

**Computer Science Technology - Programming & App Development
 Certificate
 M.A.P.**

| Semester | Suggested Courses | Semester(s) Offered* | Credit Hours |
|--|---|----------------------|--------------|
| Semester 1 15 credit hours | CIS 149 Introduction to Computers | Fall | 3 |
| | CIS 191 Introduction to Computer Programming Concepts | Fall | 3 |
| | CIS 193A Introduction to Computer Programming Lab | Fall | 1 |
| | CIS 157 Introduction to App Development with Swift | Fall | 3 |
| | MTH 100 <i>or</i> Intermediate College Algebra <i>or</i> MTH 116 Mathematical Applications | Fall, Spring, Summer | 3 |
| | ORI 101 Orientation to College | Fall, Spring, Summer | 2 |
| Semester 2 13 credit hours | CIS 263 Computer Maintenance | Spring | 3 |
| | CIS 251 C++ Programming (Recommended CST Elective) | Spring | 3 |
| | CIS 193B C++ Programming Lab (Recommended CST Elective) | Spring | 1 |
| | CIS 220 App Development with Swift I (Recommended CST Elective) | Spring | 3 |
| | ENG 101 English Composition I | Fall, Spring, Summer | 3 |
| Semester 3** 3 credit hours | SPH 106 <i>or</i> Fundamentals of Oral Communication <i>or</i> SPH 107 Fundamentals of Public Speaking | Fall, Spring, Summer | 3 |
| Semester 4 10 credit hours Apple App Development Short-Term Certificate Achieved | CIS 159 Introduction to Graphic Design for Apps (Recommended CST Elective) | Fall | 3 |
| | CIS 227 App Development with Swift II (Recommended CST Elective) | Fall | 3 |
| | CIS 281 Systems Analysis and Design (Recommended CST Elective) | Fall | 3 |
| | CIS 193D Systems Analysis and Design Lab (Recommended CST Elective) | Fall | 1 |
| Semester 5 13 credit hours Programming & App Development AAS Achieved | CIS 207 Web Development | Spring | 3 |
| | CIS 249 Microcomputer Operating Systems | Spring | 3 |
| | CIS 255 Java Programming (Recommended CST Elective) | Spring | 3 |
| | CIS 193F Java Programming Lab (Recommended CST Elective) | Spring | 1 |
| | CST Elective Choose 1 Programming & App Development Elective | Fall, Spring | 3 |

*Course(s) may be offered in additional semesters, but are only assured to run in semester(s) indicated. It is **highly** recommended for course(s) to be completed in the semester(s) indicated.

Part-time and full-time students desiring to begin the CST program of study during a spring or summer semester should consult with an academic advisor to establish an alternate degree completion pathway.

**Students desiring not to enroll for a summer semester may complete one of the *Semester 3 Area I-V Requirements* during Semester 2 and the remaining *Semester 3 Area I-IV requirement* during Semester 4.