

# Liberal Arts with an Area of Emphasis in Mathematics and Sciences

## Academic and Career Pathway

Math and Sciences

### Associate in Arts Degree

#### Liberal Arts with an Area of Emphasis in Mathematics and Sciences

The science courses in this category examine the physical universe, its life forms, and its natural phenomena. These courses assist the student in developing an appreciation of the scientific method and encourage an understanding of the relationships between science and other human activities. The mathematics courses encourage the understanding of mathematical concepts through the development of quantitative reasoning skills.

This area of emphasis provides students with lower-division preparation for a variety of majors within the scientific disciplines, including astronomy, biology, chemistry, and physics, as well as preparation for mathematics majors. Additionally, students may prepare for nursing, kinesiology, public health, and other health science majors. Many of the courses will assist students in prerequisite preparation for graduate programs within the health sciences. A point system using multi-criteria approved by the California Community Colleges Chancellor's Office is used to accept students into the RN program.

#### Graduation Requirements

- ▶ Complete a minimum of 60 degree-applicable units of credit (including major and general education courses).
- ▶ Complete all courses required in the major with a "C" or "P" or better.
- ▶ Complete a general education pattern of courses (see Associate Degrees).
- ▶ Obtain a minimum GPA of 2.0.
- ▶ Complete a minimum of 12 units in residence at MiraCosta College.

#### Program Student Learning Outcome

Upon completion of this program, the student will be able to develop communication, critical thinking, and intellectual skills that effectively prepare him/her for lifelong learning and for advanced study in a wide range of majors at the university level.

#### Course Requirements

Select a minimum of 18 units from the following courses. At least one course must be a mathematics course. Courses outside of the mathematics discipline that are approved for the quantitative reasoning requirement on Plans B and C may be used in lieu of a course with the MATH prefix.

ANTH 101	Biological Anthropology	3
or ANTH 101H	Biological Anthropology (Honors)	
ANTH 101L	Biological Anthropology Laboratory	1
or ANTH 101LH	Biological Anthropology Lab (Honors)	
ANTH 105	Evolution of Human Behavior	3
or ANTH 105H	Evolution of Human Behavior (Honors)	
ANTH 190	Primate Behavior and Ecology	3
ASTR 101	Descriptive Astronomy	3
ASTR 101L	Descriptive Astronomy Laboratory	1
ASTR 120	Life in the Universe	3
BIO 102	Introductory Biology: Ecology and Environmental Biology	4
BIO 103	Introductory Biology: Animal Diversity	3
BIO 104	Introductory Biology: Botany (Plant Life)	4
BIO 105	Introductory Biology: Biotechnology in Society	3
BIO 107	Introductory Biology: Marine Biology	4
BIO 108	Introductory Biology: Ocean Ecology and Sustainability	3
BIO 108L	Introductory Biology: Ocean Ecology and Sustainability Lab	1
BIO 110	Introductory Biology: Preparation for Pre-Health Professions (Lecture/Lab)	4
or BIO 111 & 111L	Introductory Biology: Preparation for Pre-Health Professions (Lecture) and Introductory Biology: Preparation for Pre-Health Professions (Lab)	
BIO 202	Foundations of Biology: Evolution, Biodiversity, and Organismal Biology	4
BIO 204	Foundations of Biology: Biochemistry, Cell Biology, Genetics, and Molecular Biology	4
or BIO 204H	Foundations of Biology: Biochemistry, Cell Biology, Genetics, and Molecular Biology (Honors)	
BIO 210	Human Anatomy	4
or BIO 210H	Human Anatomy (Honors)	
BIO 220	Human Physiology	4
BIO 230	Introduction to Microbiology	5
BTEC 108	Biomanufacturing: From Gene to Product	3
or BTEC 108H	Biomanufacturing: From Gene to Product (Honors)	
BTEC 180	Biostatistics	4
or BTEC 180H	Biostatistics (Honors)	
BUS 147	Personal Finance	3
BUS 204	Business Statistics	3
or BUS 204H	Business Statistics (Honors)	
CHEM 103	Chemistry and Society: For Non-Science Majors	3
CHEM 103L	Chemistry and Society: For Non-Science Majors (Lab)	1
CHEM 112	Introductory General, Organic, and Biological Chemistry: For Allied Health Majors	5

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CHEM 115	Introductory General Chemistry: For Allied Health Majors	4	MATH 135	Pre-Calculus Mathematics	6
or CHEM 115H	Introductory General Chemistry: For Allied Health Majors (Honors)		MATH 150	Calculus and Analytic Geometry I	5-7
CHEM 116	Introductory Organic and Biological Chemistry: For Allied Health Majors	4	or MATH 150H	Calculus and Analytic Geometry I (Honors)	
CHEM 140	Preparation for General Chemistry: For Science Majors	4	or MATH 150S	Calculus and Analytical Geometry I with Integrated Support	
CHEM 150	General Chemistry I: For Science Majors	5	MATH 155	Calculus and Analytic Geometry II	4
or CHEM 150H	General Chemistry I: For Science Majors (Honors)		or MATH 155H	Calculus and Analytic Geometry II (Honors)	
CHEM 151	General Chemistry II: For Science Majors	5	MATH 226	Discrete Mathematics	4
or CHEM 151H	General Chemistry II: For Science Majors (Honors)		or MATH 226H	Discrete Mathematics (Honors)	
CHEM 210	Organic Chemistry I: For Science Majors	5	MATH 260	Calculus and Analytic Geometry III	4
or CHEM 210H	Organic Chemistry I: For Science Majors (Honors)		or MATH 260H	Calculus and Analytic Geometry III (Honors)	
CHEM 211	Organic Chemistry II: For Science Majors	5	MATH 265	Differential Equations	4
or CHEM 211H	Organic Chemistry II: For Science Majors (Honors)		or MATH 265H	Differential Equations (Honors)	
CSIT 123	Introduction to Data Analytics	3	MATH 270	Linear Algebra	4
EART 106	Earth and Space Science	3	or MATH 270H	Linear Algebra (Honors)	
or EART 106H	Earth and Space Science (Honors)		NUTR 100	Nutrition Today	3
GEOG 101	Earth's Dynamic Environment: Introduction to Physical Geography	3	or NUTR 100H	Nutrition Today (Honors)	
GEOG 101L	Earth's Dynamic Environment: Introduction to Physical Geography Lab	1	NUTR 120	Principles of Food Science with Lab	3
GEOL 101	Physical Geology	3	OCEA 101	Introduction to Oceanography	3
or GEOL 101H	Physical Geology (Honors)		or OCEA 101H	Introduction to Oceanography (Honors)	
GEOL 101L	Physical Geology Laboratory	1	OCEA 101L	Introductory Oceanography Laboratory	1
HORT 115	Soil Science	3	PHSN 106	Introduction to Physical Science: Physics and Chemistry	3
HORT 116	Plant Science	4	PHSN 108	Introduction to Climate Change	3
MATH 102	Math Fundamentals: Mathematics for Life	3	or PHSN 108H	Introduction to Climate Change (Honors)	
MATH 103	Statistics	4-5	PHYS 111	Introductory Physics I	4
or MATH 103H	Statistics (Honors)		or PHYS 111H	Introductory Physics I (Honors)	
or MATH 103S	Statistics with Integrated Support		PHYS 112	Introductory Physics II	4
MATH 105	Concepts and Structures of Elementary Mathematics I	3	or PHYS 112H	Introductory Physics II (Honors)	
MATH 106	Concepts and Structures of Elementary Mathematics II	3	PHYS 151	Principles of Physics I	4
MATH 112	Algebraic Concepts for Problem Solving	3	or PHYS 151H	Principles of Physics I (Honors)	
MATH 115	Calculus with Applications	5	PHYS 152	Principles of Physics II	4
MATH 126	Pre-Calculus I: College Algebra	4	or PHYS 152H	Principles of Physics II (Honors)	
or MATH 126S	Pre-Calculus I: College Algebra with Integrated Support		PHYS 253	Principles of Physics III	4
MATH 131	Pre-Calculus II: Trigonometry and Analytic Geometry	4	or PHYS 253H	Principles of Physics III (Honors)	
or MATH 131H	Pre-Calculus II: Trigonometry and Analytic Geometry (Honors)		PHYS 280	Introduction to Electronics	3
			PSYC 104	Statistics for Behavioral Science	4
			or PSYC 104H	Statistics for Behavioral Science (Honors)	
			PSYC 260	Physiological Psychology	3
			SOC 125	Introduction to Statistics in Sociology	4