instructor permission  
Course description: This class has a strong emphasis on the discussion of primary literature and is geared towards developing critical thinking skills in graduate students. A combination of classic papers and recent literature are used to explore the neural mechanisms that underlie behavior. Topics include sensory-motor integration, central pattern generators, sensory filters, sensory-motor control, neuromodulation, spatial orientation and learning and memory. We will explore invertebrate and vertebrate systems, including many of the classic systems in neuroethology such as echolocation in bats and signaling in electric fish. In addition to the discussion of papers, biweekly sessions will start with a short lecture segment (~30 min) that will provide necessary background and place topics into a broad conceptual and historical framework. Each enrolled student will lead at least one literature discussion and will be responsible for producing a webpage or term paper on a specific topic chosen after consultation with the instructor.

Title: Molecular Mechanisms of Genome Stability  
Credits: 2  
Instructor: Dr. Dennis Grogan  
Prerequisites: Molecular Biology (BIOL8003) or equivalent, or instructor permission  
Course Description: The course will focus on the basic molecular mechanisms that preserve genetic (i.e., haplotype) integrity over multiple generations of cellular and organismal reproduction. The first half of the course will review broadly conserved mechanisms that repair DNA and control homologous recombination, replication fidelity, and environmental mutagenesis. More specialized, student-chosen topics will follow, which may address fitness costs and benefits of stability mechanisms, influence on the nature of molecular evolution, mechanisms that defend genomes against parasitic genetic elements, or related themes. Students’ ability to research, analyze, present, and critique the recent literature on these topics will be evaluated by a combination of discussions, presentations, exams, and writing assignments.