BIOLOGY

PROGRAMS

- **Associate in Science for Transfer (A.S.-T)**
- **Associate of Science (A.S.)**

HARTNELL COLLEGE

DESCRIPTION

The Biology program offers degrees that are intended to create interest and enrichment through the study of living organisms and the basic biological principles. The major courses provide a strong background in the biological sciences for students transferring to four-year institutions who are interested in careers such as agriculture, health, research, and teaching.

The Biology program offers two associate degrees: The AS degree (associate degree in biological sciences) and the AS-T degree (associate degree in biological sciences for transfer). The AS degree does not require calculus, but includes other mathematics courses that meet transfer requirements for certain institutions. The AS-T provides a clearly articulated curriculum, including first-semester calculus, for students who wish to transfer to baccalaureate degree programs at California State University (CSU) campuses.

Baccalaureate programs in biology include a wide array of specialties including but not limited to: animal or plant science, biochemistry, bioinformatics, cell and molecular biology, environmental biology, human biology, and microbiology. The preparation for different specialties will vary. For detailed requirements for individual programs at four-year institutions, students should contact the transfer institution and/or meet with a counselor for specific transfer course requirements in their major.

LEADS TO CAREER OPPORTUNITIES SUCH AS:

- Animal Scientist
- Biologist
- Botanist
- Ecologist
- Environmental Scientist
- Natural Resource Manager
- Nature Conservationist
- Public Health Worker
- Research/Professor
- Water Quality Technician
- Wildlife Biologist
- Wildlife Resource Worker

TRANSFER PREPARATION

Courses that fulfill major requirements for an associate degree may differ from those needed to prepare for transfer. Students who plan to transfer to a four-year college or university should schedule an appointment with a Hartnell College counselor to develop a student education plan before beginning their program.

TRANSFER RESOURCES

www.ASSIST.org – CSU and UC Articulation Agreements and Major Search Engine

CSU System Information - http://www2.calstate.edu

FINANCIAL AID

Paying for the cost of a college education requires a partnership among parents, students and the college. As the cost of higher education continues to rise we want you to know that Hartnell College offers a full array of financial aid programs, federal loan programs, and fee waivers.

https://www.hartnell.edu/students/fa/net-price-calculator.html

BIOLOGY FOR TRANSFER (AST.BIO)

ASSOCIATE IN SCIENCE FOR TRANSFER

Program Outcomes: Upon successful completion of this program a student will be able to:

- apply the scientific method to problem solving, devising a research plan, and evaluating data and findings.
- describe the structure and function of biological molecules, cells and organelles, and tissues and organ systems of plants and animals.
- apply the principles of heredity at the molecular, cellular, and organismal levels.
- explain the mechanism and evidence of evolution through natural selection.
- apply taxonomic principles to the classification of organisms.
- describe the flow of energy within organisms and within ecosystems.

Required Major Courses (29 units)

☐ BIO-1 – Fundamental Biological Concepts	5.0
☐ BIO-2 – General Zoology	5.0
☐ BIO-3 – General Botany	5.0
☐ CHM-1A – General Chemistry I	5.0
☐ CHM-1B – General Chemistry II	5.0
☐ MAT-3A – Analytic Geometry and Calculus I	4.0

Required Courses (Select 1 series 8 units)

☐ PHY-2A – College Physics I	4.0
AND	
PHY-2B – College Physics II	4.0
OR	
☐ PHY-4A – General Physics I/Mechanics	4.0
AND	
PHY-4B – General Physics II/Electricity and Magnetism	4.0

Recommended Major Electives (None Required)

☐ CHM-12A – Organic Chemistry I	5.0
☐ CHM-12B – Organic Chemistry II	5.0
☐ MAT-13 – Elementary Statistics	4.0
☐ MAT-3B – Analytic Geometry and Calculus II	4.0
☐ MAT-3C – Analytic Geometry and Calculus III	4.0

SUBTOTAL: 37 UNITS

General Education – Required Courses

Students must complete one of the following General Education Plans:

CSU-GE for STEM *(see page 72)* **33 units**

IGETC for STEM *(see page 74)* **31 units**

Students can double-count required courses and courses for General Education

■ ***Electives (Courses Numbered 1-99) required when degree units plus GE units total fewer than 60.***

TOTAL: 60 UNITS

A DegreeWithA Guarantee.com℠
Associate Degree for Transfer

In order to earn this degree, students must complete the Associate Degree for Transfer Requirements:

1. Completion of 60 semester units or 90 quarter units that are eligible for transfer to the California State University, including both of the following:
   a. The Intersegmental General Education Transfer Curriculum (IGETC) or the California State University GE – Breadth Requirements (CSU GE-Breadth).
   b. A minimum of 18 semester units or 27 quarter units in a major or area of emphasis, as determined by the community college district.
2. Obtainment of a minimum grade point average of 2.0

ADTs include (AA-T) and (AS-T) degrees. The law authorizing these degrees also requires that students must earn a "C" or better in all courses required for the major or area of emphasis. A "P" (Pass) grade is also an acceptable grade for courses in the major if the course is taken on a Pass/No Pass basis.

BIOLOGY (AS.BIO)

ASSOCIATE OF SCIENCE

Program Outcomes: Upon successful completion of this program a student will be able to:

- apply the scientific method to problem solving, devising a research plan, and evaluating data and findings.
- describe the structure and function of biological molecules, cells and organelles, and tissues and organ systems of plants and animals.
- apply the principles of heredity at the molecular, cellular, and organismal levels.
- explain the mechanism and evidence of evolution through natural selection.
- apply taxonomic principles to the classification of organisms.
- describe the flow of energy within organisms and within ecosystems.

Required Major Courses (33 units)

☐ BIO-1 – Fundamental Biological Concepts	5.0
☐ BIO-2 – General Zoology	5.0
☐ BIO-3 – General Botany	5.0
☐ CHM-1A – General Chemistry I	5.0
☐ CHM-1B – General Chemistry II	5.0
☐ MAT-13 – Elementary Statistics	4.0
☐ MAT-25 – Pre-Calculus	4.0

Major Electives (Select 1 series 8-12 units)

☐ PHY-2A/2B – College Physics I & II	8.0
☐ PHY-4A/4B/4C – General Physics I, II, III	12.0

Recommended Major Electives (None Required)

☐ CHM-12A – Organic Chemistry I	5.0
☐ CHM-12B – Organic Chemistry II	5.0
☐ MAT-3A – Analytic Geometry and Calculus I	4.0
☐ MAT-3B – Analytic Geometry and Calculus II	4.0
☐ MAT-3C – Analytic Geometry and Calculus III	4.0

SUBTOTAL: 41-45 UNITS

General Education – Required Courses

Students must complete one of the following General Education Plans:

HCCD GE *(see page 68) MAT-13 and MAT-25*

☐ **Natural Sciences** ☐ **Social & Behavioral Sciences** ☐ **Humanities**
☐ **Ethnic Groups in the US** ☐ **Language and Rationality**

SUBTOTAL: 21 UNITS

Students can double-count required courses and courses for General Education

■ ***Electives (Courses Numbered 1-199) required when degree units plus GE units total fewer than 60.***

TOTAL: 62-66 UNITS