Syllabus

CSC 117 Introduction To Programming And Computational Thinking using Python

General Information

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Course Prefix CSC

Course Number 117

Course Title Introduction To Programming And Computational Thinking using Python

Course Information

Catalog Description Introduction to Programming and Computational Thinking using Python serves as a first programming course for Networking & Cybersecurity majors. This course is for beginning programmers. The course emphasizes the development of languages and software, problem-solving, and programming in a structured, object-oriented language. The Python programming language is used throughout the course.

Credit Hours 3

Lecture Contact Hours 3

Lab Contact Hours 1

Other Contact Hours 0

Grading Scheme Letter

Prerequisites

None

Co-requisites

None

First Year Experience/Capstone Designation

This course DOES NOT satisfy the outcomes applicable for status as a FYE or Capstone.

SUNY General Education

This course is designated as satisfying a requirement in the following SUNY Gen Ed categories
None

FLCC Values

Institutional Learning Outcomes Addressed by the Course
Vitality, Inquiry, Perseverance, and Interconnectedness

Course Learning Outcomes

Course Learning Outcomes

1. Design computer algorithms to solve problems
2. Create and document computer programs using the formal syntax from a high-level, object-oriented programming language
3. Adopt an iterative and continuous improvement process to critically troubleshoot issues and elevate software design.

Outline of Topics Covered

- Fundamentals of Computer Problem Solving
  - Problem Analysis
  - Design Logic â€“ Simple Algorithmic Development
    - Flowcharts
    - Pseudocode
- Fundamentals of Computer Programming
  - Programming Languages and Environments
    - Object-Oriented versus Structured Programming and Functional Methodologies
    - Phases of Language Translation (Compiling, Interpreting, Linking, and Executing)
    - Python Language Specification: API and IDE
    - Error Conditions: Syntax, Runtime, and Logic
  - Software Development Process
    - Requirements
    - Specification
    - Analysis
    - Design
    - Implementation

        - Testing
        - Deployment
        - Maintenance
    - Creating, Compiling, and Executing a Python Program
        - Design standards, conventions, and commenting
        - Tokens, Identifiers, Variables, and Constants
        - Memory Representations and Data Types
        - Numeric, String, Boolean, Character, and other types as necessary
        - Assignment, Numeric, Relational and Logical Operators
        - Expression Evaluation: Assignment, Numeric, Boolean
        - Fundamental Programming Constructs
        - Sequence
        - Selection
        - Iteration
    - Standard classes and importing libraries
- Subprograms, Functions, and Methods
    - Formal Parameters, Actual Parameters
    - Passing Arguments and Return Values
    - Method Overloading
    - Developing Reusable Code
- Secure Coding Techniques
    - Variable Scope
    - Input Data Validation
- Arrays
    - Common Array Operations
        - Traversing backwards
    - Sorting and Searching