



## SYRACUSE UNIVERSITY

### **CSE 283**

#### **Introduction to Object-Oriented Design**

**2020-2021**

**(3 credits)**

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**CSE 283** is a one-semester software-engineering course. The course focuses on software design principles. The course covers the design of computer programs including top-down and object-oriented design, analysis, testing, user interface, documentation, data structures and graphic I/O. Applications are drawn from science and engineering, and are programmed in C++ OR Java.

### **Course Outline**

**Week 1:** C Machine, Overview and Course Objectives; Course Overview and Student Expectations; A Virtual Machine - The C Machine; Higher Level Language and the C++ Superset

**Week 2:** Functional Decomposition - Classical Design; Problem Statement Analysis; Modularity - identifying small pieces; Testability

**Week 3:** Reuse - Object-Oriented Design; Calling functions to repeat operations; Difficulties in parameter passing; Global versus Local variables

**Week 4:** Object-Oriented Design: Class and Object Models; What are Objects?; What are Classes?; Multiplicity, Aggregation, Cardinality, and other relationships

**Week 5:** Object-Oriented Design: Dynamic and Functional Models; External and Internal Interaction with regard to Objects; What happens when? Dynamic Modeling Member Functions

**Week 6:** Encapsulation - Classes; Class Syntax; Constructors; Access Rights

**Week 7:** Overloading and Defaults; Use forms that are already known, for the convenience of the programmer; Defaults make parameter passing easier and more flexible; Operator Overloading

**Week 8:** Arrays of Objects; Classes are User defined types; Constructor Problems; Multi-dimensioned Arrays

**Week 9:** Pointers to Objects; Objects within Objects; Sharing objects: Passing by reference; Friends

**Week 10:** Inheritance; Refining the Class; Inheritance Syntax; Protection and Multiple Inheritance

**Week 11:** Dynamic Allocation and Recursion; New and Delete; Constructor Execution and Destructors; Recursion Example

**Week 12:** Polymorphism; Reuse more Classes; Virtual members; Abstract Classes

**Week 13:** Templates and Manipulators; What is a template? Ultimate Reuse? Linked List Example

**Week 14:** Java and the Internet; The Java Virtual Machine; Appellate; Enhanced Home Page Design

**Week 15:** Review and Final Exam

(Over)

Title/Author (Publisher)	Price Per Copy	Ordering Source
<i>Problem Solving with C++, 10<sup>th</sup> Edition;</i> Savitch, W. ISBN: 9780134448282	\$158.00	Pearson Phone: 800-848-9500
<i>Java Software Solutions: Foundations of Program Design, 9<sup>th</sup> Edition;</i> Lewis & Loftus (Addison-Wesley) ISBN: 9780134462028	\$158.00	Pearson Phone: 800-848-9500

Prices are subject to change.