

## CSCE 240 - Advanced Programming Techniques

- **Credit Hours:** 3 hours
- **Contact Hours:** 3 lecture hours
- **Instructors:** Drs. Tang, Valafar
- **Required Textbooks:** Walter Savitch, *Absolute C++*, 6th edition, Addison Wesley, 2016.
- **Bulletin Description:** Pointers, memory management, advanced programming language structures, operator overloading, iterators, multiple inheritance, polymorphism, templates, virtual functions; Unix programming environment.
- **Prerequisites:** Grade of D or better in CSCE 215, grade of C or better in CSCE 146
- **Required Course** in CE, CIS, and CS
- **Course Outcomes:** Students will be able to:
  1. Independently design and implement C++ programs in a Unix environment
  2. Demonstrate mastery of pointers, iterators, memory management including object creation and destruction, and parameter passing in C++.
  3. Demonstrate mastery of object oriented programming concepts including: inheritance, polymorphism, operator overloading, template functions and classes, and the use of STL containers.
  4. Engage in program design and implementation in a team environment.

- **Student Outcomes addressed by course**

Program	Student Outcomes Addressed
Computer Engineering	5
Computer Information Systems	2, 5
Computer Science	2, 5

### Topics covered

1. Unix Programming Environment: Unix tools, C preprocessor, Make, Shell, I/O redirection, debugging.
2. Pointers: Pointer manipulation, functions and function pointers, virtual functions.
3. Basic class management: constructors, destructors, data hiding, container classes.
4. Memory management: object creation and destruction, memory leak.
5. Advanced C++ features: operator overloading, iteration, special containers. inheritance, code reuse, multiple inheritance, virtual functions, polymorphism, templates, template libraries.