



BIOL - Biology

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Offered in the fall semester. **Co-requisites**

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physiological experimentation. Laboratory required. Offered in the spring semester. **Prerequisites:** BIOL 3010 and BIOL 3011 or permission of the instructor. **Co-requisites:** BIOL 3020 and BIOL 3021 must be taken concurrently.

## **BIOL 3050 Genetics (3)** **BIOL 3051 Genetics: Lab (1)**

This course establishes an understanding of genetic analysis in prokaryotic cells, eukaryotic systems and model organisms, with an emphasis on Mendelian genetics. Topics include transmission genetics, molecular genetics, and population genetics, with a focus on problem solving. Laboratory required. Offered in the spring semester. **Prerequisites:** BIOL 1550, BIOL 1551 and BIOL 1560, BIOL 1561, or permission of the instructor. **Co-requisites:** BIOL 3050 and BIOL 3051 must be taken concurrently.

## **BIOL 3060 Genetics II Lecture (3)**

This course centers around molecular genetics and genomics, with an emphasis on genotypes, gene editing/modification, comparative genomics, population genetics and bioinformatics. This is a hybrid lecture-based course with an experimental component; sessions may include lectures, journal club-like literature studies, activities or lab experiments. **Prerequisites:** BIOL 3050 and BIOL 3051.

## **BIOL 3061 Genetics II Lab (1)**

When offered, this course should be taken concurrently with BIOL 3060, and centers around molecular genetics and genomics, with an emphasis on genotypes, gene editing/modification, comparative genomics, population genetics and bioinformatics. **Prerequisites:** BIOL 3050 and BIOL 3051.

## **BIOL 3080 Cell Biology (3)** **BIOL 3081 Cell Biology: Lab (1)**

Examines cellular structure and function in both eukaryotic and prokaryotic cells. This course provides the foundation for understanding modes of cellular communication, such as channels, receptors, messenger systems, and cell cycle processes. Energy production, storage, and utilization are also discussed. Offered in the spring semester. **Prerequisites:** BIOL 3050 and BIOL 3051 or instructor permission. **Co-requisites:** BIOL 3080 and BIOL 3081 taken concurrently.

## **BIOL 3200 Ecology (3)** **BIOL 3201 Ecology: Lab (1)**

Defines ecosystems, examines how they function, and how human intervention changes that function. Emphasizes world ecosystems. Laboratory required. Offered in the fall semester. **Prerequisites:** BIOL 1550 and BIOL 1560, or permission of the instructor. **Co-requisites:** BIOL 3200 and BIOL 3201 must be taken concurrently.

## **BIOL 3600 Topics in Biology (1-4)**

Provides for in-depth analysis of issues and topics of specialized interest to advanced students in the life sciences. May be repeated for credit if content differs. **Prerequisite:** Junior standing or permission of the instructor.

## **BIOL 3700 Plant Physiology (3)** **BIOL 3701 Plant Physiology: Lab (1)**

Plant physiology is the study of how plants function and grow. This course aims to broaden students' understanding of how physical, chemical, and biotic factors affect the life of a plant.

Emphasis will be placed on water relations, metabolism, and regulation of plant growth and development. Students will be expected to read, present, and discuss research from current scientific articles about plant physiology. Laboratory required. **Prerequisites:** BIOL 1560 and CHEM 1110, or permission of the instructor. **Co-requisites:** BIOL 3700 and BIOL 3701 must be taken concurrently.

## **BIOL 3900 Journal Club (3)**

Keeping up with current scientific knowledge requires reading the latest scientific publications. This journal club course will focus on a specific area of research and delve into recent progress made in this field. Students will gain an in-depth understanding of the principles, techniques, and context of the subject while developing their skills in oral communication. This course can be repeated for credit, as the topics and research papers will differ each time. However, the course can only count one time toward the major. **Prerequisites:** BIOL 1550 and BIOL 1560, or permission of the instructor.

## **BIOL 4050 Gene Expression (3)**

Reviews the structure and function of chromosomes, the regulation of gene expression, and the molecular basis of gene mutation. Special topics will include gene regulation during development, the genetic basis of cancer, and the use of transgenic model systems. **Prerequisites:** BIOL 3050, BIOL 3051 and BIOL 3080, or permission of the instructor.

## **BIOL 4300 Immunology (3)**

Provides the student with a detailed understanding of the mechanisms involved in protecting the body from infections and other potential sources of tissue damage. It examines the workings of the immune system and the interrelationships among its cell types. **Prerequisite:** BIOL 3080, or permission of the instructor.

## **BIOL 4400 Research Methods (3)**

Lecture and discussion of the research process from question formulation to planning, design, methodology analysis, and preparation of a research proposal. **Prerequisites:** BIOL 1550, BIOL 1551, BIOL 1560, BIOL 1561, BIOL 2010, BIOL 3050, BIOL 3051, CHEM 1100, CHEM 1101, CHEM 1110, CHEM 1111, CHEM 2100 and CHEM 2101. Senior status in BA biology or BS biological sciences, or permission of the instructor.

## **BIOL 4420 Senior Thesis for BA in Biology (4)**

Students working toward a BA in biology will enroll in this course to complete their senior research project in the laboratory or field. Completion of the project will culminate with a scientific write-up and oral presentation of research results at a formal meeting of faculty and peers. Student must complete all required coursework for the major, including BIOL 4400 Research Methods, or receive permission of the instructor.

## **BIOL 4430 Senior Thesis for BS in Biological Sciences (4)**

Students working toward a BS in biological sciences will enroll in this courses to complete their senior research project in the laboratory or field. Completion of the project will culminate with a scientific write-up in publishable format. Research results will be presented at a formal meeting with faculty and peers. Student must complete all required coursework for the major, including BIOL 4400 Research Methods, or receive permission of the instructor.

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## BIOL 4500 Virology (5)

Investigates the fundamental processes of viral evolution, classification, infection of host, pathogenesis, and viral replication. The use of viruses in biomedical research will be presented in order to understand the methodologies for the isolation, identification, and detection of viruses. **Prerequisites:** BIOL 3050, BIOL 3051, BIOL 3080, BIOL 3081 and CHEM 3100, or permission of the instructor.

## BIOL 4610 Reading Course (1-4)

May be repeated for credit if content differs. **Prerequisites:** Permission of the department chair and filing of the official form.

## BIOL 4700 Independent Research in Biology I (1-4)

A specialized course for students working on an independent, research-oriented project in a topic of current interest. Students should select among the equivalent courses BIOL 4700/CHEM 4700/PHYS 4700 for the one that is most consistent with their chosen project. For BIOL 4700, the topic should have a primary basis in biology. Also offered during the summer term. May be repeated once for credit if content differs. **Prerequisite:** Permission of the instructor.

## BIOL 4710 Independent Research in Biology II (1-4)

A specialized course for students working on an independent, research-oriented project in a topic of current interest. Students should select among the equivalent courses BIOL 4710/CHEM 4710/PHYS 4710 for the one that is most consistent with their chosen project. For BIOL 4710, the topic should have a primary basis in biology. Also offered during the summer term. May be repeated once for credit if content differs. **Prerequisite:**