

# Programming

## Degree Type Certificate

The Computer Technologies Department offers a Programming Certificate for students who want to develop the technical expertise for a career in backend, middle-tier programming or web application development. The core portion of the Certificate provides students with a solid foundation in programming fundamentals and database design. Students can focus on Java, C++, or C# as their development platform and then expand on their expertise by selecting electives in a particular area.

Successful completion of this program will allow students to seek employment in entry-level programming, quality assurance, technical support, or technical sales and integration.

## Program Outcomes

Students will be able to:

- Analyze a problem and identify/define the computing requirements appropriate to its solution.
- Design, implement and evaluate a computer-based process or program to meet desired needs.
- Use current techniques, skills, and tools necessary for computing practices.
- Demonstrate a familiarity with state-of-the-art programming techniques, tools, and practices.
- Demonstrate a solid foundation in the fundamental areas of computer science - which are algorithms, systems, and software - and exposure to multiple sub-disciplines of computer science.
- Understand professional, ethical, legal, security, and social issues and responsibilities related to IT, to include an understanding of cross-cultural issues and global perspectives.
- Use written and oral communication skills necessary to be effective in the IT industry.
- Recognize the need to maintain currency with future changes in the computing profession.
- Use creative and critical thinking processes to work independently and/or collaboratively to develop complex solutions and take the lead to implement those solutions.
- Function effectively on teams to accomplish a common goal.
- Through the use of an online portfolio, students will assess and reflect upon their own learning and create a cumulative portfolio of their "best" work.

*Note: The Programming Certificate is a rigorous program. Students are expected to spend additional time beyond the minimum to complete requirements and achieve success. Students are also required to have college level reading, writing and math skills prior to enrollment. CIS112G Introduction to Object Oriented Programming or permission of the program advisor is required before taking any CISXX8G course.*

## Technical Standards

Students enrolling in the Programming Certificate program must have college level writing, mathematics and technology skills. Completion of or placement into the following (or equivalents) will satisfy these prerequisites:

- ENGL110G or 111G for English proficiency
- MATH145G or 150G or higher for Math
- CIS107G/110G or 111G/112G/177G for fundamental technology and programming skills

## Certificate Requirements

Item #	Title	Theory Hours	Lab Hours	Credits
CIS113G	Database Design and Management	2	2	3
CIS124G	Web Development I	2	2	3
CIS224G	Web Development II	2	2	3
	CIS1X8G Introductory Programming course	2	2	3
	CIS2X8G Advanced Programming course	2	2	3
	<b>Sub-Total Credits</b>	<b>10</b>	<b>10</b>	<b>15</b>

## Elective Courses

### 9 Credits (Choose a minimum of 3 courses)

Students must take at least one introductory and advanced class in the language of their choice. Once they complete the advanced course, they may select another programming language for study. All of the programming classes listed as part of the core can also count toward an elective.

Item #	Title	Theory Hours	Lab Hours	Credits
CIS118G	Introduction to .NET	2	2	3
CIS134G	Web Style and Design	2	2	3
CIS146G	Linux I	2	2	3
CIS148G	Introduction to Java Programming	2	2	3
CIS158G	Introduction to C++	2	2	3
CIS177G	Introduction to Python	2	2	3
CIS216G	Web Server Administration	2	2	3
CIS218G	Advanced .NET	2	2	3
CIS223G	Advanced SQL	2	2	3
CIS246G	Linux II	2	2	3
CIS248G	Advanced Java Programming	2	2	3
CIS249G	Linux Databases	2	2	3
CIS253G	Data Sharing	2	2	3
CIS254G	PHP and MySQL	2	2	3
CIS258G	Advanced C++	2	2	3
CIS291G	Advanced Topics	2	2	3
	<b>Total Credits</b>			<b>24</b>