

Introduction to Java

General Information

Description

This course teaches students how to code by using the Java programming language. Java is considered to be the father of many current programming languages. Its object-oriented nature makes Java an excellent beginning programming language. In addition, it is an excellent gateway to other programming languages since it is very good at laying down core foundations for proper programming practices. The course will prepare students to become strong programmers in the Java programming language.

Expectations and Outcomes

By learning Java, students are expected to have strong foundational skills in programming. Knowing Java is practically mandatory for anyone wishing to pursue software development. Here are some additional outcomes:

- Students can plan and develop algorithms to solve problems.
- Students can explain the foundational principles of object-oriented programming such as encapsulation and information hiding.
- Students understand good programming practices and paradigms.
- Students can recognize the impact and importance of technology in their daily lives.
- Students can work collaboratively to create solutions for problems.
- Students will become knowledgeable about programming and explore further opportunities that programming provides.

Course Materials

Prerequisites

- None
- Algebra I may be preferred but not necessary

Device Requirements

Any device with Internet connection is sufficient.

Additional Information and Resources

Course Length	Delivery Method	Recommended Age Group
60 hours / 1 Semester	Online / Classroom	Middle - High School (Ages 12+)

Certifications Offered

Microsoft Introduction to Programming Using Java

Oracle Professional Java SE Developer

Pathway Alignment



Standards Aligned

CSTA
ISTE
K-12 Framework
Common Core

Attention to Equity and Diversity

Rex Academy is dedicated to bringing this course to all interested students, regardless of their background or the zip code in which they reside.

As such, special attention has been given to the curriculum in the following manner:

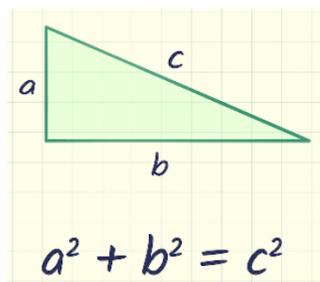
1. Rex Academy's Java content can run on any device (Chromebooks, tablets, phones, PCs, etc). The Internet connection needs to be minimal. We are determined to remove all obstacles for access.
2. The compiler and the code editor are also entirely online based, removing the need for any hardware or software configuration.
3. The course can be conducted in a direct classroom setting or in an after-school environment. Students can learn in groups or individually.
4. Instruction and assessment are performed in various ways, thus accommodating various learning styles.

Interdisciplinary Instruction

Rex Academy combines technology instructional materials with common core alignment to infuse other disciplines into the curriculum.

In the case of Java, here is Homework 3 from Chapter 2.

Consider the Pythagorean theorem



Ask the user to enter values for a and b. Write a program that will solve for c, or the hypotenuse of a triangle.

As you can see, Rex has built geometry standards into this programming lab.

Course Syllabus

Unit Number	Topic	Brief Description
Lesson 1	Basic Input and Output	<p>Students understand what Java is and what it can do.</p> <p>Students understand the nature of a variable and how it works.</p> <p>Students can utilize input and output as numbers and strings from the console terminal.</p>
Lesson 2	The Math Library	<p>Students can perform mathematical operations on numbers. They understand the nature of PEMDAS.</p> <p>Students can use the various math functions from the math library.</p> <p>Students can generate random numbers of a specific range and utilize them.</p>
Lesson 3	Strings	<p>Students know how to use the string data type, for both input and output.</p> <p>Students can concatenate (link) and slice strings for desired results.</p> <p>Students can use some of the built-in functions for strings to accomplish desired goals</p>
Lesson 4	Boolean Conditions and the 'if' Statement	<p>Students will learn Boolean values, logical operators, and logical operands.</p> <p>Students can use 'if' statements to write logical tests for data.</p> <p>Students can use 'if- else if -else' chain statements to write complicated conditionals.</p>
Lesson 5	The 'for' Loop	<p>Students will learn to use the 'for' loop along with different iteration schemes</p>
Lesson 6	The 'while' and 'do-while' Loops	<p>Students will learn to use the 'while' loop along with different iteration schemes</p>

Unit Number	Topic	Brief Description
Lesson 7	Major Project - Wheel of Fortune	Students will program the Wheel of Fortune as described in their program function.
Lesson 8	Arrays	Students will learn to use arrays. This includes how to assess values, manipulate indexes, and other important functions.
Lesson 9	Exam Preparation	Students will take a practice exam. Additional materials are provided to prepare for the certification exam.

