

# PRE-PHYSICAL SCIENCE – AS (students placing into pre-calculus)

This is the Associate in Science, Pre-Physical Science (students placing into pre-calculus) 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 MATH& 141, ENGL& 101 or CHEM& 161L will need to take additional Math, English and/or Chemistry classes, which will increase the time required to earn this AS degree.

Order	Category	Course	Credits
<b>FALL YR 1</b>			
1	Remaining Credits 1	COLL 101: College Success	5
2	Required Pre-Major 1	CHEM& 161: General Chem with Lab I	5
3	Remaining Credits 2	MATH& 141: Pre-calculus	5
<b>WINTER YR 1</b>			
4	Remaining Credits 3	MATH& 142: Pre-Calculus II (5)	5
5	Required Pre-Major 2	CHEM 162: General Chemistry with Lab II (5)	5
6	Communication Skills 1	ENGL& 101: Composition I	5
<b>SPRING YR I</b>			
7	Required Pre-Major 3	MATH& 146: Statistics <i>Note: unless MATH&amp; 163 Calculus III will be taken later, in which case, take an Additional Requirement. Any qualifying science or math (see advisor)</i>	5
8	Required Pre-Major 4	CHEM& 163: General Chemistry with Lab III	5
9	Humanities 1	<i>Choose one:</i> CMST& 210: Interpersonal Communication CMST& 220: Public Speaking Other Humanities	5
<b>FALL YR 2</b>			
10	Quantitative Skills 1	MATH& 151: Calculus I	5
11	Required Pre-Major 5	PHYS& 221: Engineering Physics I	5
12	Add'l Requirement 2	<i>Choose one:</i> BIOL& 221: Ecology and Evolution CS& 141: Computer Science I with Java Other qualifying science	5

WINTER YR 2			
13	Quantitative Skills 2	MATH& 152: Calculus II	5
14	Required Pre-Major 6	PHYS& 222: Engineering Physics II	5
15	Social Science 1	<i>Choose one:</i> ECON& 201: Microeconomics ECON& 202: Macroeconomics HIST& 126: World History I HIST& 127: World History II HIST& 128: World History III SOCSI 101: Contemporary Global Issues	5
SPRING YR 2			
16	Required Pre-Major 3	MATH& 163: Calculus III <i>Note: unless MATH&amp; 146 Statistics already taken, in which case, take an Additional Requirement. Any qualifying science (Add'l Requirement 1)</i>	5
17	Required Pre-Major 7	PHYS& 223: Engineering Physics III	5
18	Social Science/Humanities 2	<i>Choose one:</i> HIST& 126, 127, or 128: World History I, II, or III Other Social Science PHIL& 101: Introduction to Philosophy PHIL& 115: Critical Thinking Other Humanities	5
			Total credits required: 90

## Math & Science

### Area of Study 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](mailto: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.