

Java Fundamentals – Course Description

Overview

This course engages students with little or no programming experience to create Java programs. Participants are introduced to object-oriented programming concepts, terminology, and syntax, and the steps required to create basic Java programs using the Alice, Greenfoot, and Eclipse interactive development environments. Hand-on practices figure prominently throughout this course so students can experience firsthand the power of computer programming.

Available Curriculum Languages:

- Arabic, Simplified Chinese, English, French, Indonesian, Japanese, Brazilian Portuguese, Spanish

Duration

- Recommended total course time: 90 hours*
- Professional education credit hours for educators who complete Oracle Academy training: 30

** Course time includes instruction, self-study/homework, practices, projects and assessment*

Target Audiences

Educators

- College/university faculty who teach computer programming, information communications technology (ICT), or a related subject
- Secondary school teachers who teach computer programming

Students

- Students with little programming experience who wish to learn Java programming and build their Object Oriented Programming experience using fun Java development environments
- This course is a suitable foundational class for computer science majors

Prerequisites

Required

- Basic understanding of at least one programming language
- The ability to follow software installation instructions and install Alice, Greenfoot, and Eclipse on a computer

Suggested

- Getting Started with Java Using Alice and Creating Java Programs with Greenfoot or previous experience with at least one programming language

Suggested Next Courses

- Java Programming

Lesson-by-Lesson Topics

Introduction

- Introduction

Using Alice 3

- Getting Started with Alice 3
- Add and Position Objects
- Procedures and Arguments
- Rotation and Randomization
- Declare Procedures
- Control Statements
- Functions
- IF and WHILE Control Structures
- Expressions
- Variables
- Keyboard Controls
- Develop a Complete Animation
- Java Variables and Data Types
- Java Methods and Classes

Using Greenfoot

- Getting Started with Greenfoot
- Methods, Variables and Parameters
- Source Code and Documentation
- Developing and Testing an Application
- Randomization and Understanding Dot Notation and Constructors
- Defined Methods
- Sound and Keyboard Control
- World Animation and Game End
- Abstraction
- Loops, Variables, and Arrays

Java Basics

- Getting Started with Eclipse
- Object and Driver Classes
- Data Types and Operators
- Strings

Program Structure

- Scanner and Conditional Statements
- Control Statements

Arrays and Exceptions

- Arrays
- Handling Errors

Java Classes

- Classes, Objects, and Methods
- Parameters and Overloading Methods
- The Static Modifier and Nested Classes
- Inheritance
- Polymorphism