**Biology Department Junior Seminars**

**2019-2020**

**FALL 2019**

**Bio 580 01: Cellular Neurobiology** *(Dr. Lauren French)*
An examination of the nervous system at the level of single cells and molecules, with special emphasis on voltage-gated ion channels and ligand-gated receptors. The laboratory uses molecular and electrophysiological techniques to study structure and function of nervous system proteins. One laboratory per week. *Recommended: Neuro 110.*

**TTH 1:30-4:20, Steffee B.302**

**Bio 580 02: 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 11-12:15, 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 9:30-10:45, Steffee B.302**
**M 1:30-4:20, Steffee B.112**

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

**Bio 580 02: Genetic Analysis** *(Dr. Brad Hersh)*

*This seminar is an appropriate choice for Biochemistry majors.*
Bio 580 01: 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.

TTH 11-12:15, Steffee B.103
T 1:30-4:20, Steffee B.212

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.

MW 11-12:15, Steffee B.316
T 1:30-4:20, Steffee B.316

Bio 580 03: The Evolution of Shape (Dr. Lisa Whitenack)
An examination of why living and extinct animals are shaped the way they are from an evolutionary and mechanical perspective. Laboratory topics include biomechanics, functional morphology, and how shape is used to explore evolutionary and ecological relationships of both vertebrates and invertebrates. One laboratory per week.

MWF 8-8:50, Steffee B.103
TH 1:30-4:20, Steffee B.112

Bio 580 04: 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).

MWF 9-9:50, Steffee B.302
TH 1:30-4:20, Steffee B.306
Bio 580 05: Ecology of Local Environments & Conservation (Dr. Casey Bradshaw-Wilson)
An examination of local ecosystems with a focus in conservation biology. One laboratory per week which will be field-based, and emphasizes proper collection techniques and data analysis of the specific research project(s).

TO BE ANNOUNCED

*This seminar is an appropriate choice for Neuroscience majors.
**These seminars are an appropriate choice for Biochemistry majors.