

# Biology

## Biology

### Program Description

The biology program emphasizes the relationship between structure and function of living systems and the concept that biological processes can be studied at different levels of organization. The program provides a balanced blend of mathematics, chemistry, physics and traditional and modern biology including the advanced topics essential to students continuing their studies at the university. Life is explored at the molecular, cellular, organismal and ecological levels.

### Associate in Science Degree

The Associate in Science Degree can be obtained by completing the 46-50-unit major, the general education requirements, and electives for a total of 65-66 units. All courses in the major must be completed with a grade of C or better or a P if the course is taken on a Pass/No Pass basis.

### Program Outcomes

Students who complete the Biology Associate Degree will be able to:

1. Design and/or interpret an investigation, including data collection and/or analysis.
2. Describe the molecular basis of genetics and energetics.
3. Explain the principles and mechanisms of microevolution and macroevolution.

<b>REQUIRED COURSES</b> . . . . .	<b>Units</b>	PHYS 002 General Physics (Non-Calculus) . . . . .	5
BIO 002 Principles of Cell and Molecular Biology . . . . .	5	AND	
BIO 003 Evolution, Ecology & Biodiversity . . . . .	5	PHYS 004 General Physics (Non-Calculus). . . . .	5
CHEM 001 General Chemistry . . . . .	5	OR	
AND		PHYS 006 Physics for Science and Engineering. . . . .	5
CHEM 002 General Chemistry . . . . .	5	AND	
CHEM 003 Organic Chemistry I . . . . .	5	PHYS 007 Physics for Science and Engineering. . . . .	5
AND		<b>Total Units</b> . . . . .	<b>46 – 50</b>
CHEM 004 Organic Chemistry II . . . . .	5		
MATH 030 Analytic Geometry and Calculus. . . . .	3		
AND			
MATH 031 Analytic Geometry and Calculus. . . . .	3		
OR			
MATH 020 Analytic Geometry and Calculus I . . . . .	5		
AND			
MATH 021 Analytic Geometry and Calculus II. . . . .	5		

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<b>BIO 002</b>	<b>5.0 Units</b>
<b>Principles of Cell and Molecular Biology</b>	

*Prerequisite: CHEM 001. Course Advisory: Eligibility for English 001.* This course introduces biology majors to the basic concepts of cell and molecular biology and to the laboratory techniques used to study cells and biological molecules. Subjects include the structure and function of biological molecules, prokaryotic and eukaryotic cell structure and function, cell physiology and metabolism, Mendelian and molecular genetics, and the techniques used in biotechnology to manipulate DNA. *Three hours lecture, six hours lab.*

<b>BIO 003</b>	<b>5.0 Units</b>
<b>Evolution, Ecology &amp; Biodiversity</b>	

*Prerequisite: MATH 104, BIO 002. Course Advisory: Eligibility for English 001.* This course for biology majors covers evolution, ecology, and the diversity of life. The laboratory component includes invertebrate and vertebrate dissection and several weekend and all day field trips. Students must successfully complete both the lecture and the laboratory portions of the course. Field trips may be required. Some field trips may involve a fee. Formerly BIO 001. *Three hours lecture, six hours lab.*

# Biology

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<b>BIO 004</b> <b>Human Anatomy</b> <i>Course Advisory: Eligibility for English 001 and SCC minimum Math standard, BIO 016 is strongly recommended. BIO 004 is a study of the structural organization of the human body, from cellular to organismal level. Throughout the course, various types of instruction are used, including microscopic investigation of prepared slides of tissues and organs, gross (macroscopic) anatomical dissection, and examination of prosected human material. Formerly BIO 006. C-ID BIOL 110B. Three hours lecture, six hours lab.</i>	<b>5.0 Units</b>	<b>BIO 014</b> <b>Principles of Microbiology</b> <i>Prerequisite: Minimum grade of C in CHEM 051, CHEM 010, or CHEM 001 and a minimum grade of C in MATH 104 or MATH 114 or two years of high school algebra. Course Advisory: SCC minimum English and Math standards. The study of the morphology, physiology, genetics, taxonomy, and ecology of microorganisms. The course also includes principles of immunology, the control of microbes, and their relationship to disease. Laboratory exercises cover microscopy, staining, aseptic techniques, identification, and microbial growth among others. Three hours lecture, three hours lab.</i>	<b>4.0 Units</b>
<b>BIO 005</b> <b>Human Physiology</b> <i>Prerequisite: A minimum grade of C in BIO 004 and CHEM 001 or CHEM 010 or CHEM 051. Course Advisory: SCC minimum English and Math standards. This course describes physiological and homeostatic mechanisms of the body systems in health and disease. The laboratory relates structure to function, uses instrumentation to measure physiological variables, and enables students to critically evaluate functional status. Three hours lecture, six hours lab.</i>	<b>5.0 Units</b>	<b>BIO 015</b> <b>Introduction to Biology</b> <i>Course Advisory: Eligibility for English 001 and SCC minimum Math standard. A non-majors biology course that introduces basic concepts of living organisms including aspects of biological chemistry, cell structure and function, physiology, genetics, evolution, and ecology. Students must successfully complete both the lecture AND lab portions of the course. Off-campus field trips may be required and may involve a fee. NOTE: Not open for credit to students who have completed BIO 001, 002 or 012. Three hours lecture, three hours lab.</i>	<b>4.0 Units</b>
<b>BIO 012</b> <b>Environmental Science</b> <i>Course Advisory: Eligibility for English 001 and SCC minimum Math standard. This course examines the basic concepts of biology (especially ecology), chemistry, and physics to study: (1) human population growth, (2) short and long-term use of resources (such as soil, food, land, renewable and nonrenewable energy, water, and air), and (3) the production of pollution and other wastes. Field trips may be required. Three hours lecture.</i>	<b>3.0 Units</b>	<b>BIO 016</b> <b>Introduction to Human Biology</b> <i>Course Advisory: SCC minimum English and Math standards. An introduction to general biology with emphasis on the human model. Topics include cell structure and function, human evolution, anatomy and physiology, genetics, and the human impact on the environment. This is a course for non-majors. NOTE: Not open for credit to students who have completed BIO 001, 002, 005, 010 or 015. Three hours lecture.</i>	<b>3.0 Units</b>
<b>BIO 012L</b> <b>Environmental Science Laboratory</b> <i>Prerequisite: BIO 012 (may be taken concurrently) Course Advisory: Eligibility for English 001 and SCC minimum Math standard. A course that uses laboratory and mandatory field trip techniques to examine the ecological roles of organisms, resource use, and pollution/waste. Field trips may be required. Three hours lab.</i>	<b>1.5 Units</b>	<b>BIO 016L</b> <b>Human Biology Laboratory</b> <i>Prerequisite: BIO 016 with a minimum grade of C (may be taken concurrently). Course Advisory: Eligibility for English 001 and SCC minimum Math standard. A non-majors laboratory course providing an introduction to general biology with an emphasis on the human model. Topics include microscopy, cell structure and function, human anatomy and physiology, genetics and the human impact on the environment. One half-hour lecture, three hours lab.</i>	<b>1.5 Units</b>

# Biology

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**BIO 018** **3.0 Units**  
**Biology Of Sex**

*Course Advisory: Eligibility for English 001 and SCC minimum Math standard.* The biological bases of human sex and sexuality will be discussed. Emphasis will be placed on the normal and diseased state of the male and female reproductive system. Essay and objective exams as well as written assignments will be used for student evaluations; the final exam will be comprehensive. *Three hours lecture.*

**BIO 019** **4.0 Units**  
**Marine Biology**

*Course Advisory: Eligibility for ENGL 001 and SCC minimum Math standard.* A non-majors course that studies the diversity and natural history of life in the marine environment with an emphasis on the adaptations of organisms to their environment. Students must successfully complete both the lecture and laboratory portions of the course. Field trips may be required. Some field trips may involve a fee. This course is not open for credit to students who have completed BIO 001 or 002. *Three hours lecture, three hours lab.*

**BIO 047** **0.5 to 3.0 Units**  
**Independent Study**

*Prerequisite: Minimum grade of C in 12 units of credit, including 4 units from within the discipline. Course Advisory: Eligibility for English 001; statistics may be useful for data analysis.* Designed for students who intend to major in biological sciences or pre-professional programs. Students may take this course up to the maximum number of units over multiple semesters. *One and one-half to nine hours by arrangement.*

**BIO 048**  
**Special Topics in Biology**

These courses, numbered 048, 098, or 148 depending upon their transferability, are courses of contemporary interest centered on changing knowledge and important issues in the field. Announcements of Special Topics courses appear in the Schedule of Classes.

**BIO 049** **1.0 to 3.0 Units**  
**Biology Honors**

*Prerequisite: Eligibility for Honors Program; BIO 001, BIO 002, BIO 005, BIO 014, or BIO 015 (any of these courses may be taken concurrently). Requires approval of a faculty member sponsor and the Dean of the School of Science and Mathematics. Course Advisory: Eligibility for English 001.* Requires students to complete an independent student project under the supervision of a member of the faculty. The project may be a laboratory or field study or a library study that leads to a thesis. In all cases, the final written product should show integration and synthesis of ideas. Students may take this course up to the maximum number of units over multiple semesters. *Three to nine hours by arrangement.*

**BIO 099** **0.5 to 2.0 Units**  
**Biology Honors: Special Dissection**

*Prerequisites: Completion of 24 units of college credit with a minimum GPA of 3.3; a minimum of 5 units in BIO 004 with a minimum grade of B; an ability to work independently; permission of the School Dean based on instructor availability.* An independent study project designed to increase understanding of human anatomy through detailed dissection and other projects assigned by the supervising instructor. The student will be evaluated through oral examination and evaluation of dissections. This course is an Open Entry/Open Exit course. Students may continue BIO 099 over multiple semesters not to exceed 2 units. *One and one-half to six hours by arrangement.*

**BIO 160** **2.5 Units**  
**Review of Scientific Principles of Pre-Nursing**

*Prerequisite: CONDITION OF ENROLLMENT: Current acceptance or on the waiting list of an RN Program.* This course focuses on science and mathematics topics that are critical to success for students entering an RN program. It provides a clinically pertinent review of select anatomy, physiology, nutrition, and microbiology topics for students entering nursing school. It is especially designed for students that have had an extended time period between finishing their pre-nursing requirements and entering nursing school. This course is taught by a panel of experts in the field. Case studies are extensively used in order to contextualize the material. *This is a Pass/No Pass only course. Ten hours lecture. (4-week course).*