**BIOLOGY (BIO)**

*College of the Sciences and Mathematics*

**Courses**

**BIO 511. Experimental Design and Analysis. 3 Credits.**
An introduction to the design and analysis of biological research. An independently conducted research project is a required part of the course. Lab BIL 511. Typically offered in Spring.

**BIO 513. Research Techniques in Bio Sci I. 3 Credits.**
An introduction to the theory and application of histological techniques, and light and electron microscopy. Typically offered in Fall.

**BIO 514. Research Techniques in Bio Sci II. 3 Credits.**
Introduces students to the theory and practical application of selected techniques in biological research, such as radioisotope labeling techniques, spectrophotometry, and various chromatographic procedures. Typically offered in Fall.

**BIO 515. Res Tech III: Computer App in Bio. 3 Credits.**
Use of computers in biological research and data analysis. Topics include image analysis, modeling, and database access for proposal or presentation preparation. Typically offered in Fall.

**BIO 531. Molecular Genetics. 3 Credits.**
This course exposes graduate students interested in gene manipulation to up-to-date information in procaryotic and eukaryotic genetics. Typically offered in Fall.

**BIO 535. Course Topics in Biology I. 3 Credits.**
Lecture/seminar course on the latest topics in ecology, evolution, or organismal biology. Specific content varies depending on faculty involved. Offered in rotation with BIO 536 and 537. May be repeated for credit if a different topic is presented. Repeatable for Credit.

**BIO 536. Course Topics in Biology II. 3 Credits.**
Lecture/seminar course on the latest topics in microbiology, immunology, or molecular genetics. Specific content varies depending on faculty involved. Offered in rotation with BIO 535 and 537. May be repeated for credit if a different topic is presented. Repeatable for Credit.

**BIO 537. Course Topics in Biology III. 3 Credits.**
Lecture/seminar course on the latest topics in cell biology, physiology, or development. Specific content varies depending on faculty involved. Offered in rotation with BIO 535 and 536. May be repeated for credit if a different topic is presented. Repeatable for Credit.

**BIO 540. Design, Analysis & Adapt Concept Sci I. 3 Credits.**
The pragmatic application of advanced biological content in secondary science lesson design, implementation, and assessment with respect to contemporary science education curricular standards.

**BIO 541. Design, Analysis & Adapt Concept Sci II. 3 Credits.**
Lecture/seminar course on the latest topics in microbiology, immunology, or molecular genetics. Specific content varies depending on faculty involved.

**BIO 564. Microbial Physiology. 3 Credits.**
LEC (2), LAB (4)
Physiology and biochemical variations are studied in the prokaryotes and lower eukaryotes. Lab BIL 564. Typically offered in Spring.

**BIO 565. Immunology. 4 Credits.**
LEC (3), LAB (3)
Immunoglobulin structure and function, nature of antigens, cell-mediated immunity, hypersensitivity, regulation of immunity, and immunological diseases. Laboratory experience in immunological techniques. Lab BIL 565. Typically offered in Fall.

**BIO 566. Plant Physiology and Biochemistry. 3 Credits.**
LEC (2), LAB (3)
Plant-cell physiology, including respiration, photosynthesis, enzyme catalysis, auxins, and membrane phenomena. Lab BIL 566. Typically offered in Spring.

**BIO 567. Endocrinology. 3 Credits.**
An integrative look at the physiology of the mammalian endocrine system in the regulation and maintenance of homeostasis. The pathology associated with hormone imbalance will be included. Typically offered in Fall.

**BIO 570. Population Biology. 3 Credits.**
LEC (2), LAB (3)
A quantitative second course in ecology, emphasizing distributional patterns and fluctuations in abundance of natural populations. Lab BIL 570. Typically offered in Fall.

**BIO 571. Wetlands. 3 Credits.**
LEC (2), LAB (3)
A course designed to provide practical experience in wetlands classification, delineation, regulation, management, and mitigation practices. The abiotic and biotic characteristics of inland and coastal wetlands are emphasized. Lab BIL 571. Typically offered in Summer.

**BIO 575. Plant Communities. 3 Credits.**
LEC (2), LAB (3)
A survey of ecological, morphological, and physiological strategies of plants from seed through adult stages. The integration of these strategies to explain the major plant communities of North America will be covered. Lab BIL 575. Typically offered in Fall.

**BIO 576. Freshwater Ecology. 3 Credits.**
LEC (2), LAB (3)
The environmental and biological characteristics of freshwater. Emphasis is placed on field methods, water quality evaluation based on the interpretation of comprehensive datasets, and management strategies for lakes, ponds and streams. Lab BIL 576. Typically offered in Fall.

**BIO 580. Light Microscopy and the Living Cell. 3 Credits.**
Theory and practical techniques of all types of light microscopy and their uses in investigating living cells. Also includes techniques such as microinjection, cell electrophysiology, and others. Strong emphasis on ‘hands-on’ work with equipment. Typically offered in Spring.

**BIO 584. Epidemiology. 3 Credits.**
A general study of the epidemiology of both infectious and environmentally related health problems. Methods of interviewing and data collecting also are included. Typically offered in Fall.

**BIO 590. Directed Study in Biology. 3 Credits.**
In depth study of the literature of a specific topic in biology, under the direction of a faculty member of the Biology Department. Students will read, analyze, discuss, and summarize relevant peer reviewed journal articles. Field or laboratory work may be part of the course, but no research project is to be required. Consent: Permission of the Department required to add.

**BIO 591. Directed Research I. 1-3 Credits.**
To be taken when the student begins his/her nonthesis research. Includes a comprehensive literature search and/or development of specialized techniques. This course should culminate in the acceptance of the nonthesis proposal by an appropriate committee of faculty and is required for degree candidacy.

**BIO 593. Directed Research III. 1-3 Credits.**
A continuation of the research proposed and initiated in BIO 591. To be taken for credit only with the approval of the graduate coordinator. (Does not count towards 30 credits required for graduation.)

**BIO 608. Thesis Research I. 3 Credits.**
To be taken when the student begins his/her thesis research. Includes a comprehensive literature search and development of specialized techniques. This course should culminate in the acceptance of the thesis proposal by an appropriate committee of faculty and is required for degree candidacy.
**BIO 609. Thesis Research II. 1-3 Credits.**
A continuation of the research proposed and initiated in BIO 591. To be taken for credit only with the approval of the graduate coordinator. (Does not count towards 30 credits required for graduation.)

**BIO 610. Thesis. 3 Credits.**
Contact department for more information about this course.