Descriptions of 2024-2025 BIO 580 - Junior Seminars

Prerequisites: BIO 219 or 220; BIO 221; completion of FSBIO 201 with a grade of C or better; and permission of instructor.

FALL 2024

Cellular Neurobiology - Dr. Lauren French (BIO, NEURO)

An examination of the nervous system ranging from the level of single cells and molecules up to systems level regulation (e.g. pain processing, cardiovascular function). The laboratory uses molecular and electrophysiological techniques to study structure and function of nervous system proteins. One laboratory per week. Recommended: NEURO 110.

Hormones and Behavior - Dr. Jennifer Houtz (BIO, NEURO)

An examination of the neural and endocrine mechanisms underlying behavior in animals and humans through an ecological and evolutionary lens. Students explore topics including hormonal regulation of sex determination, reproductive behavior, parental behavior, social behavior, biological rhythms, and homeostasis/stress. In the laboratory, students learn a mixture of lab techniques (e.g., hormone measurement by enzyme-linked immunosorbent assays and environmental sampling for endocrine disruptors) and field techniques for quantifying behavior in wild animals. One laboratory a week.

Molecular Endocrinology - Dr. Mahita Kadmiel (BIO, BCHEM, NEURO)

An investigation of steroid hormone signaling in human cell lines to understand the mechanisms contributing to the side effects of corticosteroid use. Corticosteroids, a class of synthetic steroid hormones, are commonly used to treat inflammatory diseases and certain types of cancers. Students study the biology of steroid hormone receptors and their implications on human health and disease. The laboratory includes experience in molecular biology techniques (nucleic acid extraction and RT-PCR to study gene expression), cell biology techniques to visualize changes in proteins (immunofluorescence), and assays to examine cellular damage, proliferation rate and apoptosis. One laboratory per week.

SPRING 2025

Pathogenic Bacteriology - Dr. Tricia Humphreys (BIO, BCHEM)

An exploration of bacterial pathogens and how they cause disease. Students study principles of pathogenic microbiology, including where disease-causing organisms come from, how they are transmitted to a host, what factors they use to cause damage to the host and perpetuate their own survival, how the disease is treated, and how transmission can be prevented. The laboratory focuses on factors contributing to virulence using standard microbiology and molecular biology techniques. One laboratory per week.

Disease Ecology - Dr. Matthew Venesky (BIO)

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. Students 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.