CHEMISTRY, NON-CALCULUS BASED PHYSICS, AREA OF CONCENTRATION IN ARTS & SCIENCES (AS)

Award: Associate of Science Degree
No. of credits required: 60
For more information: *Contact Professor S. Russell Seidel, Ph.D., 443-412-2166,* sseidel@harford.edu *(August 15th - June15th); or Admissions, 443-412-2109; or* stem@harford.edu.

Program Description

The chemistry program is designed to prepare students for transfer to a Bachelor's degree program in general chemistry, forensic chemistry, medicinal chemistry, environmental science/chemistry, and more. Chemists investigate the composition, structure and properties of substances and the transformations they undergo, through basic, as well as applied, research toward the development of new products and methods of producing new materials. They also work in biotechnology, drug development, forensic science, and other areas where a strong foundation in chemistry is essential.

Program Goals

Upon successful completion of the Associate of Sciences Degree, Option in Arts and Sciences, Chemistry, the student will be able to:

1. Explain and apply the fundamental principles of chemistry.
2. Perform laboratory experiments and projects (collect, report and analyze data) by applying theoretical concepts and the scientific method.
3. Demonstrate safe laboratory skills.
4. Recognize and discuss the ethical issues in the discipline.
5. Locate, identify, evaluate and use scientific information effectively.
6. Apply computational skills in reasoning, estimation, problem-solving, and analysis.
7. Use appropriate grammatical forms in both oral and written formats to effectively communicate ideas and concepts.

Transfer Information

Options for transfer into four-year programs include medicinal chemistry/ pre-pharmacy, general chemistry, forensic chemistry, and more. Students planning to transfer to a four-year college or university should check the requirements of that institution. If they differ significantly from those listed, students should consult with an advisor for academic guidance; it may be that a General Studies curriculum should be followed.

Employment Information

A Bachelor's degree in chemistry or a related discipline usually is the minimum educational requirement for entry-level chemist jobs. Job growth for chemists will be concentrated in pharmaceutical and medicine manufacturing companies and in professional, scientific, and technical services firms.

Degree Requirements

Recommended Course Sequence

First Semester		Credits
CHEM 111	General Chemistry I (GL)	4
ENG 101	English Composition (GE)	3
MATH 109	Precalculus Mathematics (GM)	4
Behavioral/Social Science Elective (GB) (https://catalog.harford.edu/general-education/#behavioral-social-science)		3
Physical Education Elective		1
	Credits	**15**
Second Semester		
Program Elective (p. 1)		4
CHEM 112	General Chemistry II A (GL)	4
MATH 203	Calculus I (GM)	4
Arts/Humanities Elective (GAH)		3
	Credits	**15**
Third Semester		
Program Elective (p. 1)		4
CHEM 207	Organic Chemistry I	4
MATH 204 or MATH 216	Calculus II (GM) or Introduction to Statistics (GM)	4
PHYS 101	Introductory Physics I (GL)	4
	Credits	**16**
Fourth Semester		
CHEM 208	Organic Chemistry II	4
PHYS 102	Introductory Physics II (GL)	4
Arts/Humanities Elective (GAH)		3
Behavioral/Social Science Elective (GB) (https://catalog.harford.edu/general-education/#behavioral-social-science)		3
	Credits	**14**
	Total Credits	**60**

Program Electives

Code	Title	Credits
BIO 120	General Biology I (GL)	4
MATH 206	Calculus III	4
MATH 208	Elementary Differential Equations	3
ENG 109	English Composition: Research Writing	3
CSI 131	Computer Science I	4
CSI 132	Computer Science II	4
BIO 208	Genetics	4
General Elective		1-4

General Education Degree Requirements

Note: The following codes identify courses which satisfy the General Education Degree Requirements:

Behavioral/Social Science (GB)
English Composition (GE)
Arts/Humanities (GAH)
Interdisciplinary and Emerging Issues (GI)

Biological/Physical Laboratory Science (GL)
Mathematics (GM)
Biological/Physical Science (GS)