

# Science, AS, and Options

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## ABOUT THE PROGRAM

The AS in Science provides the math and science foundation necessary to pursue later specialization, graduate study, and professional schools. All students in the AS in Science must choose one of four options: Biology, Chemistry, Earth Systems and Environmental Science, or Physics. Each option prepares students for transfer to a complementary four-year degree program. Students in the Biology, Chemistry, or Earth Systems and Environmental Science options transfer to four-year science programs (biochemistry, biology, chemistry, earth and environmental science, etc.), teacher education programs, pharmacy schools, or engineering programs (biomedical, chemical, environmental). Students in the Physics option usually transfer to colleges offering bachelor's degrees in engineering (civil, electrical, mechanical, etc.) or in the physical sciences. Enrichment programs are offered to encourage students to continue their education beyond the bachelor degree by attending graduate or other professional programs (e.g., medical school, physical assistant programs, physical therapy programs).

**NOTE:** This degree program was previously called the AS in Liberal Arts and Sciences.

## Learning Outcomes

Upon successful completion of the Science program requirements, students will be able to:

1. Identify and apply the fundamental concepts and methods of a life or physical science.
2. Apply the scientific method to explore natural phenomena, including hypothesis development, observation, experimentation, measurement, data analysis, and data presentation.
3. Interpret and draw appropriate inferences from quantitative representation such as formulas, graphs, or tables and represent quantitative problems expressed in natural language in a mathematical format.
4. Use algebraic, numerical, graphical, or statistical methods to solve mathematical problems and to apply mathematical methods in a scientific field.

# SCIENCE

Associate in Science Degree | Transfer Degree

Department of Chemistry, Earth Sciences, and Environmental Sciences

## Program Description

### Science: Earth Systems and Environmental Science Option

A student interested in the AS in Science has to choose one of four options: Biology, Chemistry, Earth Systems and Environmental Science, or Physics. Each option prepares students for transfer to a complementary four-year degree program. Students in the Chemistry and the Earth Systems and Environmental Science options transfer to four-year science programs (biochemistry, biology, chemistry, earth and environmental science, etc.), teacher education programs, pharmacy schools, or engineering programs (biomedical, chemical, environmental). Enrichment programs are offered to encourage students to continue their education beyond the bachelor degree by attending graduate or other professional programs (e.g., medical school, physician assistant programs, physical therapy programs).

## Learning Outcomes

Upon successful completion of the Science program requirements, students will be able to:

1. Identify and apply the fundamental concepts and methods of a life or physical science.
2. Apply the scientific method to explore natural phenomena, including hypothesis development, observation, experimentation, measurement, data analysis, and data presentation.
3. Interpret and draw appropriate inferences from quantitative representation such as formulas, graphs, or tables and represent quantitative problems expressed in natural language in a mathematical format.
4. Use algebraic, numerical, graphical, or statistical methods to solve mathematical problems and to apply mathematical methods in a scientific field.

Upon successful completion of the Earth Systems and Environmental Science option requirements, students will be able to:

1. Demonstrate knowledge of research and theory of plate tectonics.
2. Apply research skills to successfully classify rock samples or unknown chemicals.
3. Write an essay to clearly explain discipline-specific ideas.

## SCIENCE CURRICULUM (PATHWAYS)

60 Credits required for AS Degree

Curriculum Coordinator: Dr. Sheldon Skaggs

### Required Core

- A. English Composition (6 Credits)
- B. Mathematical and Quantitative Reasoning
  - MTH 28<sup>1,2</sup> College Algebra and Elementary Trigonometry (3 Credits)
- C. Life and Physical Science
  - CHM 11<sup>1</sup> General College Chemistry I (4 Credits)

#### SUBTOTAL 14

### Flexible Core

- A. World Cultures and Global Issues (3 Credits)
- B. U.S. Experience in its Diversity (3 Credits)
- C. Creative Expression (3 Credits)
- D. Individual and Society (3 Credits)
- E. Scientific World
  - CHM 12<sup>1</sup> General College Chemistry II (4 Credits)
  - MTH 30<sup>1,2</sup> Pre-Calculus Mathematics (4 Credits)

Restricted Elective Select one course from Area A-E.<sup>2</sup> (3 Credits)

#### SUBTOTAL 19

### Major Requirements

- MTH 31 Analytic Geometry and Calculus I (0-4 Credits)
- MTH 32 Analytic Geometry and Calculus II (5 Credits)
- FYS 11<sup>3</sup> First Year Seminar (1 credit)
- Free Electives<sup>2</sup> (0-7 Credits)

### Earth Systems and Environmental Science Option Requirements

- CHM 27 Principles of Laboratory Safety (2 Credits)
- CHM 33 Quantitative Analysis (4 Credits)
- Choose two of the three courses below:
  - ESE 11 Earth Systems Science: The Earth *OR*
  - ESE 12 Earth Systems Science: The Atmosphere *OR*
  - ESE 13 Earth Systems Science: The Ocean (8 Credits)
- ESE 21 Earth Systems Science: The Environment (4 Credits)

#### TOTAL 27

<sup>1</sup> This program has obtained a waiver to require STEM variant courses in Required Core Area B and Area C and Flexible Core Area E. If students transferring into this program complete different courses in these areas, they will be certified as having completed the Common Core requirements, but it may not be possible for them to finish their degree within the regular number (60) of credits.

<sup>2</sup> Students who place out of MTH 28 and/or MTH 30 will take elective course(s) to complete 60 total degree credits. (Students in the Earth Systems and Environmental Science Option are recommended to take either GIS 11 or GIS 12 to fulfill free elective credits.) In such cases, major/option courses can be used to satisfy appropriate core requirements.

<sup>3</sup> Students transferring into the program with 24 or more degree or equated credits will be exempt from FYS 11, and can take 1 credit of elective to satisfy this requirement.

<sup>4</sup> It is recommended that students take either GIS 11 or GIS 12 to fulfill free elective credits.

**Students are encouraged to check the Transfer Planning website for information on articulation agreements.**

