

BIOLOGY DEPARTMENT JUNIOR SEMINARS

2020-2021

FALL 2020

Bio 580 01: Genetic Analysis (Dr. Brad Hersh)**

A study of genetic approaches to the investigation of complex biological processes including animal development, behavior, and disease. We will consider model genetic systems such as the fruit fly, *Drosophila melanogaster*, and how these models can be used to analyze human genetic disorders. The laboratory involves experience with molecular biological methods, techniques of both forward and reverse genetics (e.g., mutagenesis, RNA interference), and molecular mapping of traits. One laboratory per week.

TTH 9:30-10:45, Steffee B.302
W 1:30-4:20, Steffee B.316

Bio 580 02: Signal Transduction (Dr. Margaret Nelson)**

An examination of the central role played by signal transduction pathways in the process of cellular differentiation. Particular emphasis is placed on evolutionarily conserved pathways involved in development in a wide range of organisms, including examples of signaling defects implicated in cancer and other human disorders. The laboratory includes experience in tissue culture, histochemical staining, and fluorescence imaging techniques. One laboratory per week. *Recommended: Bio 305, Bio 320, or Bio 325.*

MW 11-12:15, Steffee C.203
TH 1:30-4:20, Steffee B.212

Bio 580 03: Ecosystem Ecology (Dr. PJ Torres)

An exploration of how physical, chemical, and biological factors interact to regulate the structure and function of terrestrial and aquatic ecosystems. We will examine ecosystem processes and properties such as production, energy budgets and flow, nutrient cycling, decomposition, and disturbance. Students will navigate classic and modern ecological literature to build a holistic understanding of ecosystems and analyze how current global threats (e.g. biodiversity declines, increased levels of atmospheric CO₂) may impact them. The laboratory exercises are designed to introduce ecosystem-level field and laboratory techniques through short term research projects.

TTH 11-12:15, Steffee B.103
W 1:30-4:20, Steffee B.112

***This seminar is an appropriate choice for Neuroscience majors.**

****This seminar is an appropriate choice for Biochemistry majors.**

SPRING 2021

Bio 580 01: Neuroendocrinology* (Dr. Lauren Rudolph)

An examination of the interaction between hormones (e.g., estrogen, testosterone) and the nervous system using rodent models. Focusing on how the timing and mechanism of steroid action changes the structure and function of hormone-sensitive components of the nervous system involved in behaviors such as reproduction. Specifically investigates the rapid, membrane-initiated effects of testosterone on a spinal motor nucleus involved in male rat reproduction. Techniques include histology, immunohistochemistry, behavioral assays, and possibly other standard molecular neuroscience tools (e.g., ELISA, western blot).

TTH 11-12:15, Steffee B.302

T 1:30-4:20, Steffee B.316

Bio 580 02: Genome Stability and Cancer (Dr. Yee Mon Thu)**

An exploration of the way in which the genome is organized under physiological conditions and cellular mechanisms that actively maintain the stability of this organization. We examine how errors in the genome contribute to the development and evolution of cancer. Students explore specific genetic conditions which make individuals susceptible to genome instability and cancer. Students understand how changes at the molecular level translate to changes in cellular processes. The laboratory includes cell and molecular biology techniques to address research questions in genome stability and cancer. One lab per week. *Recommended: Bio 305 or Bio 320.*

TTH 9:30-10:45, Steffee B.103

W 1:30-4:20, Steffee B.316

Bio 580 03: Disease Ecology (Dr. Matthew Venesky)

An exploration of host-parasite interactions, highlighting the diverse ecological and evolutionary outcomes of these interactions, as well as the physiological responses that hosts utilize when exposed to parasites. Student examine classic and contemporary topics in the primary literature on disease ecology including costs of host defenses, the evolution of parasite virulence, parasite co-infections, how the environment mediates the outcome of host-parasite, and the effects of host-parasite interactions on ecosystems. In the laboratory, students learn modern ecological, molecular, and physiological techniques and approaches to studying parasitism in an ecological context. One laboratory per week.

TTH 8-9:15, Steffee B.103

M 1:30-4:20, Steffee B.112

***This seminar is an appropriate choice for Neuroscience majors.**

****These seminars are an appropriate choice for Biochemistry majors.**