

Biological Science

**BIOLOGICAL SCIENCE – BIOSC**

Diablo Valley College is approved by the California Board of Registered Nurses for continuing education credits (provider #CEP 7992). Biological Science courses that can be used are BIOSC-119, 120, 139, 140 and 146.

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 Biological and Health Sciences Division  
 Physical Sciences Building, Room 263

**Possible career opportunities**

Completion of the biology program prepares students for advanced study leading to careers in government, industry, or secondary-school teaching. The program also partially satisfies the entrance requirements for medical and dental schools. Career options include: researcher, educator, laboratory technician, botanist, ecologist, and field technician.

**Program-level student learning outcomes**

Program learning outcomes are subject to change. The most current list of program learning outcomes for each program is published on the DVC website at [www.dvc.edu/slo](http://www.dvc.edu/slo).

**Associate in science degree  
 Allied health**

Students completing any program will be able to...

- A. illustrate and analyze chemical bonds and reactions.
- B. demonstrate an understanding of the structure and growth of microbes.
- C. demonstrate knowledge of the structure and function of the human body.
- D. demonstrate knowledge of the structure of the human body including both normal and pathological conditions.

The associate in science degree with a major in allied health is a transfer degree for students who wish to transfer to a four-year institution with a major in an allied health field. These fields include, but are not limited to, nursing, radiological sciences, physical therapy, occupational health, and dental hygiene. The degree offers students a broad general education, and provides basic knowledge in microbiology, human anatomy and physiology. These are common prerequisites for above mention four-year majors, while also preparing students for more advanced allied health courses. Degree requirements for four-year programs differ from institution to institution, so students wishing to transfer to a particular four-year program should consult a counselor regarding specific course requirements for that particular program.

The DVC allied health major is intended for transfer. Students wishing to transfer must consult with a counselor regarding other courses in math, chemistry and physics that may be required by the four-year institution to which they intend to transfer. Students who intend to transfer are advised to select General Education Option 2 (IGETC) or Option 3 (CSU GE) Option 1 (DVC General Education) is not generally advised.

To earn an associate in science degree with a major in allied health, students must complete each course used to meet a major requirement with a "C" grade or higher and complete all general education requirements as listed in the catalog. Major requirements may be taken only on a "for grade" basis. Certain courses may satisfy both major and general education requirements; however, the units are only counted once.

<i>major requirements:</i>		<i>units</i>
BIOSC-139	Human Anatomy.....	5
BIOSC-140	Human Physiology .....	5

<i>plus at least 4 units from:</i>		
BIOSC-119	Fundamentals of Microbiology .....	4
BIOSC-146	Principles of Microbiology .....	5

<i>plus at least 4 units from:</i>		
CHEM-107	Integrated Inorganic, Organic and Biological Chemistry .....	5
CHEM-108	Introductory Chemistry .....	4
CHEM-109	Introduction to Organic and Biochemistry .....	4
CHEM-120	General College Chemistry I .....	5
<b>total minimum required units</b>		<b>18</b>

**Associate in science degree  
 Biology**

Students completing any program will be able to...

- A. apply the scientific method of inquiry.
- B. illustrate and analyze chemical bonds and reactions.
- C. compare and contrast organismal life structures and functions.
- D. demonstrate an understanding of the mechanisms and evidence for the theory of evolution.

The associate in science degree with a major in biology is designed as a two-year program that offers a broad general education background and an introduction to the basic principles of biology as well as the supporting knowledge of chemistry needed to fully understand and appreciate biology as specified by the learning objectives of the courses. The courses included in the major are also applicable to further study in the life sciences.

The DVC biology major is intended for transfer. Students wishing to transfer must consult with a counselor regarding other courses in math, chemistry and physics that may be required by the four year institution to which they intend to transfer. Students who intend to transfer are advised to select General Education Option 2 (IGETC) or Option 3 (CSU GE). Option 1 (DVC General Education) is not generally advised.

**Biological science**

To earn an associate in science degree with a major in biology, students must complete each course used to meet a major requirement with a "C" grade or higher and complete all general education requirements as listed in the catalog. Certain courses may satisfy both major and general education requirements; however, the units are only counted once.

<i>major requirements:</i>		<i>units</i>
BIOSC-130	Principles of Cellular and Molecular Biology.....	5
BIOSC-131	Principles of Organismal Biology, Evolution and Ecology.....	5
CHEM-120	General College Chemistry I.....	5
CHEM-121	General College Chemistry II.....	5
<b>total minimum required units</b>		<b>20</b>

**Associate in science degree  
Life science**

Students completing any program will be able to...

- A. understand and apply the scientific method of inquiry.
- B. explain, illustrate and analyze chemical bonds and reactions.
- C. discuss the mechanisms and evidence for the theory of evolution.
- D. understand the molecular aspects of genetics (Cellular Biology emphasis)
- E. discuss interactions of organisms in communities (Field Studies emphasis)
- F. demonstrate knowledge of the structure and function of the human body (Health emphasis).

The associate in science degree with a major in life science is designed as a two-year program that offers a broad general education background and an introduction to the basic principles of biology and the supporting knowledge of chemistry needed to fully understand and appreciate biology. Furthermore, courses in three categories of life science are offered from which students select a minimum of twelve units. These categories emphasize I: health science, II: field sciences and III: cellular and molecular biology.

The associate degree in life science is not designed to transfer as major preparation for a baccalaureate degree. DVC life science students who intend to transfer must consult with a program advisor or counselor to ensure that other major preparation courses in math, chemistry, physics and other transfer requirements at the four-year institutions of their choice are met. Students who intend to transfer are advised to select either General Education Option 2 (IGETC) or Option 3 (CSU GE). General Education Option 1 (DVC General Education) is appropriate for students who do not intend to transfer.

To earn an associate in science degree with a major in life science, students must complete each course used to meet a major requirement with a "C" grade or higher and complete all general education requirements as listed in the catalog. Certain courses may satisfy both major and general education requirements; however, the units are only counted once.

<i>major requirements:</i>		<i>units</i>
<i>complete at least 4 units from:</i>		
BIOSC-102	Fundamentals of Biological Science with Laboratory.....	4
BIOSC-117	Human Biology with Laboratory.....	4
or both		
BIOSC-130	Principles of Cellular and Molecular Biology.....	5
and		
BIOSC-131	Principles of Organismal Biology, Evolution and Ecology.....	5
<i>plus at least 4 units from:</i>		
CHEM-107	Integrated Inorganic, Organic, and Biological Chemistry.....	5
CHEM-109	Introduction to Organic and Biochemistry.....	4
CHEM-120	General College Chemistry I.....	5

*plus at least 12 units from the following areas of specialization; with at least 3 units from each area:*

<b>cellular biology</b>		
BIOSC-107	Genetics and Evolution.....	4
BIOSC-119	Fundamentals of Microbiology.....	4
BIOSC-130	Principles of Cellular and Molecular Biology.....	5
BIOSC-146	Principles of Microbiology.....	5

<b>field studies</b>		
BIOSC-126	Ecology and Field Biology.....	4
BIOSC-131	Principles of Organismal Biology, Evolution and Ecology.....	5
BIOSC-161	Fundamentals of Marine Biology.....	3
BIOSC-162	Fundamentals of Marine Biology with Laboratory.....	4
BIOSC-170	Environmental Science.....	3
BIOSC-171	Environmental Science with Laboratory.....	4
HORT-148L	California Native Plants Laboratory.....	1
OCEAN-101	Fundamentals of Oceanography.....	3
OCEAN-102	Fundamentals of Oceanography with Laboratory.....	4

<b>health</b>		
BIOSC-120	Introduction to Human Anatomy and Physiology.....	5
BIOSC-139	Human Anatomy.....	5
BIOSC-140	Human Physiology.....	5
NUTRI-160	Nutrition: Science and Applications.....	3

**total minimum required units 20**

**Associate in science degree  
Natural science**

Students completing any program will be able to...

- A. understand and apply scientific terminology appropriate for this specific field of life or physical science.
- B. understand and apply the method of scientific inquiry appropriate for this specific field of life or physical science.
- C. collect and/or analyze laboratory and/or field data appropriate for the specific field of life or physical science.
- D. critically evaluate scientific information in various formats.
- E. understand the relationship between humans and the physical and/or life sciences.

# DIABLO VALLEY COLLEGE CATALOG 2017-2018

any updates to this document can be found in the addendum at [www.dvc.edu/communication/catalog](http://www.dvc.edu/communication/catalog)

## Biological science

The associate in science degree in natural science is designed as a two-year program that offers a broad general education background and an introduction to the diverse field of the natural sciences. This degree is an appropriate choice for students who seek breadth in their knowledge of the sciences or for those starting their preparation for a career in elementary education (multi subject), secondary education (single subject), journalism, liberal arts, environmental sciences, etc. Students may transfer to a science-related major or career/technical program or may work in a science-related field.

This degree, however, is not designed to present the complete lower division preparation for a major in a traditional scientific field. DVC natural sciences students who intend to transfer must consult with a program advisor or counselor to ensure that other major preparation courses such as mathematics and other transfer requirements at the four-year institutions of their choice are met. Students who intend to transfer are advised to select either General Education Option 2 (IGETC) or Option 3 (CSU GE). General Education Option 1 (DVC General Education) is appropriate for students who do not intend to transfer.

To earn an associate in science degree in natural sciences, students must complete each course used to meet a major requirement with a "C" grade or higher and complete all general education requirements as listed in the catalog. Certain courses may satisfy both major and general education requirements; however the units are only counted once.

*Major requirements - Students will select 18 units total from courses in the biological sciences and physical sciences:*

### biological science

*minimum of 6 units required (four of the six units must be from IGETC approved courses that include a laboratory):*

	<i>units</i>
BIOSC-101 Fundamentals of Biological Science .....	3
BIOSC-102 Fundamentals of Biological Science with Laboratory .....	4
BIOSC-107 Genetics and Evolution .....	4
BIOSC-116 Human Biology .....	3
BIOSC-117 Human Biology with Laboratory .....	4
BIOSC-119 Fundamentals of Microbiology .....	4
BIOSC-120 Introduction to Human Anatomy and Physiology .....	5
BIOSC-126 Ecology and Field Biology .....	4
BIOSC-130 Principles of Cellular and Molecular Biology....	5
BIOSC-131 Principles of Organismal Biology, Evolution and Ecology.....	5
BIOSC-139 Human Anatomy.....	5
BIOSC-140 Human Physiology .....	5
BIOSC-146 Principles of Microbiology .....	5
BIOSC-161 Fundamentals of Marine Biology .....	3
BIOSC-162 Fundamentals of Marine Biology with Laboratory .....	4
BIOSC-170 Environmental Science .....	3
BIOSC-171 Environmental Science with Laboratory.....	4
HORT-110 Introduction to Horticulture and Plant Science ...	4
HORT-148L California Native Plants Laboratory.....	1
NUTRI-160 Nutrition: Science and Applications .....	3

### physical science

*minimum of 6 units required (four of the six units must be from IGETC approved courses that include a laboratory):*

	<i>units</i>
ASTRO-110 The Visible Universe.....	3
ASTRO-120 Elementary Astronomy.....	3
ASTRO-128 The Universe for Beginners .....	4
ASTRO-130 Astronomy Laboratory .....	1
ASTRO-298 Independent Study.....	0.5-3
CHEM-106 Chemistry for Non-Science Majors .....	4
CHEM-107 Integrated Inorganic, Organic, and Biological Chemistry .....	5
CHEM-108 Introductory Chemistry .....	4
CHEM-109 Introduction to Organic and Biochemistry .....	4
CHEM-120 General College Chemistry I .....	5
CHEM-121 General College Chemistry II.....	5
CHEM-226 Organic Chemistry I .....	5
CHEM-227 Organic Chemistry II .....	5
CHEM-298 Independent Study.....	0.5-3
GEOG-120 Physical Geography .....	3
GEOG-121 Physical Geography Laboratory .....	1
GEOG-125 Introduction to Geographic Information Systems (GIS).....	3
GEOG-126 Advanced Geographic Information Systems ...	3
GEOG-140 Introduction to Weather .....	3
GEOG-141 Introduction to Weather Laboratory .....	1
GEOG-160 Introduction to Remote Sensing.....	4
GEOG-162 Map Design and Visualization.....	3
GEOG-298 Independent Study.....	0.5-3
GEOL-120 Physical Geology.....	3
GEOL-121 Earth and Life Through Time .....	3
GEOL-122 Physical Geology Laboratory.....	1
GEOL-124 Earth and Life Through Time Laboratory .....	1
GEOL-125 Geology of California .....	3
GEOL-298 Independent Study.....	0.5-3
OCEAN-101 Fundamentals of Oceanography .....	3
OCEAN-102 Fundamentals of Oceanography with Laboratory .....	4
PHYS-110 Elementary Physics.....	3
PHYS-111 Physics Laboratory .....	1
PHYS-113 Elementary Modern Physics: From Atoms to the Big Bang.....	3
PHYS-120 General College Physics I.....	4
PHYS-121 General College Physics II.....	4
PHYS-124 Calculus Supplement for Physics 120 .....	0.5
PHYS-125 Calculus Supplement for Physics 121 .....	0.5
PHYS-129 Introductory Physics for Engineers .....	4
PHYS-130 Physics for Engineers and Scientists A: Mechanics and Wave Motion.....	4
PHYS-230 Physics for Engineers and Scientists B: Heat and Electro-Magnetism .....	4
PHYS-231 Physics for Engineers and Scientists C: Optics and Modern Physics.....	4
PHYS-112 Fundamentals of Physical Science.....	3
PHYS-298 Independent Study.....	0.5-3

**total minimum units for the major 18**

**Biological science**

**Associate in science in biology for transfer**

Students completing any program will be able to...

- A. apply the scientific method of inquiry using appropriate and effective tools in obtaining, analyzing (including use of statistical procedures and standard techniques in data gathering), and interpreting information including peer-reviewed articles.
- B. illustrate and analyze chemical bonds and reactions starting on the level of subatomic particles to the level of large organic molecules.
- C. compare and contrast organismal life structures and functions including microorganisms.
- D. demonstrate an understanding of the mechanisms and evidence for the theory of evolution.
- E. demonstrate the concept of limits and apply limits to real-world problems.
- F. solve problems involving rates of change and derivatives, including real-world problems.
- G. explain the core concepts in mechanics; forces, motion, momentum and energy.
- H. solve simple circuit problems involving electric potential, capacitance and resistance.

The associate in science in biology for transfer degree is designed as a two-year program that offers an introduction to the basic principles of biology as well as the supporting knowledge of chemistry, physics, and mathematics.

The associate in science in biology for transfer is intended for students who plan to complete a bachelor's degree in a similar major at a CSU campus. Students completing this degree are guaranteed admission to the CSU system, but not to a particular campus or major.

In order to earn the degree, students must:

- Complete 60 semester CSU-transferable units.
- Complete the California State University-General Education pattern (CSU GE); or the Intersegmental General Education Transfer Curriculum (IGETC) pattern.
- Complete a minimum of 18 semester units in the major.
- Obtain of a minimum grade point average (GPA) of 2.0.
- Earn a grade of "C" or higher in all courses required for the major.

Students transferring to a CSU campus that accepts the degree will be required to complete no more than 60 units after transfer to earn a bachelor's degree. This degree may not be the best option for students intending to transfer to a particular CSU campus or to a university or college that is not part of the CSU system, or those students who do not intend to transfer.

Students must complete each course used to meet a major requirement with a "C" grade or higher. Some courses in the major satisfy both major and CSUGE/IGETC general education requirements; however, the units are only counted once toward the 60 unit requirement for an associate degree. Students are advised that for this major, they may use the IGETC for STEM (Science, Technology, Engineering and Mathematics) pattern. This pattern allows students to complete one course in Area 3A; one course in Area 3B; and two courses in Area 4 from two different disciplines. Some variations in major requirements may exist at certain four-year institutions; therefore, students who intend to transfer are advised to refer to the catalog of the prospective transfer institution and consult a counselor.

<i>required courses:</i>		<i>units</i>
BIOSC-130	Principles of Cellular and Molecular Biology....	5
BIOSC -131	Principles of Organismal Biology, Evolution and Ecology.....	5
CHEM-120	General College Chemistry I.....	5
CHEM-121	General College Chemistry II.....	5
<i>plus at least 4 units from:</i>		
MATH-182	Calculus for Management, Life Science and Social Science I.....	4
MATH-192	Analytic Geometry and Calculus I.....	5
<i>plus at least 8 units from:</i>		
PHYS-120	General College Physics I.....	4
PHYS-121	General College Physics II.....	4
or		
PHYS-130	Physics for Engineers and Scientists A: Mechanics and Wave Motion.....	4
PHYS-230	Physics for Engineers and Scientists B: Heat and Electro-Magnetism.....	4
<i>plus at least 3 units from:</i>		
BIOSC-119	Fundamentals of Microbiology.....	4
BIOSC-146	Principles of Microbiology.....	5
CHEM-226	Organic Chemistry I.....	5
MATH-142	Elementary Statistics with Probability.....	4
PSYCH-101	Introduction to Psychology.....	3
<b>total minimum required units</b>		<b>35</b>

**Certificate of achievement Allied health**

Students completing any program will be able to...

- A. illustrate and analyze chemical bonds and reactions.
- B. demonstrate an understanding of the structure and growth of microbes.
- C. demonstrate knowledge of the structure and function of the human body.
- D. demonstrate knowledge of the structure of the human body including both normal and pathological conditions.

This program prepares the student for entry into some health professional programs or jobs in the medical field that do not require degrees. These courses provide some of the prerequisites for advanced training in the medical field for such occupations as nursing, dental hygiene, physical therapy, occupational therapy, medical laboratory technician, and radiological sciences.

**Biological Science**

To earn a certificate of achievement, students must complete the required courses with a "C" grade or higher. Course requirements are typically available in the day and evening. Students may also earn an associate in science degree in allied health.

Students who intend to transfer to a four-year program should consult with a counselor regarding course and program requirements.

<i>required courses:</i>	<i>units</i>
BIOSC-139 Human Anatomy.....	5
BIOSC-140 Human Physiology .....	5

<i>plus at least 4 units from:</i>	
BIOSC-119 Fundamentals of Microbiology .....	4
BIOSC-146 Principles of Microbiology .....	5

<i>plus at least 4 units from:</i>	
CHEM-107 Intergrated Inorganic, Organic and Biological Chemistry .....	5
CHEM-108 Introductory Chemistry .....	4
CHEM-109 Introduction to Organic and Biochemistry .....	4
CHEM-120 General College Chemistry I.....	5

**total minimum required units 18**

**Certificate of achievement  
Allied health fundamentals**

Students completing any program will be able to...

- A. demonstrate an understanding of the structure and growth of microbes.
- B. demonstrate knowledge of the structure and function of the human body.
- C. demonstrate knowledge of changes in bodily functions as a result of disease and determine the reason for functional changes.
- D. analyze chemical reactions.

This program prepares the student for entry into some health professional programs or jobs in the medical field that do not require degrees. These courses provide some of the prerequisites for advanced training in the medical field for such occupations as nursing, dental hygiene, physical therapy, occupational therapy, medical laboratory technician, and radiological sciences.

To earn a certificate of achievement, students must complete the required courses with a "C" grade or higher. Course requirements are typically available in the day and evening. Students may also earn a certificate of achievement in allied health or an associate in science degree in allied health.

Students who intend to transfer to a four-year program should consult with a counselor regarding course and program requirements.

<i>required course:</i>	<i>units</i>
BIOSC-120 Introduction to Human Anatomy and Physiology .....	5

<i>plus at least 4 units from:</i>	
BIOSC-119 Fundamentals of Microbiology .....	4
BIOSC-146 Principles of Microbiology .....	5

*plus at least 4 units from:*

CHEM-107 Intergrated Inorganic, Organic and Biological Chemistry .....	5
CHEM-108 Introductory Chemistry .....	4
CHEM-109 Introduction to Organic and Biochemistry .....	4
CHEM-120 General College Chemistry I.....	5

**total minimum required units 13**

**BIOSC-101 Fundamentals of Biological Science**

3 units SC

- 54 hours lecture per term
- Recommended: Eligibility for ENGL-122 or equivalent
- Note: Students who have successfully completed BIOSC-102 should not enroll in BIOSC-101. Students who have successfully completed BIOSC-102 will not receive credit for BIOSC-101.

In this course students will explore fundamental biological principles including the process of evolution by means of natural selection, cell structure and function, plant and animal growth and development, reproduction, genetics and homeostasis within and among living things, populations and communities. CSU, UC (credit limits may apply to UC - see counselor)

**BIOSC-102 Fundamentals of Biological Science with Laboratory**

4 units SC

- 54 hours lecture/54 hours laboratory per term
- Recommended: Eligibility for ENGL-122 or equivalent
- Note: Students who have successfully completed BIOSC-101 should not enroll in BIOSC-102. Students who have successfully completed BIOSC-101 will not receive credit for BIOSC-102.

In this course students will explore fundamental biological principles including the process of evolution by means of natural selection, cell structure and function, plant and animal growth and development, reproduction, genetics and homeostasis within and among living things, populations and communities. A laboratory component is included that introduces scientific method and experimentation, including data gathering and analysis with a variety of scientific equipment. CSU, UC (credit limits may apply to UC - see counselor)

**Biological science****BIOSC-107 Genetics and Evolution**

4 units SC

- 54 hours lecture/54 hours laboratory per term
- Recommended: Eligibility for ENGL-122 or equivalent

This course presents the study of various aspects of genetics and evolution. Topics include cellular reproduction, Mendelian Genetics, DNA structure and function, protein synthesis, gene regulation, biotechnology, genetically-modified organisms and gene therapy as well as an introduction to the process of evolution by means of natural selection and the social implications of these topics. The laboratory component includes an introduction to the scientific method and experimentation including data gathering and analysis with a variety of scientific equipment. Laboratory activities will include manipulating DNA, conducting genetic crosses and constructing cladograms. CSU, UC

**BIOSC-116 Human Biology**

3 units SC

- 54 hours lecture per term
- Recommended: Eligibility for ENGL-122 or equivalent
- Note: Not open to students who have taken BIOSC-117, 120, 139, or 140

The broad concepts and principles of biology as applied to humans. Topics include human evolution, ecology, human genetics, DNA structure and function, disease factors, nutrition and metabolism, growth and development and a survey of body systems. CSU, UC (credit limits may apply to UC - see counselor)

**BIOSC-117 Human Biology with Laboratory**

4 units SC

- 54 hours lecture/54 hours laboratory per term
- Recommended: Eligibility for ENGL-122 or equivalent
- Note: Not open to students who have taken BIOSC-116, 120, 139, or 140

The basic principles of biology will be covered, especially as they pertain to humans. Topics include cell structure, function and reproduction, human heredity, structure and function of a variety of human organ systems, ecology and evolution. A laboratory component is included that introduces the scientific method and experimentation, including data gathering and analysis with a variety of scientific equipment. CSU, UC (credit limits may apply to UC - see counselor)

**BIOSC-119 Fundamentals of Microbiology**

4 units SC

- 54 hours lecture/54 hours laboratory per term
- Prerequisite: CHEM-108 or CHEM-109 or CHEM-120 or equivalent
- Recommended: High school or college biology or chemistry; eligibility for ENGL-122; and MATH-120 or equivalents

Fundamentals of microbiology with an emphasis on microbiology as it pertains to the allied health professions. Topics include: microscopy, cell structure and function, aseptic technique, culture and control of microbes, metabolism, microbial genetics and biotechnology, medical microbiology and immunology, and microbes in the environment. CSU, UC (credit limits may apply to UC - see counselor)

**BIOSC-120 Introduction to Human Anatomy and Physiology**

5 units SC

- 54 hours lecture/54 hours laboratory per term
- Recommended: High school or college biology or chemistry and eligibility for ENGL-122 or equivalents

The structure and function of the human body stressing the levels of organization within the body, relationship between structure and function, and importance of maintaining relatively stable internal conditions for health and some health consequences resulting from loss of this stability. Hands-on laboratory work including microscopy, experiments, and dissection (including cadavers) reinforces the lecture material. CSU, UC (credit limits may apply to UC - see counselor)

**BIOSC-126 Ecology and Field Biology**

4 units SC

- 54 hours lecture/54 hours laboratory per term
- Recommended: Eligibility for ENGL-122 or equivalent

This course is designed for non-majors and presents the principles of ecology, natural selection, speciation and biodiversity. During field laboratories, students will survey the natural history of ecological communities in northern California to identify dominant plant and animal species in each community and explore the influences of the physical environment on the evolutionary adaptations and ecology of the species. Human impacts on ecological systems and conservation issues are explored. CSU, UC

**Biological Science****BIOSC-130 Principles of Cellular and Molecular Biology**

5 units SC

- 54 hours lecture/108 hours laboratory per term
- Prerequisite: CHEM-120 or equivalent
- Recommended: BIOSC-101 or BIOSC-102 and eligibility for ENGL-122 or equivalents

This course is formed around the universal biological processes of all organismal life with an emphasis on the cellular level of organization and is intended for biology majors or other students with an in-depth interest in the biological sciences. Topics include principles of biomolecules, prokaryotic and eukaryotic cellular morphology and ultrastructure, biochemical pathways (photosynthesis and cellular respiration), enzymes, cellular communication and reproduction, classical and molecular genetics, gene control, embryology, immunology, and selected topics of animal physiology emphasizing homeostatic control mechanisms. The laboratory component focuses on methodologies necessary for analyzing molecular, cellular and genetic problems like microscopy, spectrophotometry, graphing and statistical analysis, as well as recombinant DNA technologies. BIOSC-130+BIOSC-131=C-ID BIOL 135S, CSU, UC

**BIOSC-131 Principles of Organismal Biology, Evolution and Ecology**

5 units SC

- 54 hours lecture/108 hours laboratory per term
- Prerequisite: CHEM-120 (may be taken concurrently) or equivalent
- Recommended: BIOSC-101 or 102, BIOSC-130 and eligibility for ENGL-122 or equivalents
- Note: It is strongly recommended to take BIOSC-130 before BIOSC-131. BIOSC-131 requires strong written and oral English language skills.

This course is formed around three main biological principles: evolution, unity/diversity of life, and ecology and is intended for biology majors or other students with an in-depth interest in the biological sciences. The focus is on universal biological processes with emphasis on the whole organism and higher levels of organization. Evidence and mechanisms of evolution and speciation; evolutionary history and diversity of life; structure, function and evolutionary adaptations of organisms (including plants, fungi, animals, and unicellular organisms); general, population and community ecology; ecosystems and environmental concerns are covered. In laboratory, students will explore these themes with hands-on observations, dissections, laboratory activities and field exercises. BIOSC-130+BIOSC-131=C-ID BIOL 135S, CSU, UC

**BIOSC-139 Human Anatomy**

5 units SC

- 54 hours lecture/108 hours laboratory per term
- Recommended: BIOSC-102 and eligibility for ENGL-122 or equivalents

The physical structure of the human body as an integrated unit is studied stressing normal structure and the changes that occur with aging and disease. The course content is appropriate for majors in physical and health education; nursing; physical, occupational and respiratory therapy; paramedical; nurse practitioner and physician assistant programs. Gross anatomy will be studied primarily through cadaver dissection in conjunction with preserved specimens, student self-reference, models and charts. Microscopic anatomy (histology) will be studied mainly through the use of microscope slides. C-ID BIOL 110B, CSU, UC (credit limits may apply to UC - see counselor)

**BIOSC-140 Human Physiology**

5 units SC

- 54 hours lecture/108 hours laboratory per term
- Prerequisite: BIOSC-120 or BIOSC-139 or equivalent. CHEM-107, 108, 109 or 120 or one year of high school chemistry or equivalents
- Recommended: BIOSC-102, eligibility for ENGL-122, and MATH-120 or equivalents
- Note: This course is primarily intended for Nursing, Allied Health, Dental Hygiene, Kinesiology, and other health related majors.

This course presents the essential concepts of physiological mechanisms of the human body. Emphasis will be given to regulatory mechanisms ranging from the cellular level to organ-system level employing chemical, mathematical and physical principles. Topics of study will include physiological principles, function, integration and homeostasis of the human body at the cellular, tissue, organ, organ system and organismal level. Laboratory activities focus on methodologies necessary for the application, analysis and evaluation of major physiological principles using molecular technologies, bioelectronics, computer analysis, and/or live organisms. C-ID BIOL 120B, CSU, UC (credit limits may apply to UC - see counselor)

**BIOSC-146 Principles of Microbiology**

5 units SC

- 54 hours lecture/108 hours laboratory per term
- Prerequisite: CHEM-108 or CHEM-109 or CHEM-120 or equivalent
- Recommended: Eligibility for ENGL-122 and MATH-120 or equivalents

Topics include microscopy, culture of microbes and aseptic technique, control and identification of microbes, bacterial biochemistry, metabolism and physiology, cell structure and function, microbial genetics, recombinant DNA and biotechnology, viruses and their life cycles, immunology, epidemiology and study of select infectious diseases. CSU, UC (credit limits may apply to UC - see counselor)

**Biological Science****BIOSC-150 Topics in Biology**

.3-4 units SC

- *Variable hours*

A supplemental course in biology to provide a study of current concepts and problems in biology and related subdivisions. Specific topics will be announced in the schedule of classes. CSU

**BIOSC-161 Fundamentals of Marine Biology**

3 units SC

- *54 hours lecture per term*
- *Recommended: Eligibility for ENGL-122 or equivalent*
- *Note: This course does not include a laboratory. Students requiring or wanting a laboratory to accompany this course should enroll in BIOSC-162. Students who have successfully completed BIOSC-162 should not enroll in BIOSC-161. Students who have successfully completed BIOSC-162 will not receive credit for BIOSC-161.*

This course is an introduction to the diversity of marine organisms, the environments in which they live, and the relationships between species and organisms with their environments. Topics will include: the scientific method and its utilization in the marine sciences; properties of the marine environment; marine organisms (including their diversity and evolutionary adaptations; marine ecosystems with a focus on local estuarine and coastal environs; marine ecology;) and the sustainable use of marine biological resources. CSU, UC (credit limits may apply to UC - see counselor)

**BIOSC-162 Fundamentals of Marine Biology with Laboratory**

4 units SC

- *54 hours lecture/54 hours laboratory per term*
- *Recommended: Eligibility for ENGL-122 or equivalent*
- *Note: Students who have successfully completed BIOSC-161 should not enroll in BIOSC-162. Students who have successfully completed BIOSC-161 will not receive credit for BIOSC-162. This course will include field trips outside of regularly scheduled class time. Formerly BIOSC-160.*

This course is an introduction to marine organisms, marine environments, and the ecological relationships that exist between them. Lecture topics will include: the scientific method and its utilization in the marine sciences; physical, chemical and geological properties of the marine environment; marine organisms (including their taxonomic classification, diversity and evolutionary adaptations); marine ecosystems; marine ecology. Laboratory topics will include: observation and dissection of representative marine organisms; and inquiry based comparison of organisms in different phyla and from different habitats. CSU, UC (credit limits may apply to UC - see counselor)

**BIOSC-170 Environmental Science**

3 units SC

- *54 hours lecture per term*
- *Recommended: BIOSC-101 or 102; eligibility for ENGL-122 or equivalents*
- *Note: Students who have successfully completed BIOSC-171 should not enroll in BIOSC-170. Students who have successfully completed BIOSC-171 will not receive credit for BIOSC-170.*

This is an introductory course designed to expose students to environmental science. Human interactions with the environment and their consequences for living and nonliving systems will be examined. Topics will include evolution, ecology, biodiversity, human population dynamics, natural resource use, pollution, environmental degradation, climate change, marine and freshwater resources, and environmental policy. CSU, UC (credit limits may apply to UC - see counselor)

**BIOSC-171 Environmental Science with Laboratory**

4 units SC

- *54 hours lecture/54 hours laboratory per term*
- *Recommended: BIOSC-101 or BIOSC-102 or equivalent; eligibility for ENGL-122 or equivalent*
- *Note: Students who have successfully completed BIOSC-170 should not enroll in BIOSC-171. Students who have successfully completed BIOSC-170 will not receive credit for BIOSC-171. Class field trips will be organized to local sites related to course topics.*

This is an introductory course designed to expose students to environmental science. Human interactions with the environment and their consequences for living and nonliving systems will be examined. Topics will include evolution, ecology, biodiversity, human population dynamics, natural resource use, pollution, environmental degradation, climate change, marine and freshwater resources, and environmental policy. The laboratory component will introduce the scientific method, including experimental design, sampling methods, data collection and analysis techniques, as well as representing those data in graphical form. CSU, UC (credit limits may apply to UC - see counselor)

**BIOSC-299 Student Instructional Assistant**

.5-3 units SC

- *Variable hours*
- *Note: Applications must be approved through the Instruction Office. Students must be supervised by a DVC instructor.*

Students work as instructional assistants, lab assistants and research assistants in this department. The instructional assistants function as group discussion leaders, meet and assist students with problems and projects, or help instructors by setting up laboratory or demonstration apparatus. Students may not assist in course sections in which they are currently enrolled. CSU