

South Central College

# COMP 1130 Programming Fundamentals

## Common Course Outline

### Course Information

<b>Description</b>	Programming Fundamentals teaches you how to design and develop small programs that solve different problems and implement ideas. In this class, you will discover how applications store and work with data, make decisions, and perform repetitive tasks. You will use and create functions, data structures, and objects, to represent the concepts from real life in your code. You will also use programming language libraries to develop efficient code that is easy to maintain. In the process of learning, we will emphasize testing, debugging, and scalability of your programs. (Prerequisites: COMP1120 Foundations of Computing)
<b>Total Credits</b>	4
<b>Total Hours</b>	64

### Types of Instruction

Instruction Type	Credits/Hours
Lecture	4/64

### Pre/Corequisites

Prerequisite           COMP1120 Foundations of Computing

### Institutional Core Competencies

Critical and Creative Thinking - Students will be able to demonstrate purposeful thinking with the goal of using a creative process for developing and building upon ideas and/or the goal of using a critical process for the analyzing and evaluating of ideas.

### Course Competencies

**1. Establish a working system for developing code.**

**Learning Objectives**

Write programs that are well-formed and well documented.  
Use an integrated development environment (IDE) to create, execute, test, and debug secure programs.

**2. Use proper language syntax in expressions and statements.**

**Learning Objectives**

Classify the elements of the programming language's syntax.

Utilize logical operators.

**3. Utilize data types.**

**Learning Objectives**

Compare and contrast the primitive data types of a programming language.

Describe how each primitive data type is stored in memory.

Identify the criteria for data type selection.

Use variables to store and work with data.

Explain the scope of variables.

**4. Implement control structures and logic in programming.**

**Learning Objectives**

Employ decision-making in your programs using if/else statements.

Construct repetitive tasv1 11.40 | s8

Identify different types of testing, including security, unit testing, system testing, integration testing, and interface usability.

**11. Utilize libraries to save time.**

**Learning Objectives**

Compare external libraries for ease of use, power, documentation.

Explain the programming library concept.

Use standard libraries for a given programming language.

Investigate the risks in using third-party applications, software tools, and libraries.

**12. Use strategies to work with other systems.**

**Learning Objectives**

Utilize application programming interfaces.

Use external data in your programs.

**13. Apply the program development process to problems that are solved using fundamental programming constructs and predefined data structures.**

**Learning Objectives**

Describe input/output programming.

Establish the steps in designing and implementing a program.

Diagram the phases of the secure software development lifecycle (SecSDLC).

Illustrate common behaviors that contribute to the effective functioning of a team.

Create modularized programs.

Use standard analysis and design techniques to produce a team-developed, medium-sized, secure software application that is fully implemented and formally tested.