

# Biology

Biology is the scientific study of the living world. Emphasis is on integrated concepts showing the effect of biological knowledge on all areas of human endeavor. Basic themes include cellular metabolism, cellular structure, mechanisms of heredity, development, evolution, ecology and behavior.



**REQUIREMENTS FOR A BIOLOGY MAJOR** – A minimum of 31-34 hours of Biology as listed below:

			<b>Hours</b>
BIO	141W	Principles of Biology I	4
BIO	142W	Principles of Biology II	4
BIO	320W	Bacteriology and Virology	4
BIO	360W	Genetics	4
S&M	200W	Methods of Science and Critical Thinking	4
<i>Plus one of the following two courses:</i>			3-4
BIO	281W	Animal Behavior	3
BIO	300W	Ecology	4
<i>Plus one of the following four courses:</i>			4
BIO	342W	Comparative Vertebrate Anatomy	4
BIO	370	Physiology	4
BIO	325W	Immunology	4
BIO	264	Human Anatomy and Physiology II	4
<i>Plus one of the following two courses:</i>			4
BIO	330W	Developmental Biology	4
BIO	466W	Organic Evolution	3
<i>Plus one or more electives from the following:</i>			3-4
BIO	241W	Introduction to Botany	4
BIO	242W	Introduction to Zoology	4
BIO	264	Human Anatomy and Physiology II	4
BIO	281W	Animal Behavior	3
BIO	300W	Ecology	4
BIO	325W	Immunology	4
BIO	330W	Developmental Biology	4
BIO	342W	Comparative Vertebrate Anatomy	4
BIO	370	Physiology	4
BIO	466W	Organic Evolution	3
<b>TOTAL:</b>			<b>31-34</b>
<i>Plus required supporting courses outside the major area:</i>			
CHM	131	General Chemistry I	4
CHM	132	General Chemistry II	4
CHM	220	Organic Chemistry I	4
CHM	221	Organic Chemistry II	4
<b>or</b> CHM	322	Biochemistry	3
MAT	121	Precalculus	4

**REQUIREMENTS FOR A SCIENCE MAJOR (BIOLOGY DESIGNATION) WITH TEACHER CERTIFICATION** – (1) 44 hours of coursework including the following:

			<i>Hours</i>
BIO	141W	Principles of Biology I	4
BIO	142W	Principles of Biology II	4
BIO	300W	Ecology	4
BIO	342W	Comparative Vertebrate Anatomy	4
BIO	320W	Bacteriology and Virology	4
BIO	360W	Genetics	4
CHM	131	General Chemistry I	4
PHS	110	Introduction to Physical Science	4
PHS	111	Introduction to Earth Science	4
PHS	112	Introduction to Astronomy	4
S&M	200W	Methods of Science and Critical Thinking	2

**TOTAL:** **42 hours**

*Plus the following supplemental courses:* 3-4

MAT	121	Precalculus	4
CHM	132	General Chemistry II	4
CHM	220	Organic Chemistry I	4
CHM	221	Organic Chemistry II	4
<b>or</b> CHM	322	Biochemistry	3

(2) Plus Professional Education Course Requirements. (For a list of these courses, please refer to the Education section of the catalog concerning requirements for certification in Secondary Education.)

(3) To qualify for Student Teaching, a student must have an overall 2.50 GPA and a 2.75 GPA in the Science major outlined above.

**REQUIREMENTS FOR BIOLOGY MINOR** – a minimum of 19–20 hours including:

			<i>Hours</i>
BIO	141W	Principles of Biology I	4
BIO	142W	Principles of Biology II	4
BIO	300W	Ecology	4
BIO	342w	Comparative Vertebrate Anatomy	3-4

*Plus one or two electives from the following:* 3-4

BIO	241W	Introduction to Botany	4
BIO	242W	Introduction to Zoology	4
BIO	264	Human Anatomy and Physiology II	4

BIO	281W	Animal Behavior	3
BIO	320W	Bacteriology and Virology	4

**TOTAL:** **19-20 hours**

### **REQUIREMENTS FOR MAJORS IN BIOLOGY/CLINICAL LABORATORY**

**SCIENCE AND BIOLOGY/OCCUPATIONAL THERAPY**– Please refer to sections on CLINICAL LABORATORY SCIENCE and OCCUPATIONAL THERAPY.

## **Biology Courses**

### **BIO 130 General Biology** **4 hours**

Basic principles of biology (evolution, ecology, cell structure and function, genetics) are presented in a manner consistent with the needs of a liberally educated person. What does evolution imply about our origin and purpose? What effects have human activities had on the biosphere? What is the nature of scientific inquiry? These and other questions are the subject matter of this course. Lecture and laboratory.

### **BIO 136W Evolution for Everyone** **4 hours**

Describes the importance and impact of evolution on human thought. Suitable as an introductory science course for non-science majors and science majors alike. Course begins with a discussion of the nature of science, history of evolutionary thought, and the controversy between religion and science, followed by DNA and genetics. Course concludes with a close examination of modern evolutionary theory, including the Hardy-Weinberg-Castle theorem, population genetics, and speciation. Lecture and laboratory.

### **BIO 141W Principles of Biology I** **4 hours**

Introduction to biology expressly designed for students interested in majoring in biology or in a pre-professional program. Presents the basic principles of biology (evolution, ecology, cell structure and function, genetics) in some detail. Lecture and laboratory.

### **BIO 142W Principles of Biology II** **4 hours**

*Prerequisite: BIO 141W.*

Continued examination of biological principles for those interested in science as a career. Examines the anatomy and physiology of the major groups of organisms. Lecture and laboratory.

### **BIO 163 Human Anatomy and Physiology I** **4 hours**

An introduction to biology, basic biochemistry and genetics with a detailed study of cell structure and metabolism, tissue types and their structures, and human blood and endocrine system structure and function. An introduction to human embryological growth and aging processes is taught. Pathologies within each system area also included. Lecture and laboratory.

- BIO 241W Introduction to Botany** **4 hours**  
*Prerequisite: BIO 142W. (Offered in alternate years)*  
 Detailed examination of plant structure, function, evolution, and ecology. The systematics of plants, fungi, and algae are emphasized. Lecture, laboratory and field trips.
- BIO 242W Introduction to Zoology** **4 hours**  
*Prerequisite: BIO 142W. (Offered in alternate years)*  
 Detailed examination of animal structure, function, evolution and ecology. The systematics of animals and animal-like protists are emphasized. Lecture, laboratory and field trips.
- BIO 264 Human Anatomy and Physiology II** **4 hours**  
*Prerequisite: BIO 163 or 142W.*  
 Detailed examination of the human skeletal, muscular, nervous, cardiovascular, respiratory, urinary, digestive and reproductive systems. Pathologies within each systems are also included. Lecture and laboratory.
- BIO 281W Animal Behavior** **3 hours**  
*Prerequisite: BIO 130 or 141W and PSY 101. (Offered in alternate years)*  
 Survey of behavioral mechanisms employed by animals in their “Struggle for Existence.” Topics include the history of behavior as a science, the evolution and genetics of behavior, the physiology of behavior, and sociobiology. Lecture.
- BIO 300W Ecology** **4 hours**  
*Prerequisite: BIO 142W. (Offered in alternate years)*  
 Scientific study of the factors affecting organismal distribution and abundance. Topics include dispersal, habitat selection, population growth, population interactions, community structure, nutrient cycling and energy flow. Lecture, laboratory and field trips.
- BIO 320W Bacteriology and Virology** **4 hours**  
*Prerequisite: BIO 130 or 163 or 142W and CHM 131.*  
 Study of bacteria and viruses including their structure, classification, growth, physiology, metabolism, and biological importance. Their medical importance is compared to other microbes including protozoa, algae fungi and parasitic helminthes. Includes discussion of ecological importance and industrial applications for microbes. Lecture and laboratory.
- BIO 325W Immunology** **4 hours**  
*Prerequisite: BIO 142W and CHM 221. (Offered in alternate years)*  
 Detailed evaluation of the biological and clinical aspects of immunology. Topics covered include antigen and antibody structure, genetic and cellular basis for antibody formation, hypersensitivity, complement, cell-mediated immunity, histocompatibility,

autoimmunity, immunity to infectious diseases, comparative immunology, and immunological applications in science. Lecture and laboratory.

**BIO 330W Developmental Biology** **4 hours**

*Prerequisite: BIO 142W. Recommended Prerequisite: BIO 242W, BIO 360. (Offered in alternate years)*

Detailed examination of the principles of organismal development. Topics include genetic control of development, environmental impact on developmental processes, descriptive embryology and developmental constraints. Lecture and Laboratory included.

**BIO 342W Comparative Vertebrate Anatomy** **4 hours**

*Prerequisite: BIO 142W. (Offered in alternate years)*

Comparative study of structure, function and evolution of vertebrate animals from both descriptive and analytical viewpoints.

**BIO 360W Genetics** **4 hours**

*Prerequisite: BIO 142W; pre- or co-requisite: CHM 221.*

Fundamental principles of heredity, cyto-genetics, molecular and population genetics. Lecture and laboratory.

**BIO 370 Physiology**

**4 hours**

*Prerequisite: BIO 142W. (Offered in alternate years)*

Physiological study of animals by body systems, organs, and molecular activities. Both chemical and physical interactions are considered in maintaining a normal internal environment which is necessary in response to the animal's environment. Lecture and laboratory.

**BIO 466W Organic Evolution** **3 hours**

*Prerequisite: BIO 360W. (Offered in alternate years)*

Detailed evaluation of evolutionary biology. Topics include population genetics, natural selection, the neutral theory of evolution, speciation, macroevolution, the fossil record, and co-evolution. Lecture.