

# IT-2650: JAVA PROGRAMMING

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## Cuyahoga Community College

**Viewing: IT-2650 : Java Programming**

**Board of Trustees:**

December 2023

**Academic Term:**

Fall 2024

**Subject Code**

IT - Information Technology

**Course Number:**

2650

**Title:**

Java Programming

**Catalog Description:**

Introduction to object-oriented programming using the Java programming language. Design, code, and debug Java applications. Other topics include GUI components, event handling, and exception handling.

**Credit Hour(s):**

4

**Lecture Hour(s):**

3

**Lab Hour(s):**

2

## Requisites

**Prerequisite and Corequisite**

IT-1050 Programming Logic.

## Outcomes

**Course Outcome(s):**

Design, write and test application using the latest Java syntax and object-oriented programming methodologies.

**Objective(s):**

1. Explain the core principles of object-oriented programming.
2. Demonstrate the ability to create user-defined types (classes) and instantiate programming objects.
3. Create object-oriented solutions that use class inheritance to create subclasses.
4. Utilize advanced object-oriented techniques, such as abstract classes and interfaces.
5. Design solutions implementing simple data structures such as a linked list or queue, to store and manage a collection of values.
6. Implement a search and sort algorithm, and explain the differences in their time complexities.
7. Demonstrate the ability to evaluate algorithms, to select a range of possible options to implement the algorithm in a particular context.
8. Analyze and apply recursive programming techniques.

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**Methods of Evaluation:**

1. Class participation and discussion
2. Oral and/or written reports
3. Lab Assignments

- 4. Exams
- 5. Quizzes

**Course Content Outline:**

- 1. Object-oriented programming
  - a. Terminology
  - b. Classes and Objects
  - c. Instantiation
  - d. Encapsulation
  - e. Composition
  - f. Inheritance
  - g. Polymorphism
  - h. Interfaces
  - i. Scope
- 2. Java language concepts
  - a. Terminology and syntax
  - b. Variables and constants
  - c. Data types
  - d. String methods
  - e. Operators
  - f. Exception handling
  - g. Garbage Collection
  - h. Java Virtual Machine
- 3. Methods
  - a. Parameters / Arguments
  - b. Returning values
  - c. Overloading
  - d. Constructor method
  - e. Recursion
- 4. Control structures
  - a. If - else statement
  - b. Switch statement
  - c. While statement
  - d. For statement
  - e. Do while statement
  - f. Nested structures
- 5. Arrays
  - a. Declaring and initializing
  - b. Searching arrays
  - c. Passing arrays to methods
  - d. Multidimensional arrays
- 6. Lists
  - a. ArrayList
  - b. LinkedList
  - c. Stack
  - d. Queue
- 7. Algorithm
  - a. Sort
  - b. Search
  - c. Evaluate
- 8. GUI
  - a. Controls
  - b. Arrangement / Alignment
  - c. Frameworks / Environments
  - d. Canvas
- 9. Files
  - a. Reading
  - b. Writing

- c. Text files
- d. Serialized files

## Resources

Farrell, J. (2022) *Java programming*, Cengage.

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Savitch, W. J., & Mock, K. (2006) *Absolute Java*, Addison-Wesley.

---

Liang, Y. D. (2020) *Introduction to Java programming and data structures, comprehensive version*, Pearson.

---

Horstmann, C. S. (2021) *Core Java: Fundamentals, Volume 1*, Oracle Press.

---

Lewis, J., DePasquale, P., Chase, J. (2019) *Java Foundations: Introduction to Program Design and Data Structures*, Pearson.

---

Gaddis, T., Muganda, G. (2019) *Starting Out with Java: From Control Structures through Data Structures*, Pearson.

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## Resources Other

Oracle (n.d.). Dev.Java. Dev.Java. <https://dev.java/>

Oracle (n.d.). Java SE at a Glance. Java SE at a Glance. <https://www.oracle.com/java/technologies/java-se-glance.html>

Oracle, King's College London (n.d.). BlueJ Java Development Environment. BlueJ. <https://www.bluej.org>

Apache Software Foundation (n.d.). Apache NetBeans. <https://netbeans.apache.org>

Microsoft (n.d.). Visual Studio Code. <https://code.visualstudio.com>

JetBeans (n.d.). IntelliJ IDEA. <https://www.jetbrains.com/idea/>

Replit, Inc. (n.d.). Replit. <https://replit.com>

## Instructional Services

### OAN Number:

Transfer Assurance Guide OCS001

### CTAN Number:

Career Technical Assurance Guide CTPROG002

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