

# BIOLOGY

**College .....Arts and Science**

**Academic Award .....Bachelor of Science**

**Credits Required ..... 125 semester credits**

**Coordinator.....Eric Steinkamp**

*The study of biology strives to understand the natural world we live in, including the human body. A career in biology involves curiosity of how living things work, how they interact with each other and the non-living world and how our actions influence nature and our bodies. Studying biology causes us to ask questions, make observations, describe potential answers, design studies, collect evidence, evaluate data and solve problems. Biologists may use a microscope to study human health and diseases, or a single celled organisms effect on the environment, Biology may also use nets to capture migrating birds and understand their contribution habitats along their migratory routes, or use a greenhouse to grow native plants which will be transplanted in ecosystem recovery efforts.*

## **B.S. Biology Degree Objectives**

- The student will be able to apply the scientific method to research problems in the biology field.
- The student will be able to effectively use appropriate technology in the study of biology.
- The student will be able to use knowledge to score well on standardized tests for their associated field.
- The student will participate in cross cultural experiences.
- The student will develop their scientifically-informed worldview and communicate that through writing;
- The student will develop scholarly skills for research, writing, and presentation in scientific fields.

Students majoring in biology have a wide range of interesting and challenging career opportunities. Accordingly, the major is designed to enable a student to choose a track that supports his or her chosen career path. Following the completion of the Foundations phase of the biology curriculum, a student should apply for admission to the biology major and, in consultation with a science advisor, choose the track that provides the basis for further education or chosen career path. The tracks from which a student may select are: Animal biology (pre-veterinary), Pre-health (Physician's Assistant, Physical Therapy, Naturopathy, and others), Pre-Medicine, and General Science.

### **Animal Biology Track**

The animal biology track prepares students to apply for admission to veterinary schools, or to graduate study relating to the study of animals.

Recognizing that the admission to veterinary schools is highly competitive, the student should work closely with

his or her advisor to meet the admission standards set by the professional schools.

### **Pre-Health Track**

This track prepares a student to enter training for a variety of healthcare careers such as Physician's assistant, Physical Therapy, Naturopathy, and more. Because these careers have rigorous programs of study and training required for certification, they often have specific requirements for admission. The student, upon entering the track, should work with her or his advisor to meet the entrance requirements for the specific career training programs.

### **Pre-Medicine Track**

The pre-medicine track develops students as scholarly professionals who are dedicated to pursuing advanced studies in medicine and who are qualified for admission to professional schools. Because admission into medical schools is highly competitive and selective, students in this track will be carefully guided toward meeting the standards for admission set by the Association of American Medical Colleges. A student entering this program with a goal of gaining admission to a professional school accepts the personal responsibility to carefully prepare for application by achieving strong grades and pursuing service experiences in health sciences. Participation in an advising cohort aimed at developing the whole student as a potential professional enhances the possibility of achieving the goal of admission to a professional school

### **General Science Track**

The general biology track develops students as scholarly professionals who are dedicated to working in the scientific community, or who are prepared to pursue graduate studies in the sciences. Students who complete this degree track will be well prepared to enter fields of employment appropriate to a B.S. degree. In addition, the student will participate in development oriented cross-cultural scientific experiences that provide a rich understanding of the interplay of science and human well-being, and that give a unique preparation for entering the job market, or for pursuing admission to graduate programs in advanced fields of study.

# BIOLOGY – MAJOR

## CORE CURRICULUM REQUIREMENTS ----- 43

### **Bible and Theology** ..... 12

BIBL	1103	Old Testament History and Literature .....	3
BIBL	1203	New Testament History and Literature.....	3
THEO	1213	Christian Thought .....	3
THEO	2323	Jesus the Messiah.....	3

### **Written and Verbal Communications**..... 9

ENGL	1013	Composition I: Expository Writing .....	3
ENGL	1023	Composition II: Rhetoric and Research Writing.....	3
COMM	1213	Fundamentals of Speech Communication .....	3

### **Humanities** ..... 3

Credits in this area must be from Writing Practice courses\* (*see course descriptions for applicability*)  
 3 credits selected from the following.....3  
     Art (ARTE), Bible (BIBL), Drama (DRAM), English (ENGL),  
     History (HIST), Language (LANG), Music (MUSI), or Theology (THEO)

### **Social Sciences**..... 6

6 credits in this area must be from Writing Practice courses\* (*see course descriptions for applicability*)  
 Select a minimum of two disciplines from the following:  
     Business Administration (BUSM), Communication (except COMM 1213), Economics, Education (EDUC),  
     Geography (GEOG), Health & Fitness (PEDU), Management (BMGT), Marketing (BMKT), Philosophy  
     (PHIL), Political Science (PSCI), Psychology (PSYC), or Sociology/Anthropology (SOCI)

### **Formation and Calling** ..... 5

UCOR	1043	Faith in Society .....	3
UCOR	1052	Identity and Vocation .....	2
UCOR	4791	Faith Integration .....	***

\*\*\* *Content met in SCIE 3332 – Integration and Development*

### **Core Electives**..... 8

*Any college-level courses*

# BIOLOGY – MAJOR

## BIOLOGY MAJOR REQUIREMENTS -----76-77

### PHASE I: Foundations..... 42

MATH	1243	Calculus I.....	3
MATH	2003	Introduction to Statistics.....	3
SCIE	1283/1	Physics I w/lab.....	4
SCIE	1293/1	Physics II w/lab.....	4
SCIE	1333/1	General Chemistry I w/lab.....	4
SCIE	1343/1	General Chemistry II w/lab.....	4
SCIE	2053/1	General Biology I w/lab.....	4
SCIE	2063/1	General Biology II w/lab.....	4
SCIE	2433/1	Organic Chemistry I w/lab.....	4
SCIE	2443/1	Organic Chemistry II w/lab.....	4
SCIE	2403/1	Environmental Science w/lab.....	4

*Upon satisfactory completion of Phase I courses the student must be formally admitted to the Biology major to continue.*

### PHASE II: Major Tracks (choose one of the following tracks)..... 30-32

- Animal Biology (Pre-Veterinarian).....30
- Pre-Health (PA, PT, Naturopath & others).....30
- Pre-Medicine ..... 30-32
- General Science .....30

### PHASE III: Integration and Application..... 4

SCIE	3332	Integration and Development.....	2
SCIE	4432	Scientific Cross-cultural Experience.....	2

## GENERAL ELECTIVES -----5-6

*Any college-level courses*

# BIOLOGY – TRACKS

## ANIMAL BIOLOGY TRACK -----30

*(Pre-Veterinarian)*

### Required Courses..... 15

SCIE	3104	Microbiology w/lab .....	4
SCIE	3313/1	Invertebrates w/lab .....	4
SCIE	3323/1	Vertebrates w/lab .....	4
SCIE	4223	Bioethics .....	3

### Science/Math Electives *(select from the following)* ..... 15

MATH	2245	Calculus II .....	5
SCIE	2203/1	Anatomy and Physiology I w/lab.....	4
SCIE	2213/1	Anatomy and Physiology II w/lab .....	4
SCIE	3113/1	General Botany w/lab .....	4
SCIE	3143/1	Genetics w/lab .....	4
SCIE	3403/1	Cell Biology w/lab.....	4
SCIE	3712	Sustainable Technologies I .....	2
SCIE	3722	Sustainable Technologies II.....	2
SCIE	4133	Evolutionary Theories .....	3
SCIE	4153/1	Ecology w/lab .....	4
SCIE	4413/1	Resource Management w/lab.....	4
SCIE	4423/1	Biochemistry w/lab.....	4
SCIE	4921/4	Research Topics.....	1-3

## PRE-HEALTH TRACK -----30

*(PA, PT, Naturopath and others)*

### Required Courses..... 18

SCIE	2203/1	Anatomy and Physiology I w/lab.....	4
SCIE	2213/1	Anatomy and Physiology II w/lab .....	4
SCIE	2613	Diet and Nutrition .....	3
SCIE	3104	Microbiology w/lab .....	4
SCIE	4223	Bioethics .....	3

### Science/Math Electives *(select from the following)* ..... 12

MATH	2245	Calculus II .....	5
SCIE	3113/1	General Botany w/lab .....	4
SCIE	3143/1	Genetics w/lab .....	4
SCIE	3313/1	Invertebrates w/lab .....	4
SCIE	3323/1	Vertebrates w/lab .....	4
SCIE	3403/1	Cell Biology w/lab.....	4
SCIE	3712	Sustainable Technologies I .....	2
SCIE	3722	Sustainable Technologies II.....	2
SCIE	4133	Evolutionary Theories .....	3
SCIE	4153/1	Ecology w/lab .....	4
SCIE	4413/1	Resource Management w/lab.....	4
SCIE	4423/1	Biochemistry w/lab.....	4
SCIE	4921/4	Research Topics.....	1-3

# BIOLOGY – TRACKS

**PRE-MEDICINE TRACK ----- 30-32**

**Required Courses..... 27**

SCIE	2203/1	Anatomy and Physiology I w/lab.....	4
SCIE	2213/1	Anatomy and Physiology II w/lab .....	4
SCIE	3104	Microbiology w/lab .....	4
SCIE	3143/1	Genetics w/lab .....	4
SCIE	3403/1	Cell Biology w/lab.....	4
SCIE	4223	Bioethics.....	3
SCIE	4423/1	Biochemistry w/lab.....	4

**Science/Math Electives (select from the following) ..... 3-5**

MATH	2245	Calculus II .....	5
SCIE	3313/1	Invertebrates w/lab .....	4
SCIE	3323/1	Vertebrates w/lab.....	4
SCIE	3712	Sustainable Technologies I.....	2
SCIE	3722	Sustainable Technologies II.....	2
SCIE	4133	Evolutionary Theories .....	3
SCIE	4921/4	Research Topics.....	1-3

**GENERAL SCIENCE TRACK ----- 30**

**Science/Math Electives (select 30 credits from the following) ..... 30**

MATH	2245	Calculus II .....	5
MATH	3245	Calculus III .....	5
SCIE	2203/1	Anatomy and Physiology I w/lab.....	4
SCIE	2213/1	Anatomy and Physiology II w/lab .....	4
SCIE	3104	Microbiology w/lab .....	4
SCIE	3143/1	Genetics w/lab .....	4
SCIE	3313/1	Invertebrates w/lab .....	4
SCIE	3323/1	Vertebrates w/lab.....	4
SCIE	3403/1	Cell Biology w/lab.....	4
SCIE	3712	Sustainable Technologies I.....	2
SCIE	3722	Sustainable Technologies II.....	2
SCIE	4133	Evolutionary Theories .....	3
SCIE	4223	Bioethics.....	3
SCIE	4423/1	Biochemistry w/lab.....	4
SCIE	4921/4	Research Topics.....	1-3
SCIE	3000/4000	Science Electives.....	1-4

*(In consultation with student's advisor)*

## BIOLOGY – MINOR

**College .....Arts and Sciences**

**Academic Award .....Minor**

**Credits Required .....20 semester credits**

**Coordinator.....Eric Steinkamp**

*A minor in biology will help the student improve their career options and opportunities. It is designed to provide skills and knowledge in the biology field above and beyond their major. Many courses in the sciences have prerequisites. These can be met by careful attention when selecting Core Curriculum Science and Math courses. Specific prerequisites for this minor include:*

MATH 2003 Introduction to Statistics  
SCIE 1203/1 Survey of Chemistry I w/lab

### **MINOR REQUIREMENTS -----20**

SCIE 1213/1 Survey of Chemistry II w/Lab .....4  
SCIE 2053/1 General Biology I w/lab.....4  
SCIE 2063/1 General Biology II w/lab .....4  
SCIE Science Electives .....8

*Select remaining credits from:*

SCIE 2203/1 Anatomy and Physiology I w/lab  
SCIE 2213/1 Anatomy and Physiology II w/lab  
SCIE 2403/1 Environmental Science w/Lab  
SCIE 3104 Microbiology w/lab  
SCIE 3113/1 General Botany w/lab  
SCIE 3143/1 Genetics w/lab  
SCIE 3313/1 Invertebrates w/lab  
SCIE 3323/1 Vertebrates w/lab  
SCIE 3403/1 Cell Biology w/lab  
SCIE 4153/1 Ecology w/lab  
SCIE 4423/1 Biochemistry w/lab

*For Science majors wanting to take a science minor, no more than 5 credits may overlap with Bachelor of Science major.*