Course Synopsis: CSC 102 – Introduction to Problem Solving and Algorithms

Lagos State University  
Department of Computer Science  
100 Level – Second Semester  
Credit Units: 3

# Course Description / Synopsis:

This course introduces students to the fundamental principles of problem-solving using logical and structured methods. It focuses on algorithm design, representation (pseudocode and flowcharts), and the application of these algorithms to basic computational problems. Students will learn how to deconstruct problems, apply step-by-step logic, and implement algorithms using structured techniques, laying the groundwork for programming proficiency.

# Course Objectives:

* Define and explain what an algorithm is.
* Represent algorithms using pseudocode and flowcharts.
* Identify and apply algorithmic problem-solving strategies.
* Analyze simple problems and develop suitable algorithms.
* Understand recursion, sorting, and searching basics.
* Evaluate the efficiency of algorithms at an introductory level.

# Course Outline / Topics:

1. Introduction to Algorithms

* Definition, characteristics, and properties
* Examples in everyday life
* Difference between algorithms and programs

1. Problem-Solving Techniques

* Understanding problem statements
* Top-down design and modular approach
* Stepwise refinement

1. Algorithm Representation

* Pseudocode: syntax and structure
* Flowcharts: symbols, rules, and design

1. Control Structures in Algorithms

* Sequence
* Selection (if, if-else, nested if)
* Iteration (for, while, do-while)

1. Basic Algorithms

* Algorithms for arithmetic operations
* Searching algorithms (linear search, binary search)
* Sorting algorithms (bubble sort, selection sort)

1. Recursion

* Concept of recursion
* Simple recursive algorithms (e.g., factorial, Fibonacci)

1. Algorithm Efficiency (Introductory)

* Big-O notation basics
* Comparing algorithm efficiency

# Teaching Methods:

* Whiteboard explanations and live examples
* Flowcharting tools and software
* Hands-on algorithm exercises
* Group problem-solving tasks

# Assessment Methods:

Continuous Assessment: 30%  
- Quizzes  
- Assignments  
- Class exercises

Final Examination: 70%