# CIS PROFESSIONAL IN C++ PROGRAMMING (CERTIFICATE E0714)

**Business Division**
**Certificate E0714**
The CIS Professional Certificate in C++ Programming prepares students for a career in computer programming. It is intended for returning CIS professionals with several years of experience or current students who have completed several CIS courses. Emphasis is placed on object-oriented programming, database programming and developing a graphical user interface. Students will demonstrate the ability to create business-oriented applications using both the C++ and Visual C++ programming languages; demonstrate effective object-oriented design techniques; write effective program documentation, and demonstrate program troubleshooting skills. Opportunities available after the completion of this certificate include programming for standalone applications, games and databases.

## Required Courses

| Course Prefix | Course Name | Units |
|---|---|---|
| CISP 10 | Principles of Object-Oriented Design | 2.5 |
| CISP 31 | Programming in C++ | 3 |
| CISP 31L | Programming in C++ Laboratory | 0.5 |
| CISP 34 | Advanced C++ Programming | 3 |
| CISP 34L | Advanced C++ Programming Laboratory | 0.5 |
| Choose one from the following sequences: | | 3.5 |
| CISD 11 & 11L | Database Management - Microsoft Access and Database Management - Microsoft Access Laboratory | |
| CISD 21 & 21L | Database Management - Microsoft SQL Server and Database Management - Microsoft SQL Server Laboratory | |
| CISD 31 & 31L | Database Management - Oracle and Database Management - Oracle Laboratory | |
| **Total Units** | | **13** |

CIS Program Website (http://www.mtsac.edu/cis/)

## Program Learning Outcomes
*Upon successful completion of this program, a student will be able to:*

- Create event-driven program, using Windows Forms.
- Connect C++ program to the database and incorporate SQL statements into C++ code.

Review Student Learning Outcomes (SLOs) (http://www.mtsac.edu/instruction/outcomes/sloinfo.html) for this program.