
# JAVA PROGRAMMING
# COURSE SYLLABUS:

**Prerequisite:**

No prior knowledge about C++ is required, but people are expected to have some basic knowledge about computers, some knowledge about one or two other programming languages such as Perl, PHP, Python or Java etc is an advantage.

**Description:**

This course introduces computer programming using the JAVA programming language with object-oriented programming principles. Emphasis is placed on event-driven programming methods, including creating and manipulating objects, classes, and using object-oriented tools such as the class debugger.

## LEARNING OUTCOMES:

Upon completion of this course, the student will be able to:

a. Design, create, build, and debug Java applications and applets. Apply algorithmic thinking to solve programming problems.
b. Implement syntax rules in Java programs.
c. Explain variables and data types used in program development.
d. Apply arithmetic operations for displaying numeric output.
e. Write and apply decision structures for determining different operations. g. Write and apply loop structures to perform repetitive tasks.
f. Write user-defined methods.
g. Identify and implement arrays, array lists, and multidimensional arrays.
h. Write Java programs using object-oriented programming techniques including classes, objects, methods, instance variables, composition, inheritance, and polymorphism.
i. Write programs using graphical user interface (GUI) components and Java's Event Handling Model.

## OUTLINE OF INSTRUCTION:

### I. Introduction
- A. History of Java
- B. Features of Java
- C. How Java works
- D. Types of Java Programs
- E. Edit, compile, and run Java applications

### II. Variables, data types, and expressions
- A. Identifier rules
- B. Naming variables, constants (final) and references
- C. Primitive data types
- D. Arithmetic Operators
- E. Assignment Operators
- F. Relational and Logical Operators

### III. Program control flow
- A. Sequence structure
- B. Selection structure
- C. Repetition structure
- D. Jump (Sequence) structure

### IV. Methods
- A. Java API and Package/Library methods
- B. User-defined methods
- C. Scope and duration
- E. Pass-by-value, Pass-by-reference
- F. Recursion
- G. Overloading

### V. Arrays
- A. Declaration and allocation
- B. Passing arrays to methods
- C. Sorting, searching
- D. Multidimensional

### VI. Object-Based Programming
- A. Classes and objects, instance variables, and instance methods
- B. Member access modifiers: public, private, protected, package
- D. Constructors
- E. Overloaded constructors
- F. Final instance variables

### VII. Object-Oriented Programming
- A. Inheritance
- B. Super class, subclass
- C. Polymorphism

## VIII. Graphical User Interface

A. Event-Driven Programming and Event Handling Model
B. Window Components
C. Mouse and keyboard event handling
D. Adapter classes
E. Layout managers

## IX. MySQL

A. What is Database?
B. Understanding Tables, Records, and Fields
C. Using the MySQL Command-Line Client
D. Working with PHP MyAdmin
E. Creating Databases and tables
F. Specifying Field Data Types
G. Altering Table and Field Names
H. Adding and Removing Fields and Keys
I. Dropping Databases and Tables
J. Viewing Database, Table, and Field Information
K. SQL Queries, Inserting Records, Editing and Deleting Records
L. Filtering Records with a WHERE Clause
M. Sorting Records and Eliminating Duplicates

## IX. Java database connectivity (JDBC)

A. Connecting to a database
B. Submitting SQL statements
C. Retrieving and processing data

## X. Java reports

A. Creating reports.
B. Calling reports.
C. Dynamic reports

## X1. Building executable file

A. Creating a java executable file.
B. Installing tables in a database.
C. Creating your Installer.

## REQUIRED TEXTBOOKS AND MATERIALS:

Text to be assigned by the instructor each semester/session