



Intro to Computer Science 9-12 Syllabus

Course Goals

1 Basic Java Knowledge

Students create basic console programs in Java.

2 Object-Oriented Programming

Students understand the concepts of object-oriented programming, including inheritance and polymorphism.

3 Create Basic GUI in Java

Students learn how to create a basic GUI in Java using the Swing API.

Course Topics

1 Java Syntax

Students learn Java syntax and how to document their code using comments.

2 Program Control

Students learn basic Java operators, conditional statements, and iteration.

3 Java Libraries

Students learn about the Java Class Library and how to utilize several libraries to perform various coding tasks.

4 Java Class Hierarchy and Polymorphism

Students learn the fundamentals of Object-Oriented Programming and how to create a class hierarchy diagram.

5 Java Windows and UI Elements

Students use the Swing API to create a Java window with components such as buttons and drawings.

Course Schedule

Day 1

Class Introduction

Students get to know each other and learn the basics of this course.

Introduction to Java

Students learn some background information about Java and its syntax.

Project: Hello, World!

Students write code for their first program.

Variable Types

Students learn about the primitive data types: int, double, boolean, and char.

Day 2

Operators

Students learn about the different kinds of operators in Java.

Java Packages and Libraries

Students learn about Java packages and about two classes from the Java Class Library: String and Math.

Project: Quadratic Formula

Students create a program that solves the Quadratic Formula.

Day 3

Iteration

Students learn how to iterate over code multiple times using loops.

Project: Slot Machine Game

Students create a simple slot machine game.

Day 4

Arrays

Students learn how to store collection of data using arrays.

Methods

Students learn how to write methods.

Project: Sorting Algorithms

Students learn how to write basic sorting algorithms.

Day 5

Object-Oriented Programming

Students learn the basics of Object-Oriented Programming, including how to write a class.

Project: Coffee Shop

Students create a program that tracks the inventory of a coffee shop.

Day 6

Inheritance and Polymorphism

Students continue learning about Object-Oriented Programming including parent and child classes.

Project: Shapes

Students create classes for 2D and 3D shapes that can calculate their own area and perimeter.

Day 7

Drawing with Java Graphics

Students learn how to draw primitive shapes in Java.

Project: Drawing a House

Students create a program that draws a house using primitive shapes.

Day 8**Basic Java GUI**

Students learn how to create a basic GUI in Java using the Swing library.

Project: Simple Counter

Students create a program that counts the number of people in a movie theater as they enter and leave.

Day 9**Final Project: 21 Sticks**

Students combine everything they've learned to write a game: 21 Sticks.

Day 10**Course Wrap-Up**

Students try each other's final projects, then gather their work to bring home with them.

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