

# BIOLOGY

## TRANSFER

**CONTACT PERSON:** • Jean Rolandelli • Jack Science Center 201H • 224-5401 • Jean.Rolandelli@bsc.nodak.edu

Biology is the study of life, of plants and animals and their relationships in and to their environments. The biology program at BSC provides the fundamentals for students pursuing a career in any of the biological sciences. Students who complete the suggested two-year curriculum receive an Associate in Science degree and can transfer to bachelor degree programs at four-year colleges and universities.

Biology is also an important part of the foundation of many career fields including biological and environmental engineers. Agriculture, wildlife management and medicine are other areas that require strong backgrounds in biology.

Students interested in any biological profession are strongly encouraged to become trained in Geographic Information System (GIS) technology.

The courses listed below are required at most colleges granting a degree in biology. Students should consult the catalog of the college to which they plan to transfer in selecting specific courses.

**Career Possibilities:** Biologist, Botanist, Microbiologist, Medicine, Cytotechnologist, Plant or Animal Ecologist, Wildlife Manager, Zoologist.

## SUGGESTED CURRICULUM FOR ASSOCIATE IN SCIENCE:

FRESHMAN	CREDITS
College Composition I-II (ENGL 110-120).....	6
Fundamentals of Public Speaking (COMM 110) .....	3
General Biology I-II (BIOL 150-151) .....	6
General Biology Lab I-II Lab (BIOL 150L-151L) .....	2
General Chemistry I&II (CHEM 121-122).....	8
General Chemistry I&II Lab (CHEM 121L-122L) .....	2
*Mathematics 104 and 146 .....	6
Biology Elective.....	3-4
**Fundamentals of Geographic Information Systems (GIS 105) .....	3
Total credits.....	39-40

Suggested Electives: Basic Computer Programming, Statistics, MICR 202 & 202L, BIOL 220-221, 220L-221L, BOT 170-170L, BIOL 197, 297, BIOL 124, GIS 105, 107, 201, GEOG 121/121L.

\*\*Students who would like a Certificate of Completion in Geographic Information Systems need to take GIS 105 in their first or second semester. They will also need to include GEOG 121 and 121L in their course work.

SOPHOMORE	CREDITS
Organic Chemistry (CHEM 241-242).....	8
Organic Chemistry Lab (CHEM 241L-242L) .....	2
Arts and Humanities Electives.....	6
Social Science Electives .....	6
College Physics I-II (PHYS 211-212) .....	6
College Physics I-II Lab (PHYS 211L-212L) .....	2
Enrichment.....	2
Total credits.....	32

\*MATH 107 or MATH 103 and 105 may be substituted for MATH 104 and 146.

## BIOLOGY (ASC, BIOL, BOT, MICR)

### ACADEMIC SKILLS COURSES

**ASC 098 Basic Biology** **BD** **3 credits**  
The study of Basic Biology 098 is intended to help those students without sufficient background in biology and chemistry to be successful in General Biology 150, Introductory Microbiology 202 or Anatomy & Physiology 220. Selected topics will include: chemistry as required to comprehend biology, basic cellular concepts, and human body systems and their functions. Concurrent registration in or previous successful completion of ASC 098L is required.

**ASC 098L Basic Biology Lab** **BD** **1 credit**  
Basic Biology 098 Lab is intended to help familiarize students with techniques and equipment necessary to be competent in the laboratory. Lab work will focus on introducing students to the process of scientific investigation, the use and care of the microscope, basic biological concepts, and the structure and function of the human body. Concurrent registration in or previous successful completion of ASC 098 lecture is required.

## COLLEGE LEVEL COURSES

<b>BIOL 102</b>	<b>Introduction to Aquarium Keeping</b>	<b>F&amp;S</b>	<b>1 credit</b>
Introduction to Aquarium Keeping will explore the types of aquaria, aquarium equipment and maintenance, plants and animals for the aquarium and how to troubleshoot problems aquarium keepers may face.			
<b>BIOL 108</b>	<b>Beginning Birding</b>	<b>Spring</b>	<b>1 credit</b>
This course is an introduction to the fascinating world of birds. Students will become familiar with the tools of birding such as binoculars, spotting scopes, field guides, and multimedia references. The course will also focus on characteristics of bird families and the identification of individual species before we go out in the field. The last portion of the class will concentrate on locating and identifying birds in their natural habitats. Students must be able to walk over uneven terrain.			
<b>BIOL 109</b>	<b>The Living World</b>	<b>F&amp;S</b>	<b>3 credits</b>
This course will cover basic concepts in biology, natural history, sociobiology and human biosocial interaction. The course is not intended for students pursuing careers in the biological sciences or students requiring a full year of general biology. This course does not meet the lab science requirement.			
<b>BIOL 111</b>	<b>Concepts of Biology</b>	<b>F&amp;S SM</b>	<b>3 credits</b>
Biology 111, in conjunction with Biology 111L, is designed to fulfill the lab science requirement of the student planning a non-science major. Included are discussions on the nature of living things, genetics, DNA, biotechnology, evolution, the diversity of living things, and ecology. Concurrent registration in or previous successful completion of BIOL 111L is required.			
<b>BIOL 111L</b>	<b>Concepts of Biology Lab</b>	<b>F&amp;S SM</b>	<b>1 credit</b>
Biology 111L, in conjunction with Biology 111, is designed to fulfill the lab science requirement of the student planning a non-science major. Included are laboratory activities on the nature of scientific thinking, genetics, biotechnology, evolution and ecology. Concurrent registration in or previous successful completion of BIOL 111 is required.			
<b>BIOL 124</b>	<b>Environmental Science</b>	<b>F&amp;S</b>	<b>3 credits</b>
An introduction to the basic concepts of ecology will provide the framework for investigating current and potential environmental problems. Over-population, air & water pollution, contamination of food, accumulation of medical & other biohazardous wastes, and depletion & exploitation of natural resources will be discussed. The role of individuals, businesses, and professions in limiting environmental problems will be stressed. No prerequisite. This course does not meet the lab science requirement, but it counts as a science course.			
<b>BIOL 126</b>	<b>Human Biology</b>	<b>F&amp;S</b>	<b>3 credits</b>
Biology 126 is designed to be an introduction for students planning on taking higher level anatomy and physiology courses. The course will include a wide range of topics associated with the human body and human life. This course, when taken with the associated lab, will fulfill the lab science requirements for the student planning a non-science major.			
<b>BIOL 126L</b>	<b>Human Biology Lab</b>	<b>F&amp;S</b>	<b>1 credit</b>
Biology 126L, in conjunction with Biology 126, is designed to introduce students to the study of human anatomy and physiology. Included are laboratory activities on structure and function of the human body.			
<b>BIOL 150-151</b>	<b>General Biology I&amp;II</b>	<b>F&amp;S</b>	<b>3 credits each</b>
Biology 150 (no prerequisite) will cover the fundamental concepts of biology. Included will be discussions of the cellular nature of living things, cell anatomy and basic cell physiology. Special emphasis will be placed on DNA and protein synthesis, cellular respiration, photosynthesis, and the cell cycle. Instruction in Mendelian inheritance and molecular genetics will complete the semester. Biology 151 (no prerequisite) introduces theories of the origins of life on earth, evolution and describes current biological diversity. An overview of prokaryotes, protists, fungi, animals and plants will be included. The final segment of the course will include discussions on biogeography, population dynamics and community ecology. Concurrent registration in or previous successful completion of BIOL 150L-151L is required.			
<b>BIOL 150L-151L</b>	<b>General Biology I-II Lab</b>	<b>F&amp;S</b>	<b>1 credit each</b>
Laboratories to accompany BIOL 150- 151. Concurrent registration in or previous successful completion of BIOL 150-151 is required.			
<b>BIOL 213</b>	<b>General Pathology</b>	<b>Fall</b>	<b>2 credits</b>
This course will give students basic introduction to the human disease process. It will encompass an overview of normal anatomy and physiology followed by discussions relating to diagnoses, signs, symptoms and treatment options for various diseases in the 12 body systems.			
<b>BIOL 220</b>	<b>Anatomy and Physiology I</b>	<b>F&amp;S</b>	<b>3 credits</b>
Prerequisite: BIOL 126 or departmental consent; chemistry strongly recommended. This is the first in a sequence of two courses in which discussions of anatomy and physiology are interwoven in an attempt to present a unified picture of the structure and function of the organs and systems of the human body. These courses include general chemistry principles, biochemistry, cells, tissues, and the following systems: integumentary, skeletal, muscular, nervous, and special senses. Both gross and microscopic structures are studied. Concurrent registration in or previous successful completion of BIOL 220L is required.			
<b>BIOL 220L</b>	<b>Anatomy and Physiology I Lab</b>	<b>F&amp;S</b>	<b>1 credit</b>
Concurrent registration in or previous successful completion of BIOL 220 is required. Anatomical structures will be studied at both gross and microscopic levels. Experiments are performed demonstrating fundamental physiological principles.			
<b>BIOL 221</b>	<b>Anatomy and Physiology II</b>	<b>F&amp;S</b>	<b>3 credits</b>
Prerequisite: BIOL 220 and 220L. This is the second of two courses in which discussions of anatomy and physiology are interwoven in an attempt to			

present a unified picture of the structure and function of the organs and systems of the human body. The following systems are examined: endocrine, cardiovascular, lymphatic, immune, respiratory, digestive, urinary, and reproductive. Both gross and microscopic structures are studied. Concurrent registration in, or previous successful completion of BIOL 221L is required.

**BIOL 221L Anatomy and Physiology II Lab F&S 1 credit**

Concurrent registration in or previous successful completion of BIOL 221 is required. Anatomical structures will be studied at both gross and microscopic levels. Experiments are performed demonstrating fundamental physiological principles.

**BIOL 294 Independent Study 1-3 credits**

Independent or directed study of special topics in biology. Department chairperson approval is required.

**BIOL 250 Survey of Tropical Biology SM BD 3 credits**

This course will survey the basic concepts of tropical biology. It will provide the student with a sound foundation in tropical ecosystems and biodiversity. This course will include formal lectures and laboratory field work in a tropical setting. When taken with BIOL 250L, it satisfies a four-credit lab science requirement. The lecture topics will include tropical plant adaptations and defenses, tropical invertebrate and vertebrate diversity and conservation issues. Special emphasis will be given to comparing the differences between tropical areas and temperate zones. This course is intended for any student regardless of major or background and there are no prerequisites. Instructor's approval required for admission. Corequisite: BIOL 250L.

**BIOL 250L Survey of Tropical Biology Lab SM BD 1 credit**

This lab accompanies BIOL 250. The lab will consist of laboratory field work in a tropical setting and experiments designed to help the students better understand tropical biological concepts and techniques. Experiments that will be performed include marking and recapturing spiders, fish species diversity, identification of neotropical moths, population estimates, and more. Corequisite: BIOL 250.

**BIOL 251 Community Ecology Fall 3 credits**

This course will introduce basic ecological concepts; describe the ecological structure, patterns, processes, and interactions of selected ecological communities and their organisms; and discuss human influences to these communities. Travel to specific ecological communities may be required. Corequisite: BIOL 251L.

**BIOL 251L Community Ecology Lab Fall 1 credit**

The laboratory includes fieldwork in selected ecological communities. Students will measure and analyze various biotic and abiotic factors and relate these to observed differences in community structure. Corequisite: BIOL 251.

**BIOL 299 Special Topics BD 1-3 credits**

Repeatable up to six semester hours. An examination of special topics in biology and related fields.

**BIOL 195-295 Service Learning 1-3 credits**

Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

**BIOL 197-297 Cooperative Education/ Internship F&S SM 1-3 credits each**

Repeatable up to a maximum of six hours. Work hours are arranged by employer, adviser and student. Progress is checked by oral and written reports from the employer. Periodic student-adviser conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

## **BOTANY (BOT)**

**BOT 170 Plant Form and Diversity Spring 3 credits**

Botany 170 is designed for the plant lover in all of us – the science major and non-major alike. Topics include the cellular nature of plants; plant structure, anatomy, and physiology; diversity of plants, and fungi; and human uses for plants. Concurrent registration in or previous successful completion of BIOL 170L is required.

**BOT 170L Plant Form and Diversity Lab Spring 1 credit**

Botany 170L is the laboratory to accompany Botany 170. Topics included are the cellular nature of plants; plant structure, anatomy, and physiology; diversity of plants, and fungi; and human uses for plants. Concurrent registration in or previous successful completion of BIOL 170 is required.

## **MICROBIOLOGY (MICR)**

**MICR 202 Introductory Microbiology F&S 3 credits**

This course will include the study of cell structure and physiology of microorganisms, methods of microbial control, specific and nonspecific host defenses, epidemiology, pathogenic microorganisms and the microbiology of food and water. Microorganisms studied will include bacteria, viruses, fungi and protozoa. Concurrent registration in or previous successful completion of MICR 202L is required. Prerequisite (one of the following): BIOL 150, 151, 126, 220 or 221.

**MICR 202L Introductory Microbiology Laboratory F&S 1 credit**

Students will learn basic microbiology techniques and principles as they study the characteristics of representative bacteria and fungi. Concurrent registration in or previous successful completion of MICR 202 is required.

## **BOTANY (BOT)**

SEE BIOLOGY