

Computer Science 1361 – Computer Science I

Student Learning Outcomes

1. Students will become familiar with the basic syntax of the C++ programming language.
2. Students will learn how to create, compile, link, and run a program using the Microsoft Visual Studio integrated development environment.
3. Students will learn how to construct a program using one or more of the following structures: sequence, selection, and repetition.
4. Students will learn how to use functions.
5. Students will learn how to use one-dimensional arrays.

Course Content

Textbook: *Starting out with C++ From Control Structures through Objects*, Sixth Edition, by Tony Gaddis
The following chapters including the particular sections listed are covered. (See textbook “Contents”)

1. Introduction to Computers and Programming

- Why Program?
- Computer Systems: Hardware and Software
- Programs and Programming Languages
- What Is a Program made of?
- Input, Processing, and Output
- The Programming Process
- Procedural and Object-Oriented Programming

2. Introduction to C++

- The Parts of a C++ Program
- The cout Object
- The #include Directive
- Variables and Literals
- Identifiers
- Integer Data Types
- The char Data Type
- Floating-Point Data Types
- The bool Data Type
- Determining the Size of a Data Type
- Variable Assignments and Initialization
- Scope
- Arithmetic Operators
- Comments

3. Expressions and Interactivity

- The cin Object
- Mathematical Expressions
- When You Mix Apples and Oranges: Type Conversion
- Overflow and Underflow
- Type Casting
- Named Constants

- Multiple Assignment and Combined Assignment
- Formatting Output
- Formatted Input
- More Mathematical Library Functions
- Introduction to File Input and Output

4. Making Decisions

- Relational Operators
- The if Statement
- Flags
- Expanding the if Statement
- The if/else Statement
- Nested if Statements
- The if/else if Statement
- Logical Operators
- Checking Numeric Ranges with Logical Operators
- The Conditional Operator
- The switch Statement
- Testing for File Open Errors

5. Looping

- The Increment and Decrement Operators
- Introduction to Loops: The while Loop
- Using the while Loop for Input Validation
- Counters
- The do – while Loop
- The for Loop
- Keeping a Running Total
- Sentinels
- Using a Loop to Read Data from a File
- Nested Loops
- Breaking Out of a Loop
- The continue Statement

6. Functions

- Focus on Software Engineering: Modular Programming
- Defining and Calling Functions
- Function Prototypes
- Sending Data into a Function
- Passing Data by Value
- The return Statement
- Returning a Value from a Function
- Returning a Boolean Value
- Local and Global Variables
- Static Local Variables
- Default Arguments
- Using Reference Variables as Parameters
- Overloading Functions
- The exit() Function

7. Arrays

- Arrays Hold Multiple Values
- Accessing Array Elements
- No Bounds Checking in C++
- Array Initialization
- Processing Array Contents
- Arrays as Function Arguments

Additional Content

Any section or chapter not listed previously.