

# 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).

## 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 Engineering, Physics and Technology

## Program Description

### Science: Physics 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 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, physician assistant programs, physical therapy programs). Please note that the option articulates with SUNY Empire State College. Please visit the Transfer Planning web site for more details.

## 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 Physics option requirements, students will be able to:

1. Students will demonstrate a conceptual understanding of Physics principles, including those in Newtonian Mechanics, Electricity, Fluid Dynamics, and Magnetism.
2. Students will show mastery of a variety of experimental techniques, data analysis, scientific writing, and presentation skills.
3. Students will demonstrate the ability to use analytical and / or computational methods to solve Physics problems.

## SCIENCE CURRICULUM (PATHWAYS)

60 Credits required for AS Degree

Option Coordinator: Dr. Joseph Malinsky

### Required Core

- A. English Composition (6 Credits)
  - B. Mathematical and Quantitative Reasoning
    - MTH 28<sup>1,2</sup> College Algebra and Elementary Trigonometry *OR* MTH 28.5 College Algebra and Elementary Trigonometry (Corequisite) (3 Credits)
  - C. Life and Physical Science
    - CHM 11<sup>1</sup> General Chemistry I (4 Credits)
- SUBTOTAL 13**

### 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
  - F. CHM 12<sup>1</sup> General Chemistry II (4 Credits)
    - MTH 30<sup>1,2</sup> Pre-Calculus Mathematics (4 Credits)
- SUBTOTAL 19**

### Major Requirements

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

### Physics Option Requirements

- MTH 33 Analytic Geometry and Calculus III (4 Credits)
- PHY 31 Physics I (4 Credits)
- PHY 32 Physics II (4 Credits)
- PHY 33 Physics III (4 Credits)
- Free Electives (2 Credits)

**SUBTOTAL 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. 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.

