

# UNIVERSITY STUDIES - MATHEMATICS AND NATURAL SCIENCE AND COMPUTER SCIENCE (AS)

The Associate Degree in University Studies is intended to accommodate the differing requirements of a wide variety of transfer institutions and major options. Because admission and major preparation requirements vary at each four-year transfer institution, courses used to complete this degree should be selected with the assistance of a counselor.

The completion of the University Studies Degree does not guarantee acceptance into either a baccalaureate major or a four-year institution.

## Requirements

### I. California State University (CSU) General Education Breadth

1. Complete CSU General Education Breadth (see Transfer Information and Degree Requirements in college catalog).
2. Earn a grade of "C" or higher or "Pass" for all courses in Area A and the Mathematical/Quantitative Reasoning courses in Area B.
3. Complete a minimum of 18 units (listed below) with a "C" grade or higher or "Pass".
4. Complete a minimum of 60 degree applicable CSU transferable semester units. (All courses included in each area of emphasis are CSU transferable.)
5. Earn a cumulative GPA of 2.0 in all college coursework completed.
6. Meet Grossmont College residence requirements for graduation (see Degree Requirements in college catalog).
7. Students pursuing a University Studies degree in Mathematics and Natural Science and Computer Science are eligible to use CSU for STEM to fulfill the general education requirements of this degree.

or

### II. Intersegmental General Education Transfer Curriculum (IGETC) for CSU or UC

1. Complete IGETC Certification (see Transfer Information and Degree Requirements in college catalog).
2. Earn a grade of "C" or higher or "Pass" in all IGETC courses.
3. Complete a minimum of 18 units (listed below) with a "C" grade or higher or "Pass".
4. Complete a minimum of 60 degree applicable UC transferable semester.  
**Courses that are non-UC transferable are indicated by (\*).**  
Additional UC transferable units may be chosen as electives.
5. Earn a cumulative GPA of 2.0 in all college coursework completed.
6. Meet Grossmont College residence requirements for graduation (see Degree Requirements in college catalog).
7. Students pursuing a University Studies degree in Mathematics and Natural Science and Computer Science are eligible to use IGETC for STEM to fulfill the general education requirements of this degree.

While 18 units are required in a specific area to meet the requirements of the degree, it is strongly recommended that as many lower division preparation for the major courses as possible be completed at the community college prior to transfer. Cross-listed courses receive credit for only one course. Some baccalaureate majors and four-year institutions require a higher GPA than is necessary for the Associate Degree. Completion of the University Studies Degree does not guarantee admission to a four-year institution.

**The Program-level Student Learning Outcomes (PSLOs)** are outcomes that students who complete a degree/certificate in this program will be able to achieve upon degree/certificate completion. The PSLOs for the University Studies degree in **Mathematics, Natural Science, and Computer Science** are:

1. Solve complex problems using mathematics, natural and/or computer science.
2. Utilize high level mathematical skills to analyze data and/or solve problems.
3. Analyze concepts of physical and biological science to evaluate scientific information and solve scientific problems.

Courses in this major focus on the study of mathematical and quantitative reasoning skills and apply the facts and principles that form the foundations of living and non-living systems. Students recognize and utilize the methodologies of science as investigative tools, as well as the limitations of science. Students use basic mathematical skills to solve numerical problems encountered in daily life, and more advanced skills for applications in the physical and life sciences. Students completing this area may be interested in the following baccalaureate majors: astronomy, biological sciences, chemistry, computer science, engineering, geography, geology, mathematics, oceanography, physical science, and physics. **Students must complete a minimum of three units, or one course, in Mathematics, and a minimum of three units, or one course, in Natural Science or Computer Science. The remaining units may be taken from any category.**

## Mathematics

Code	Title	Units
ANTH-215	Statistics for the Behavioral Sciences	
BIO-215	Statistics for Life Sciences	
MATH-150	Introduction to Computer Programming Applications in Mathematics	
MATH-160	Elementary Statistics	
MATH-170	Analytic Trigonometry <sup>1</sup>	
MATH-175	College Algebra	
MATH-176	Precalculus: Functions and Graphs	
MATH-178	Calculus for Business, Social and Behavioral Sciences	
MATH-180	Analytic Geometry and Calculus I	
MATH-245	Discrete Mathematics	
MATH-280	Analytic Geometry and Calculus II	
MATH-281	Multivariable Calculus	
MATH-284	Linear Algebra	
MATH-285	Differential Equations	
PSC-120	Fundamentals of Scientific Computing (MATLAB)	

PSY-215	Statistics for the Behavioral Sciences
SOC-215	Statistics for the Behavioral Sciences

<sup>1</sup> Non-UC transferable course.

## Natural Science

Code	Title	Units
ANTH-130	Introduction to Biological Anthropology	
ANTH-131	Biological Anthropology Laboratory	
ASTR-110	Descriptive Astronomy	
ASTR-112	General Astronomy Laboratory	
ASTR-120	Exploration of the Solar System	
BIO-105	Marine Biology	
BIO-110	Environmental Biology	
BIO-112	Contemporary Issues in Environmental Resources	
BIO-114	Heredity, Evolution and Society	
BIO-118	Introduction to Human Biology	
BIO-120	Principles of Biology	
BIO-140	Human Anatomy	
BIO-141	Human Physiology	
BIO-141L	Laboratory in Human Physiology	
BIO-144	Anatomy and Physiology I	
BIO-145	Anatomy and Physiology II	
BIO-152	Paramedical Microbiology	
BIO-230	Principles of Cellular, Molecular and Evolutionary Biology	
BIO-240	Principles of Ecology, Evolution and Organismal Biology	
CHEM-102	Introduction to General, Organic and Biological Chemistry	
CHEM-110	Environmental Chemistry	
CHEM-113	Forensic Chemistry	
CHEM-115	Fundamentals of Chemistry	
CHEM-116	Introductory Organic and Biochemistry	
CHEM-117	Introductory Biochemistry	
CHEM-120	Preparation for General Chemistry	
CHEM-141	General Chemistry I	
CHEM-142	General Chemistry II	
CHEM-231	Organic Chemistry I	
CHEM-232	Organic Chemistry II	
CHEM-241	Organic Chemistry I Lecture	
CHEM-241L	Organic Chemistry I Laboratory	
CHEM-242	Organic Chemistry II Lecture	
CHEM-242L	Organic Chemistry II Laboratory	
GEOG-104	Introduction to Geographic Information Science	
GEOG-106	World Regional Geography	
GEOG-120	Physical Geography: Earth Systems	
GEOG-121	Physical Geography: Earth Systems Laboratory	
GEOG-130	Human Geography: The Cultural Landscape	
GEOG-140	Meteorology: Weather and Climate	

GEOG-150	Field Study of the Natural History of the Greater San Diego Region
GEOG-170	The Geography of California
GEOL-104	Earth Science
GEOL-110	Planet Earth
GEOL-111	Planet Earth Laboratory
GEOL-121	Earth History
GEOL-150	Field Study of the Natural History of the Greater San Diego Region
GEOL-210	Geology of California
GEOL-230	Natural Disasters
OCEA-112	Introduction to Oceanography
OCEA-113	Oceanography Laboratory
OCEA-150	Field Study of the Natural History of the Greater San Diego Region
PHYC-110	Introductory Physics
PHYC-130	Fundamentals of Physics
PHYC-131	Fundamentals of Physics
PHYC-140	Mechanics of Solids
PHYC-201	Mechanics and Waves
PHYC-202	Electricity, Magnetism, and Heat
PHYC-203	Light, Optics, and Modern Physics
PHYC-240	Electricity, Magnetism, and Heat
PHYC-241	Light, Optics, and Modern Physics
PSC-100	Physical Science for Elementary Education
PSC-110	Introduction to the Physical Sciences
PSC-111	Introduction to Physical Sciences Laboratory
SCI-110	Introduction to Scientific Thought

## Computer Science

Code	Title	Units
CSIS-165	Assembly Language and Machine Architecture	
CSIS-240	Discrete Structures <sup>1</sup>	
CSIS-250	Introduction to Python Programming <sup>1</sup>	
CSIS-251	Intermediate Python Programming and Fundamental Data Structures <sup>1</sup>	
CSIS-255	Introduction to Programmable Logic Controllers <sup>1</sup>	
CSIS-293	Introduction to Java Programming	
CSIS-294	Intermediate Java Programming and Fundamental Data Structures	
CSIS-296	Introduction to C++ Programming	
CSIS-297	Intermediate C++ Programming	

<sup>1</sup> Non-UC transferable course.