

**TCSS 143 Master Syllabus**  
**Version: April 2013**  
**(Approved: 10 May 2013)**

**Course Title**

Fundamentals of Object-Oriented Programming Theory and Application

**Catalog Description**

Develops fundamental concepts and techniques for analysis, design, and implementation of computer programs using an object-oriented language. Includes recursive techniques and use of abstract data types. Prerequisite: a minimum grade of 2.0 in either TCSS 142, CSE 142, or TCES 201.

**Preconditions**

- Develop and implement programs involving the fundamental programming constructs (variables, types, expressions, assignment, simple I/O, conditional and iterative control structures, functions and parameter passing, structured decomposition).
- Develop and implement programs that use each of the following: arrays, strings, and objects.

**Student Learning Goals** (to be added to syllabus handed out to students)

- Implement a low-complexity program (3 or more interacting classes) which includes the use of interfaces and/or abstract classes, and polymorphism given some design guidance.
- Apply object-oriented design concepts and techniques such as inheritance, composition, encapsulation, abstraction, method overloading, method overriding, exception handling, and scope appropriately to the implementation of a program.
- Provide formal documentation for a program, e.g., Javadoc comments
- Use single and multidimensional arrays and basic abstract data types (lists, queues, sets) in the implementation of a program.
- Use a provided class given only its API
- Apply recursive techniques to solve problems

**CSS Degree Student Learning Outcomes that this course contributes to** (to be added to syllabus handed out to students)

- b. an ability to analyze a problem, identify and define the computing requirements appropriate to its solution;
- c. an ability to design, implement and evaluate a computer-based system, process, component, or program to meet desired needs;

- i. an ability to use current techniques, skills, and tools necessary for computing practice.

**UWT Student Learning Goals that this course contributes to** (to be added to syllabus handed out to students)

*Inquiry and Critical Thinking*

Students will acquire skills and familiarity with modes of inquiry and examination from diverse disciplinary perspectives, enabling them to access, interpret, analyze, quantitatively reason, and synthesize information critically.

**Topics covered**

- review of basic programming concepts
- review of single dimensional arrays and introduction to 2D arrays
- basic object-oriented programming concepts (classes, objects, encapsulation, abstraction, cohesion)
- inheritance, interfaces, abstract classes, polymorphism
- use of lists, stacks, queues, sets, and maps
- recursion
- searching and sorting

**Additional Information**

This course has an associated lab section that meets once per week in addition to the 2 lectures per week.

There is an optional 2 credit seminar workshop (TCSS 390A) associated with this course.

The textbook used in recent years:

*Building Java Programs Second Edition*, Stuart Reges and Marty Stepp, Addison Wesley, ISBN-10: 0-13-609181-4