

# BIOLOGY (BIO)

## **BIO505. Transmission Electron Microscopy. 4 Credits.**

This course has the format of a research project. Students are taught how to use the transmission electron microscope (TEM) as a research tool in the bio-medical disciplines. Students learn first hand the procedures associated with biological sample preparation: embedding, sectioning, staining, examination in the TEM and printing of the final electron photomicrographs.

### **Attributes:**

- Liberal Arts

### **Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

## **BIO508. Scanning Electron Microscopy Annual/Spring. 4 Credits.**

The principles of microscopy sciences with emphasis on the use and applications of the scanning electron microscope (SEM). The course examines the theoretical basis of biological scanning electron microscopy and provides a practical introduction to the operation of the SEM.

### **Attributes:**

- Liberal Arts

### **Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

## **BIO509. Advanced Ornithology Alternate year/Spring. 4 Credits.**

Birds of the world, their taxonomy, anatomy, geographic distribution, ethology, and ecology; laboratory devoted to anatomical studies; methods of photographing birds, recording of bird songs, uses of telemetry, bird behavior, life history studies, identification of local species.

### **Attributes:**

- Liberal Arts

### **Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

## **BIO510. Fungal Biology. 4 Credits.**

Morphology, development, physiology, and ecology of fungi, their significance in diseases, and their utilization by man.

### **Attributes:**

- Liberal Arts

### **Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

## **BIO511. Advanced Vertebrate Zoology Alternate year/Fall. 4 Credits.**

Morphology, physiology, geographical distribution, and evolution of vertebrates of the world. Field and laboratory work devoted to studying life cycles of selected species. Oral presentation and written research paper required.

### **Attributes:**

- Liberal Arts

### **Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

## **BIO514. Plant Diseases. 4 Credits.**

Nature and cause of disease in plants. Special emphasis on fungal diseases of plants.

### **Attributes:**

- Liberal Arts

### **Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

## **BIO516. Molecular Biology Alternate year/Spring. 3 Credits.**

Basic theory and techniques of molecular biology with the analysis of current molecular advances in diverse fields of study. Class discussions, independent literature research, written and oral presentations required.

### **Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

## **BIO517. Molecular Biology Laboratory Alternate year/Fall. 3 Credits.**

Current molecular techniques and theory. Cloning, PCR, DNA preparation, RNA preparation, Southern blots, Northern blots and tissue culture techniques will be employed and analyzed within the context of the immune system. Project required.

### **Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

## **BIO519. Wetlands Ecology Alternate year/Fall. 4 Credits.**

An introduction to the ecology of wetland ecosystems. Structure and function of different types of wetlands will be compared. Alteration and protection will be examined as well as methods used to study them.

### **Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

**BIO520. Advanced Entomology Alternate year/Fall. 4 Credits.**

Major orders of insects with emphasis of life histories. Laboratory opportunity for individual studies of life histories and taxonomic studies of selected orders and families.

**Attributes:**

- Liberal Arts

**Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

**BIO522. Prin Human Biology. 3 Credits.**

An overview of the major aspects of human biology, including physiology, genetics, reproduction, behavior and evolution. In depth coverage of recent advances in the understanding of human biology, including the application of modern technologies and methodologies, as well as evolutionary theory.

**Attributes:**

- Liberal Arts

**Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

**BIO525. Animal Communication. 3 Credits.**

Theory and controversy in the study of animal communication. The various functions, mechanistic, adaptive and evolutionary approaches to communication, information theory, signal transmission, signal reception and human language will be explored. Examples of communication systems will be surveyed across a wide range of taxonomic groups. Examples of hypothesis testing and the analysis of signals will be the focus of class discussions.

**Attributes:**

- Liberal Arts

**Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

**BIO528. Endocrinology. 3 Credits.**

An introduction to the basic principles of endocrinology followed by a study of the physiology and biological chemistry of endocrine tissue and their secretions.

**Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

**BIO530. Human Genetics. 2 Credits.**

Current status of human genetics, with emphasis on molecular aspects. Topics include pedigree analysis, gene mapping strategies, genome organization, chromosome abnormalities, mutations, genetic basis of cancer and the Human Genome Project.

**Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

**BIO540. Immunology Alternate year/Spring. 3 Credits.**

The genetic, cellular, molecular, developmental and biochemical aspects of the immune system will be covered. These aspects are discussed in relation to the disease process and experimental analysis. Discussions of current research are included.

**Attributes:**

- Liberal Arts

**Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

**BIO545. Cell Development and Differentiation. 3 Credits.**

Emphasis is placed upon the mechanisms by which cells specialize during embryogenesis, wound healing, regeneration and transformation. Specific attention to the mechanisms of movement, shape acquisition, and biosynthesis as well as certain new ideas regarding their genetic control.

**Attributes:**

- Liberal Arts

**Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

**BIO546. Human Embryonic Development Annual/Fall. 3 Credits.**

Focuses on the embryology and anatomy of human development. In addition the physiological changes in the pregnant woman are discussed with regard to the developing embryo and fetus.

**Attributes:**

- Liberal Arts

**Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

**BIO550. Recent Advances in Biology. 3 Credits.**

Recent developments in a specialized field of biology. May be repeated for credit at five-year intervals for the same special field.

**Attributes:**

- Liberal Arts

**Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

**BIO561. Endangered Species. 3 Credits.**

Focuses on the conservation of biological diversity. Topics include value of bio-diversity, threats to bio-diversity, vulnerability of species to extinction, conservation of populations and species, and protection of bio-diversity at international, national and local levels.

**Attributes:**

- Liberal Arts

**Restrictions:**

- Must have the following level: Graduate
- Must not be enrolled in the following class: Senior

May not be repeated for credit

**BI0562. Biotechnology. 3 Credits.**

Underlying principles and recombinant DNA methods employed to produce genetically modified organisms for agricultural, environmental, industrial, pharmaceutical and biomedical purposes are covered. Discussions on societal and ethical issues involving biotechnology are included.

**Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

**BI0563. Electron Microscopy. 5 Credits.**

Theory and application of scanning electron microscopy (SEM) and transmission electron microscopy (TEM) are covered. Laboratory includes all aspects of specimen preparation and use of SEM, x-ray diffraction analysis and TEM. This is an advanced course and requires that students have the ability to work individually, taking precautions with hazardous chemicals and delicate equipment.

**Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

**BI0590. Thesis in Biology. 3-6 Credits.**

Writing and defense of a thesis under guidance of major professor. Required form available in the Records and Registration Office.

**Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

**BI0593. Biology Selected Topic. 2-12 Credits.**

Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.

**Restrictions:**

- Must have the following level: Graduate

May be repeated for credit

**BI0594. Fieldwork In Biology. 1-12 Credits.****Restrictions:**

- Must have the following level: Graduate

May not be repeated for credit

**BI0595. Indep Study Biology. 1-12 Credits.****Attributes:**

- Liberal Arts

**Restrictions:**

- Must have the following level: Graduate

May be repeated for credit

**BI0599. Comprehensive Exam Workshop. 0 Credits.**

Non-credit workshop for students who wish to devote the semester immediately following the completion of their coursework to prepare for the comprehensive exam.

**Restrictions:**

- Must have the following level: Graduate
- Must be enrolled in the following field(s) of study (major, minor or concentration): Biology (202)

May not be repeated for credit

**BI0795. Indep Study Bio. 1-12 Credits.****Restrictions:**

- Must have the following level: Graduate

May be repeated for credit

**BI0799. Continued Registration. 1-6 Credits.****Restrictions:**

- Must have the following level: Graduate

May be repeated for credit