Science, AS, and Options

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).

PLEASE 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: Chemistry 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 Chemistry option requirements, students will be able to:

1. Demonstrate their knowledge in general, organic and analytical chemistry by identifying, analyzing, and solving the problems.
2. Interpret experimental outcomes, carry out organic syntheses, interpret instrumental analysis data and possess working knowledge of lab safety.
3. Write lab reports using the experimental data, perform computations, analyze graphs and utilize software programs such as "Chem Draw".
4. Apply chemistry principles by participating with faculty on research projects, by gaining industrial experience through department administered internships, or by giving oral presentations at STEM conferences.
5. Gain experience in operating the following instrumentation: FT-IR, NMR, GC/MS, and HPLC, Ion Chromatograph, Spectrofluorimeter, UV/Vis Spectrophotometer, 3D printers.

SCIENCE CURRICULUM (PATHWAYS)

60 Credits required for AS Degree

Curriculum Coordinator: Dr. Soosairaj Therese and Dr. Sunej Hans

Required Core

A. English Composition (6 Credits)

B. Mathematical and Quantitative Reasoning

- MTH 30[1] Pre-Calculus Mathematics *OR*
  MTH 31 Analytic Geometry and Calculus I (4 Credits)

C. Life and Physical Science

- CHM 11[1] 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[1] General College Chemistry II (4 Credits)

Restricted Elective Select one course from Area A-E.[2] (3 Credits)

SUBTOTAL 19

Major Requirements

- Free Electives (0 - 4 Credits)
- MTH 31[3] Analytic Geometry and Calculus I (0 - 4 Credits)
- MTH 32 Analytical Geometry and Calculus II (5 Credits)

Chemistry Option Requirements

- CHM 31 Organic Chemistry I (5 Credits)
- CHM 32 Organic Chemistry II (5 Credits)
- Choose two of the five courses below:
  BIO 11 General Biology I AND/*OR*
  BIO 34 /CHM 34 Biofuels and Bioproducts AND/*OR* CHM 21 Introduction to Chemical Processes AND/*OR* CHM 33 Quantitative Analysis AND/*OR* PHY 11 Physics I (8 Credits)

TOTAL 27

[1] 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.

[2] Restricted Elective: must select one course from Flexible Core A-E. No more than two courses in any discipline or interdisciplinary field.

[3] Students in this major are required to take MTH 30 or MTH 31 to fulfill required Core Area B. Note that MTH 30 is a prerequisite to MTH 31, so students who take MTH 30 to fulfill Required Core B will not have free elective credits.

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