

## **Spring 2021 Special Topics and Project Labs**

### **BIOS 4801 History of Neuroscience (Nichols)**

**TBA (see Oscar), SYNC**

Prerequisites: Permission of instructor

Description: The purpose of this seminar is to learn and explore the history of neuroscience from a perspective of reading classic papers that have evolved. The history of neuroscience can be traced back to at least the time of Rene Descartes and has a history of seminal papers and readings in behavioral, cellular, physiological, computational and cognitive domains. This class will utilize readings of various classical papers, readings of Nobel lectures and chapters to demonstrate the evolution of the field.

### **BIOS 4803 Conservation Biology (Mendelson & Green)**

**MW 02:00 pm-03:15 pm, HYBR**

Prerequisite: BIOS 2300/2310 or BIOL 2335/2337

Credit hours: 3

This course explores major approaches in conservation biology, the ecological principles behind conservation initiatives, and the interdisciplinary challenges arising from social, political and economic factors in conservation efforts. The goal of this class is to explore conservation issues from different levels, ranging from genetics to ecosystems and from small to broad scales. Students will gain competency in analyzing primary literature, identifying uncertainties in conservation science, and discussing the tools needed to implement effective conservation strategies.

### **BIOS 4803 Nutrition (Rosbruck)**

**ASYN**

Prerequisite: APPH 1040/1050

Credit hours: 3

Description: The course is a study of human nutrition as an applied science and covers nutrition physiology: metabolism, energy production, biochemical aspects, role of nutrients, weight control mechanisms, fitness and consumerism.

### **BIOS 4803 Human Pathology (Decker)**

**ASYN**

Prerequisite: BIOS/BIOL/APPH 3753 Human Anatomy

Credit hours: 3

Description: This course will focus on linking our understanding of normal morphology to the abnormal. Once the leap is made, to understanding abnormal structure, we can see how treatments of certain diseases and disorders are possible. The course provides a comprehensive overview of both general and systemic anatomic human pathology. Course will focus on select diseases, their etiology, pathogenesis, morphologic changes, clinical manifestations and the current effective treatments offered.

### **BIOS 4803 Neuromotor Physiology (Balog and Nichols)**

**TR 02:00 pm-03:15 pm, SYNC**

Prerequisites: BIOS/APPH/BIOL 3755 Human Physiology or BME 3100 Systems Physiology

Description: This course focuses on the function and adaptations of the skeletal, nervous and muscular systems. Students will gain understanding of the normal physiological responses of these systems and how each adapts to perturbations such as physical and psychological stressors such as loading and pathology. Interactions among the various systems and their plasticity will be emphasized.

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**BIOS 4803 Chromosome Bio & Human Disease (Lobachev)****TR 12:30 pm-01:45 pm, HYBR**

Prerequisites: BIOS 1107/1207 or BIOL 1510/1511

Credit hours: 3

Course Description: The course will be carried out in a hybrid format. Currently, all lectures, quizzes, and exams are planned to be delivered on-line using BlueJeans. In-person meetings with the professor are possible upon request. Although lectures will be recorded, attendance is required. This course is designed for graduate and upper-level undergraduate students interested in understanding fundamental mechanisms governing the metabolism of eukaryotic chromosomes. Each topic in the class will include an example of a disease that results from the malfunctioning of chromosomal maintenance. The course will include traditional lectures and seminars where research papers will be presented by the enrolled graduate students. This class is an essential resource for students of colleges of science and engineering studying cell, molecular, and developmental biology, as well as biochemistry, genetics, medicine, and all who seek to expand their knowledge of modern genomics and molecular genetics.

**BIOS 4590 A & AL Research Project Lab (Skolnick)****M 03:30 pm-04:20 pm, SYNC****MW 12:30 pm-03:15 pm, SYNC**

This course is taught remote online synchronous. This project lab will cover all aspects of the drug discovery process in a virtual context. Each participant will be expected to identify a disease, the protein target associated with the disease, and then predict possible molecules to treat the disease. Then, an animal model of the disease must be selected. Next, a patient population suitable for Phase I-III clinical trial must be identified and good outcomes defined.

**BIOS 4590 B & BL Research Project Lab (Storici)****T 03:30 pm-04:20 pm, HYBR****TR 12:30 pm-03:15 pm, HYBR**

Topic: This course is designed for upper-level undergraduate students interested in learning molecular biology and basic bioinformatics data analysis techniques and applying them to study biological processes in cells or organisms of choice. No previous experience working in the lab is required. State of the art approaches and tools used for genetic engineering and manipulation of genetic information will be presented. As a result of this training, students will learn basic procedures to work with baker yeast, carry out genomic DNA extractions, design and set up PCR reactions, do restriction digestion analysis, preparation of genomic libraries for high-throughput sequencing, agarose and pulse field gel electrophoresis, and basic bioinformatics procedures for analysis of high-throughput sequencing data. This year course will be focused on studying the composition and patterns of ribonucleotide incorporation in genomic DNA of budding yeast and other cell types. The course will include traditional lectures, laboratory time and individual projects. During individual projects students working as a team in a pair will carry out their own investigation studying composition and patterns of ribonucleotide presence in genomic DNA of the chosen cell or organism types. The course is thus an essential resource for students who seek to expand their knowledge of modern biology tools.

Mode: This course will be in hybrid mode. The lecture part will be via BlueJeans meetings. The laboratory part will require in-person attendance on the Atlanta campus for the first half of the class involving molecular biology experiments. The second part of the class will occur mainly via BlueJeans meetings and may have some in person meetings, depending on assignments. While in the laboratory on campus, students will be required to maintain physical distancing. Students are expected to attend the in-person class sessions unless they have a compelling reason not to do so. Quizzes and individual project reports will be assigned and submitted digitally. No previous experience working in the lab is required.