Syllabus

CSC 115 CS1: Introduction To Programming And Computational Thinking

General Information

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Department Computing Sciences

Course Prefix CSC

Course Number 115

Course Title CS1: Introduction To Programming And Computational Thinking

Course Information

Catalog Description CS1: Introduction to Programming and Computational Thinking serves as a first course for all computer-related majors. This course is for beginning programmers, and is the first course in a sequence of three programming courses. The course emphasizes the development of languages and software, problem-solving, and programming in a structured, object-oriented language. The Java 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

MAT 097 or Math Placement Level 1

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
None

Course Learning Outcomes

Course Learning Outcomes

1. Construct fundamental computer algorithms to solve simple problems

2. Create basic computer programs using the formal syntax from a high-level, object-oriented programming language

3. Translate foundational algorithms into simple technical computer program solutions

Outline of Topics Covered

I. Fundamentals of Computer Problem Solving

- Problem Analysis

- Design Logic – Simple Algorithmic Development

    I. Flowcharts

    II. Pseudocode

II. Fundamentals of Computer Programming

- Programming Languages and Environments

    I. Object-Oriented verses Structured Programming and Functional Methodologies

    II. Phases of Language Translation (Compiling, Interpreting, Linking, and Executing)

    III. Java Language Specification: API, JDK, and IDE

    IV. Error Conditions: Syntax, Runtime, and Logic

- Software Development Process (IPO)

    I. Requirements

    II. Specification

    III. Analysis

    IV. Design

    V. Implementation

    VI. Testing

    VII. Deployment

    VIII. Maintenance

- Creating, Compiling, and Executing a Java Program

    I. Identifiers, Variables, and Constants

    II. Memory Representations and Data Types

        I. Numeric, String, Boolean, Character

    III. Assignment, Numeric, Relational and Logical Operators

    IV. Expression Evaluation: Assignment, Numeric, Boolean

    V. Fundamental Programming Constructs

        I. Sequence

        II. Selection

        III. Iteration

- Subprograms, Functions, and Methods

    I. Formal Parameters, Actual Parameters

    II. Passing Arguments and Return Values

    III. Method Overloading

    IV. Developing Reusable Code

- Secure Coding Techniques

    I. Variable Scope

    II. Input Data Validation

- Arrays

I. Common Array Operations

II. Sorting and Searching