

BIOLOGY – AS (calculus, with organic chem)

("Chem Major" Or "Pre-Med/Pre-Veterinary/Pre-Pharmacy Majors")

This is the Associate in Science, Biology, with calculus and organic chemistry, program map for the Math & Sciences Area of Study. This map is intended as a general guide. Please work with your academic advisor regarding your specific goals and transfer requirements. Note: Students who do not place into ENGL& 101 or MATH& 151 will need to take other English or Math classes, which will increase the time required to earn this AS degree.

Order	Category	Course	Credits
FALL YR 1			
1	Quantitative Skills 1	MATH& 151: Calculus I	5
2	Required Pre-Major	CHEM& 161: General Chemistry with Lab I	5
3	Communication Skills	ENGL& 101: Composition	5
WINTER YR 1			
4	Quantitative Skills 2	MATH& 152: Calculus II	5
5	Required Pre-Major	CHEM& 162: General Chemistry with Lab II	5
6	Humanities 1	Choose one: CMST& 220: Public Speaking PHIL& 115: Critical Thinking IS 107: History of Reason IS 109: Intro to Indigenous Humanities Any ART course	5
SPRING YR I			
7	Quantitative Skills 3	MATH& 163: Calculus III	5
8	Required Pre-Major	CHEM& 163: General Chemistry with Lab III	5
9	Social Science 1	Choose one: ECON& 201: Microeconomics ECON& 202: Macroeconomics HIST& 126, 127, or 128: World History I, II, or III SOCSI 101: Contemporary Global Issues *PSYC 100: General Psychology	5
FALL YR 2			
10	Required Pre-Major	CHEM& 241: Organic Chemistry I	5
11	Required Pre-Major	BIOL& 221: Ecology and Evolution	5

9	Humanities 2 <i>must be a different subject than humanities 1</i>	PHIL& 115: Critical Thinking IS 107: History of Reason or IS 109: Intro to Indigenous Humanities Any ART course	5
	Or	Or	
	Social Science 2 <i>must be a different subject than social science 1</i>	ECON& 201: Microeconomics ECON& 202: Macroeconomics HIST& 126, 127 or 128: World History I, II, or III SOCSI 101: Contemporary Global Issues *PSYC 100: General Psychology	
Or	Or		
Additional Optional	CMST& 220: Public Speaking PHYS 114: General Physics with Lab I BIOL 290-294: Undergraduate Research in Biology BIOL 283: Native Plant Propagation BIOL& 241L Human Anatomy and Physiology I <i>(recommended for Pre-Med, Pre-Veterinary, and Pre-Pharmacy majors)</i>		
WINTER YR 2			
10	Additional Requirement	Choose one: CHEM& 242: Organic Chemistry II and CHEM& 252: Organic Chem Lab II	7
11	Required Pre-Major	BIOL& 222: Molecular and Cellular Biology	5
12	Humanities 2 <i>must be a different subject than humanities 1 & 2</i>	Choose one: CMST& 220: Public Speaking PHIL& 115: Critical Thinking IS 107: History of Reason or IS 109: Intro to Indigenous Humanities Any ART course	5
	Or	Or	
	Social Science 2 <i>must be a different subject than social science 1 & 2</i>	ECON& 201: Microeconomics ECON& 202: Macroeconomics HIST& 126, 127 or 128: World History I, II, or III SOCSI 101: Contemporary Global Issues *PSYC 100: General Psychology	
Or	Or		
Additional Requirement	Any Natural Science BIOL& 242: Human Anatomy and Physiology II <i>(recommended for Pre-Med, Pre-Veterinary, and Pre-Pharmacy majors)</i>		

SPRING YR 2			
16	Additional Requirement	Choose one: CHEM& 243: Organic Chemistry III and CHEM& 253: Organic Chem Lab III	7
17	Required Pre-Major	BIOL& 223: Organismal Biology	5
18	Elective/Additional Requirement	Choose one: BIOL 290-294: Undergraduate Research in Biology BIOL 285: Plant Propagation and 286 Elwha Restoration Research BOT 101: Intro to Botany *PSYC& 200: Lifespan Psychology Any college level course	5
			Total credits required: 90

**Pre-Med students should take PSYC& 100 and PSYC& 200 as part of their program.*

Math & Science

Area of Study Learning Outcomes

Communication Competencies

- Comprehend the difference between written opinions vs ideas supported by scientific inquiry.
- Demonstrate the ability to communicate scientific ideas and the process of science.

Quantitative Reasoning

- Manipulate numbers (large and small), use common measurement systems, and solve simple linear algebraic problems.
- Recognize functional relationships between and among measurable phenomena.
- Apply systematic approaches and logic to solving quantitative problems.
- Translate mathematical symbols into words and words into mathematical symbols.
- Demonstrate the ability to use modeling and simulation to solve scientific problems.

Information Competencies

- Recognize the difference between questions of high scientific impact vs those unlikely to provide critical information about a scientific phenomenon or process.
- Ability to apply the process of science.

Critical Thinking

- Identify and troubleshoot scientific problems
- Demonstrate the ability to use quantitative reasoning and analyze data.
- Demonstrate the ability to apply the process of science.

Personal and Interpersonal Competencies

- Gain an understanding of the relationships between science and society.
- Gain familiarity with and an appreciation for the interdisciplinary nature of science.

- Demonstrate the ability to collaborate and understand the importance of collaboration in science.

Career Pathways

By earning a degree or certificate in the area of Math & Science you'll be on your way to any of the following career opportunities listed below:

- astronomer
- atmospheric scientist
- bioengineer
- biologist
- chemist
- computer scientist
- engineer
- environmental scientist
- mathematician
- materials scientist
- physicist
- sustainable agriculturist

Program Notes

Please note that many universities require a foreign language as an admissions criterion.

A Passion for a Unique Educational Opportunity

Our Honors program is for highly motivated students who seek to be engaged in an intensive learning process where they make connections among ideas while developing critical thinking skills as they pursue an Associate of Arts or Associate of Science degree. Students discover their intellectual interests, and the gateway to a culminating capstone experience. This distinct Honors Program leads to sustained academic success after transfer, and lifelong success after college. Contact Barbara Blackie, Honors Program Coordinator, at bblackie@pencol.edu for more information.

Math Information

If you are not ready for college level Math, please contact your advisor about adjusting your course sequence as needed. See below for Math sequence for this pathway:



Please note, if you change your pathway from an Associates of Arts to an Associates of Science or to a Professional Technical pathway, the Math pathway will change also.

English Composition Information

If you are not ready for college level English courses, please contact your advisor about adjusting your course sequence as needed. See below for English pathway options:



Chemistry Information

CHEM& 121 or a 2.0 in high school Chemistry is a prerequisite for CHEM& 161. If needed, CHEM& 121 could be counted as an additional requirement.