



Advanced Java Programming

Course Overview

This course introduces students to intermediate and advanced features of the Java programming language. Students will learn about object-oriented programming concepts such as inheritance, interfaces, abstract classes, abstract methods, and polymorphism, will learn how to write and read Java primitive types to and from files, how to serialize objects, and how to implement graphical user interfaces using Java's FX components. Typical assignments, exercises, and projects include using built-in and programmer-defined classes, implementing inheritance and runtime polymorphism, and implementing graphical user interfaces with components like buttons, check boxes, scroll bars, and lists. At the end of the course, students submit a comprehensive final examination.

The course syllabus provides an outline of the course that can be used as a guide when progressing through the learning topics of the course. Students are encouraged to take full advantage of discussion forums and other course activities online that can be helpful in their studies.

Course Materials

The core textbook for the course can be purchased online.

Introduction to Java Programming, Comprehensive Version, by Y. Daniel Liang [10th Edition, Prentice Hall, 2014] ISBN 01337613123

Students who have the previous edition of the textbook can continue to use it. Reading assignments for each unit are listed for both editions.

Course Grading and Assessment

Students will receive grades for assignments, quizzes, the final project and the final exam. Assignments are evaluated on effort and accuracy. Point values are as follows:

Assignments	33 points (3 points each)
Unit Quizzes	33 points (3 points each)
Final Exam	14 points
Projects	<u>20 points</u>
TOTAL =	100 points*

A+	100-98%	B+	89-87%	C+	77-79
A	97-93%	B	86-83%	C	73-76
A-	92-90%	B-	82-80%	C-	70-72

* Students must receive a score of 70 percent (70 points) or above to pass the course

Course Schedule

Unit 1: Inheritance --- Part 1

Introduction to Inheritance
Inheritance & Class Visibility
Base Class Constructors
Method Overriding
Preventing Inheritance
Runtime Polymorphism
 Reading: Chapter 11.1 – 11.10
 (9th Edition) Chapter 11.1 – 11.10

Unit 2: Inheritance --- Part 2

Abstract Methods & Abstract Classes
The Object Superclass
Casting Objects
Inheritance Design Guidelines
 Reading: Chapter 11.1 – 11.10, 13
 (9th Edition) Chapter 11.1 – 11.10, 15

Unit 3: Interfaces

Introduction to Interfaces
Defining & Using Interfaces
Interfaces & Polymorphism
Using Constants in Interfaces
 Reading: Chapter 13
 (9th Edition) Chapter 15

Unit 4: Exception Handling

Introduction to Exceptions
The Java Exception Hierarchy
Handling Exceptions
Defining & Throwing Exceptions
 Reading: Chapter 12.1 – 12.9
 (9th Edition) Chapter 14.1 – 14.9

Unit 5: File Input & Output --- Part 1

Working With Files & Directories
Java Streams
Writing Text Files
Reading Text Files
 Reading: Chapter 12.10 – 12.13
 (9th Edition) Chapter 14.10 – 14.12

Unit 6: File Input & Output --- Part 2

Writing Binary Files
Reading Binary Files
Writing Random Access Files
Reading Random Access Files
 Reading: Chapter 17
 (9th Edition) Chapter 19

Unit 7: Object Serialization

Writing Objects to Files
Reading Objects From Files
Some Serialization Issues
 Reading: Chapter 17
 (9th Edition) Chapter 19

Unit 8: Java Collections & Generics

Collections & Generics
Working With The ArrayList Class
Working With The LinkedList Class
Working With Map Classes
 Reading: Chapters 11.11 – 11.12, 19, 20, 21
 (9th Edition) Chapter 11.1 – 11.12, 21, 22, 23

Unit 9: Java Threads

Java Threads
Creating Threads
Manipulating Threads
Synchronizing Threads
 Reading: Chapter 30
 (9th Edition) Chapter 32

Unit 10: Working With GUI Components - 1

Introduction to Java FX
Adding Labels & Text Fields
Adding Buttons
Working With Layout Managers
 Reading: Chapter 15, 16.1 – 16.9
 (9th Edition) None

Unit 11: Working With GUI Components - 2

Handling Java Events
Working With Radio Buttons
Working With Check Boxes
Working With The ListView Control
Working With Combo Boxes
 Reading: Chapter 15, 16.1 – 16.9
 (9th Edition) None

Unit 12: Finishing Up

Final Project

Final Exam Instructions

Final Exam

Assignments

There will be 11 assignments for this course. Each of these assignments is based on information from the textbook and lessons. Be sure to follow the assignment instructions carefully and make a checklist of all required components before submitting.

Unit Quizzes

There are quizzes for each unit that will consist of content from the textbook and lessons.

Final Exam

The final exam will be based on content from the textbook and lessons. All assignments must be submitted and quizzes must be taken prior to taking the final exam.

Final Project

There is one final project. The project will be released by your instructor after completion of Unit 11. The project must be done individually and the work must be your own. Students may, however, discuss ideas and share course-related information on the discussion forums of the course.

Student Collaboration

No collaboration is permitted on quizzes and exams. Passwords for exams/projects should not be shared. You may discuss labs/assignments/projects with other students but these discussions should be limited to broad, conceptual questions. You are also allowed to discuss more detailed questions regarding the design and implementation of your programs. However, you are not allowed to share or copy code under any circumstances. For example, it is permitted for one student to ask another student how he/she did something or to ask for help debugging a problem in his/her code; it is not permitted for a student to take another student's code or to let another student write code for him/her. Using the Internet for reference purposes is allowed for assignments but copying code found online is not allowed. Once you have finished the course, sharing your work with future students taking the course is also a violation of the [CTYOnline Student Code of Conduct](#).

Accommodations for Disabilities

Students may request any accommodations required due to a disability by contacting ctydisabilities@jhu.edu. You can also visit CTY's [disability services](#) at <http://cty.jhu.edu/ctyonline/about/disability.html> for more information.