C-ID Descriptor
Introduction to Programming Concepts and Methodologies

Descriptor Details

- **Descriptor Title**: Introduction to Programming Concepts and Methodologies
- **C-ID Number**: 130
- **Units**: 3.0
- **Date of Last Revision**: 2/26/2025 06:54:22 PM GMT+0000

General Description

An introduction to the fundamental concepts and models of application development including the basic concepts of program design, data structures, programming, problem solving, programming logic, and fundamental design techniques for event-driven programs. Hands-on experience with a modern application programming language and development platform.

Prerequisites

None

Corequisites

None

Advisories

The course benefits from computer lab resources either in class or available for licensing on individual students' computers. The choice of language should reflect

commonly used languages and tools with the expectation that learning any language will generalize to other languages. For this reason it may be best to concentrate on one language to develop depth rather than breadth across several languages.

Content

1. Program design
2. Program development lifecycle
3. Requirements determinants and analysis
4. Modular design
5. Techniques for modeling program structures
6. Programming concepts
7. Variables
8. Literals
9. Types
10. Expressions
11. Procedures
12. Functions
13. Parameters
14. Operators and operations
15. Decision logic
16. Looping
17. Sub-procedures
18. Passing parameters
19. Coding
20. Unit testing
21. Control structures

Some the above material is taken from http://www.acm.org/education/curricula/IS%202010%20ACM%20final.pdf.

Lab Activities

No information provided

Objectives

At the conclusion of this course, the student should be able to:

1. use primitive data types and data structures offered by the development environment.
2. choose an appropriate data structure for modeling a simple problem.
3. identify basic programming concepts.
4. write simple applications that relate to a specific domain.
5. design, implement, test, and debug a program that uses each of the following fundamental programming constructs: basic computation, simple I/O, standard conditional and iterative structures, and the definition of functions.
6. test applications with sample data.
7. apply core program control structures.

Evaluation Methods

Evaluation will include hands-on projects and a combination of examinations, presentations, discussions, or problem-solving assignments.

Textbooks

- Liang, Y. - Introduction to Java Programming, Comprehensive Version
- Deitel, P. & Deitel, H. - How to Program
- Guttag, J. - Introduction to Computation and Programming Using Python: With Application to Understanding Data
- Gaddis, T. & Irvine, K. - Starting Out With Visual Basic
- Mansfield, R. - Mastering VBA for Microsoft Office
- Murach, M., Prince, A. & Menendez, R. - Murach's Mainframe COBOL