

# MATHEMATICS - COMPUTER SCIENCE, Associate in Science Degree - 4030

Mathematics & Computer Science Department

CIP Code: 11.0701

The Mathematics-Computer Science AS program focuses on computer design, algorithm design, programming techniques, data structures, and a variety of programming languages. Since mathematical background is essential to success in this program, students must complete College Algebra or its equivalent to begin the program. Requirements of senior institutions vary widely, so it is essential to choose an intended transfer institution as soon as possible and carefully follow the program described in that college's catalog. Students completing this degree are admitted at the Junior-level to any institution participating in Pennsylvania's statewide college credit transfer system. Students may complete 75% of this program at the Harrisburg Campus through on-campus/in-person instruction. The remaining coursework must be completed through various modalities (e.g., hybrid, synchronous remote instruction and asynchronous instruction). Also, this program may be completed at the Lancaster and York campuses through various modalities (e.g., hybrid, synchronous remote instruction and asynchronous instruction) in addition to on-campus/in-person instruction.

## Transfer Opportunities

This transfer curriculum is provided as a guide for students planning to transfer to a baccalaureate degree granting institution.

## Competency Profile

The curriculum is designed to prepare students to:

- Analyze problem situations and create algorithms to solve those problems
- Use mathematical concepts and models to analyze data
- Select appropriate control structures, data structures, and abstract data types for implementing computer solutions
- Code computer programs that are effective, efficient, and accurate
- Work as part of a professional team to design, code, test, and debug mathematically based object-oriented computer software

## PROGRAM REQUIREMENTS (TOTAL CREDITS = 61)

General Education		Major Requirements		Other Required Courses	
ENGL 101 English Composition I	3	CIS 110 Introduction to Computer Systems (or)	3	BIOL 102 General Biology II (or)	4
ENGL 102 English Composition II (or)	3	CNT 120 Network Communications Technology	(3)	CHEM 102 General Inorganic Chem & Qualitative Analysis (or)	(4)
ENGL 104 Technical Writing	(3)	CPS 121 Computer Science I: Intro to Computer Programming JAVA	3	PHYS 202 General Physics II (or)	(4)
COMM 101 Effective Speaking	3	CPS 161 Computer Science II: Algorithmic Design JAVA & C++	3	PHYS 212 Physics for Engineers & Scientists II	(4)
Humanities & Arts Core Elective*	3	CPS 162 Computer Science III: Data Structures C++	3	Transfer Electives**	5
Mathematics Core Elective - MATH 121	4	CPS 230 Object Oriented Programming JAVA	3		9
Mathematics or Science Core Elective - MATH 202	4	MATH 125 Discrete Mathematics	4		
Science w/ a Laboratory Core Elective - BIOL 101, CHEM 101, PHYS 201 or 211	4	MATH 220 Linear Algebra	4		
Social & Behavioral Sciences Core Elective	3		23		
First-Year Seminar Elective	1				
Wellness Elective	1				
	29				

\*Students select courses from the following: ART 181, 182; ENGL 206; FMTH 101; HUM 101, 115, 201; MUS 104; PHIL 200; or a foreign language course.

\*\*Students are to select their Transfer Elective that are appropriate for their intended institution.

## RECOMMENDED SEQUENCE FOR FULL-TIME STUDENTS

Part-time students can complete this program by taking one or more courses each semester.

Fall Semester I		Spring Semester I		Fall Semester II		Spring Semester II	
COMM 101	3	CPS 161	3	BIOL 101, CHEM 101, PHYS 201 or 211	4	BIOL 102, CHEM 102, PHYS 202 or 212	4
CPS 121	3	ENGL 102 or 104	3	CPS 162	3	CIS 110 or CNT 120	3
ENGL 101	3	Humanities/Arts Core Elective*	3	MATH 220	4	CPS 230	3
FYS Elective	1	MATH 125	4	Social/Behavioral Science Core Elective	3	MATH 202	4
MATH 121	4	Transfer Elective**	3			Transfer Elective**	2
Wellness Elective	1						