



## **CURRICULUM GUIDE 2015-2016**

### **NATURAL SCIENCE**

#### **Associate in Arts in Natural Science**

The Associate in Arts in Natural Science has three areas of emphasis: Biological Science; Physical Science; and Mathematics and Technology. Students may choose one of these emphases to earn a degree in Natural Science. These emphases will provide students with the knowledge and skills to succeed in a variety of science or technological careers. Graduates with an Associate in Arts in Natural Science will develop a strong foundation in the life sciences, physical sciences, and mathematics. Furthermore, the theoretical knowledge and laboratory skills acquired by students in these programs will also enhance their success with obtaining entry-level jobs that require two years of college-level science and math.

It is imperative that students entering Ohlone's Associate in Arts in Natural Science meet with a counselor at the start of their academic work. Counselors will assist students in preparing a comprehensive Student Education Plan that will prepare them to pursue their academic goals.

#### **Requirements for Associate in Arts Degree:**

- a) Complete the Major Field courses with a grade of C or better.
- b) Complete a minimum of twenty transferable units selected from one of the areas of emphasis, including a minimum of twelve units in the same department and an additional eight units from any of the courses within the emphasis.
- c) Complete Ohlone College General Education (Plan A), CSU GE (Plan B), or IGETC (Plan C) requirements. These requirements are specified in the Ohlone College catalog. Students who do not intend to transfer may complete Ohlone College General Education; students who intend to transfer may complete either CSU GE or IGETC. Counselors will advise students on the general education plan that best prepares them for pursuing an associate degree and/or transfer.
- d) Complete at least 60 degree-applicable units with a 2.0 grade point average.
- e) Complete at least 12 units at Ohlone College.
- f) Complete at least 50% of the Major Field courses at Ohlone College.

#### **Student Learning Outcomes**

1. Gain knowledge and skills to succeed in a variety of science or technological careers.
2. Gain knowledge and skills to succeed in science majors at a baccalaureate university.

## MAJOR FIELD

### Biological Science Emphasis

This emphasis will enable students to develop a strong foundation in the life sciences. Furthermore, the theoretical knowledge and laboratory skills acquired by students in this emphasis will also enhance their success with obtaining entry-level jobs that require two years of college-level life science and laboratory skills.

Complete a minimum of twelve units from the Biology courses listed below and an additional eight units from any of the remaining courses within this emphasis.

ANTH-101	Physical Anthropology	4
BIOL-101A	Principles of Biology -- Molecular and Cellular	5
BIOL-101B	Principles of Biology -- Organisms and Systems	5
BIOL-103A	Human Anatomy and Physiology	4
BIOL-103B	Human Anatomy and Physiology	4
BIOL-104	Basic Human Anatomy and Physiology	4
BIOL-105	Heredity, Evolution, and Society	3
BIOL-106	Microbiology	5
BIOL-107	Microbiology and Infectious Diseases	3
BIOL-109	Biology of Sexual Reproduction	3
BIOL-114	Introduction to Plant Biology	3
BIOL-130	Introduction to Biology	4
BIOL-140	Sierra Nevada Natural History	3
BIOL-141	Marine Biology	3
BIOL-142	Environmental Biology	4
BIOT-100	Biotechnology and Society	3
BIOT-105	Introduction to Cell and Molecular Biology	4
ENVS-108	Introduction to the Environment	3

Total Required Units: 20

### Physical Science Emphasis

This emphasis will enable students to develop a strong foundation in the physical sciences. Furthermore, the theoretical knowledge and laboratory skills acquired by students in this emphasis will also enhance their success with obtaining entry-level jobs that require two years of college-level physical science and laboratory skills.

Complete a minimum of twelve units from either the Chemistry, Geology, or Physics courses listed below and an additional eight units from any of the remaining courses within this emphasis.

ASTR-101A	General Astronomy of the Solar System	3
ASTR-101B	General Astronomy Beyond the Solar System	3
ASTR-102	General Astronomy Lab	1
CHEM-101A	General Chemistry	5
CHEM-101B	General Chemistry	5
CHEM-102	Preparation for General Chemistry	4
CHEM-108	Survey of Chemistry	3
CHEM-109	Biochemistry for Health Science and Biotechnology	4
CHEM-112A	Organic Chemistry	5
CHEM-112B	Organic Chemistry	5
GEOG-101	Physical Geography	4
GEOL-101	Introduction to Geology	4
GEOL-102	Introduction to Oceanography	3
GEOL-102L	Oceanography Laboratory	1
GEOL-103	Paleontology and Dinosaurs	3
GEOL-103L	Earth History and Paleontology Laboratory	1
PHYS-108	Survey of Physics	3
PHYS-120	Introduction to Physics I	4

PHYS-120A	Introduction to Physics – Calculus Supplement	1
PHYS-121	Introduction to Physics II	4
PHYS-121A	Introduction to Physics II – Calculus Supplement	1
PHYS-140	Mechanics	4
PHYS-141	Electricity and Magnetism	4
PHYS-142	Optics, Heat, and Modern Physics	4

Total Required Units: 20

### Mathematics and Technology Emphasis

This emphasis will enable students to develop a strong foundation in mathematics and technology. Furthermore, the theoretical knowledge and laboratory skills acquired by students in this emphasis will also enhance their success with obtaining entry-level jobs that require two years of college-level mathematics and technology courses. Courses prepare students for technical careers such as in information technology, systems administration, and networking.

Complete a minimum of twelve units in the same department, a minimum of three units in Mathematics, and a minimum of three units in technology (CS or CNET).

CNET-105	IT Essentials (CompTIA A+)	4
CNET-114	How Technology Works	4
CNET-170	Network Security (Security+)	4
CS-101	Introduction to Computers and Information Technology	3
CS-102	Introduction to Computer Programming Using C++	3
CS-104A	Introduction to .NET Programming	4
CS-104B	Advanced .NET Programming	4
CS-116	Object-Oriented Programming Using C++	4
CS-118	Introduction to Assembly Language Programming	3
CS-124	Programming with Data Structures	3
CS-125	Introduction to Programming Using Java	4
CS-131	Computing Concepts in Biotechnology	4
CS-133	Introduction to SAS Programming	3
CS-137	Introduction to SQL	4
CS-141B	SAS Graphing and ODS	2
CS-143	Advanced SAS Programming	3
CS-146	Introduction to UNIX/Linux	3
CS-147	UNIX/Linux Shell Scripting	4
CS-149	PERL Programming	4
CS-152	Data Communications	2
CS-157	TCP/IP and Internetworking	3
CS-162	XHTML	4
CS-170	Java Programming	4
CS-175	From JavaScript to AJAX	4
CS-178	XML	3
ENGI-135	Introduction to Robotics and Automated Systems	4
MATH-101A	Calculus with Analytic Geometry	5
MATH-101B	Calculus with Analytic Geometry	5
MATH-101C	Calculus with Analytic Geometry	5
MATH-103	Introduction to Linear Algebra	3
MATH-104	Differential Equations	5
MATH-111	Introduction to Matlab for Engineers	3
MATH-159	Introduction to Statistics	5
MATH-163	Discrete Mathematics for Computers	3
MATH-166	Finite Mathematics	4
MATH-167	Calculus for Business and Social Science	5
MATH-181	Trigonometry	3
MATH-188	Pre-Calculus	5

Total Required Units: 20