ITT Technical Institute

SD1420T

Introduction to Java Programming

Online Course

SYLLABUS

Credit hours: 4.5

Contact/Instructional hours: 67 (41 Theory Hours, 26 Lab Hours)

Prerequisite(s) and/or Corequisite(s):

Prerequisite: PT1420T Introduction to Programming or equivalent

Course Description:

This course introduces fundamentals of programming using Java and associated development tools and environments.

COURSE SUMMARY

COURSE DESCRIPTION

This course introduces fundamentals of programming using Java and associated development tools and environments.

MAJOR INSTRUCTIONAL AREAS

1. Introduction to Computers, Programming, and Java
2. Primitive Data Types, Arrays, and Operations
3. Control Structures
4. Methods
5. Objects and Classes
6. Object-Oriented Design
7. Inheritance and Polymorphism
8. Exception Handling in Java
9. Text I/O
10. Abstract Classes and Interfaces
11. Event-Driven Programming
12. GUI Basics and Creating User Interfaces

COURSE LEARNING OBJECTIVES

By the end of this course, you should be able to:

1. Describe the fundamentals of the Java programming language.
2. Write Java programs that use common control structures, such as selection statements, loops, and recursion.
3. Write Java programs that sort data by using arrays.
4. Write Java programs that make use of user-defined objects, classes, and methods.
5. Develop applications using the object-oriented design approach.
6. Implement inheritance and polymorphism in Java programs.
7. Develop the Graphical User Interface (GUI) for Java applications.
8. Develop Java applications that utilize File I/O to persist data between executions.

9. Develop testable and reusable application through the implementation of abstract classes and interfaces.
10. Implement the event-driven programming Java Applications.

COURSE OUTLINE

MODULE 1: JAVA BASICS

COURSE LEARNING OBJECTIVES COVERED

- Describe the fundamentals of the Java programming language.

TOPICS COVERED

- Java Basics
- Eclipse Software
- Software Development Process
- Comparison of Programming Environments

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Liang, Chapters 1 and 2.	No	9 hr
Lesson: Study the lesson for this module.	No	1 hr
Discussion: Participate in the discussion titled "Software Naming Conventions."	Yes	1 hr
Lab: Complete the lab titled "Command Line Tasks."	Yes	N/A
Quiz: Prepare for Quiz 1.	No	1 hr

Total Out-Of-Class Activities: 12 Hours

MODULE 2: CONTROL PROGRAM EXECUTION

COURSE LEARNING OBJECTIVES COVERED

- Write Java programs that use common control structures, such as selection statements, loops, and recursion.

TOPICS COVERED

- Java If and Else Statement
- Common Errors
- Java Loop Statement
- Java Methods
- Recursion
- Iteration

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Liang, Chapters 3–5 and Chapter 20.	No	14.5 hr
Lesson: Study the lesson for this module.	No	2.5 hr
Lab 1: Complete the lab titled "Control Structures."	Yes	N/A
Lab 2: Complete the lab titled "Loops."	Yes	N/A
Exercise: Submit the exercise titled "Debugging Programs with Loops and Switches."	Yes	2 hr
Quiz: Take Quiz 1.	Yes	N/A
Quiz: Prepare for Quiz 2.	No	1 hr

Total Out-Of-Class Activities: 20 Hours

MODULE 3: ARRAYS, OBJECTS AND CLASSES, AND STRINGS

COURSE LEARNING OBJECTIVES COVERED

- Write Java programs that sort data by using arrays.
- Write Java programs that make use of user-defined objects, classes, and methods.

TOPICS COVERED

- Java Arrays
- Two-Dimensional Arrays
- Java Classes
- The Null Value
- Static Variables, Constants, and Methods
- GUI Components
- Java Questions
- String Class
- String Components

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Liang, Chapters 6–9.	No	15.5 hr
Lesson: Study the lesson for this module.	No	2.5 hr
Discussion: Participate in the discussion titled "Arrays, Objects, and Classes."	Yes	1 hr
Lab 1: Complete the lab titled "Working with Arrays."	Yes	N/A
Lab 2: Complete the lab titled "Working with Objects and Classes."	Yes	N/A
Quiz: Take Quiz 2.	Yes	N/A
Quiz: Prepare for Quiz 3.	No	1 hr

Total Out-Of-Class Activities: 20 Hours

MODULE 4: OBJECT-ORIENTED PROGRAMMING AND GUI BASICS

COURSE LEARNING OBJECTIVES COVERED

- Develop applications using the object-oriented design approach.
- Implement inheritance and polymorphism in Java programs.
- Develop the Graphical User Interface (GUI) for Java applications.

TOPICS COVERED

- Scope of Variables
- Designing a Class
- Abstraction and Encapsulation
- Superclass and Subclass
- Constructor Chaining
- Overriding and Overloading
- Polymorphism and Dynamic Binding
- The ArrayList Class
- GUI Components
- GUI Layout

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Liang, Chapter 10–12.	No	13.5 hr
Lesson: Study the lesson for this module.	No	2.5 hr
Discussion: Participate in the discussion titled “Designing Class.”	Yes	1 hr
Lab 1: Complete the lab titled “Superclass and Subclass.”	Yes	N/A
Lab 2: Complete the lab titled “Creating a UI.”	Yes	N/A
Quiz: Take Quiz 3.	Yes	N/A
Quiz: Prepare for Quiz 4.	No	1 hr

Total Out-Of-Class Activities: 18 Hours

MODULE 5: EVENT-DRIVEN PROGRAMMING AND ERROR HANDLING

COURSE LEARNING OBJECTIVES COVERED

- Develop Java applications that utilize File I/O to persist data between executions.
- Develop testable and reusable application through the implementation of abstract classes and interfaces.
- Implement the event-driven programming Java Applications.

TOPICS COVERED

- Exception Types
- Exception Handling
- The File Class
- Abstract Classes
- Interfaces
- Inner Classes
- Mouse Events

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Liang, Chapters 14–16.	No	14 hr
Lesson: Study the lesson for this module.	No	2.5 hr
Lab 1: Complete the lab titled “Exception Handlers.”	Yes	N/A
Lab 2: Complete the lab titled “Abstract Classes and Event-Driven Programming.”	Yes	N/A
Exercise: Submit the exercise titled “Error Handling.”	Yes	2 hr
Quiz: Take Quiz 4.	Yes	N/A

Total Out-Of-Class Activities: 18.5 Hours

MODULE 6: MORE GUI PROGRAMMING WITH TEXT-BASED I/O

COURSE LEARNING OBJECTIVES COVERED

- Develop the Graphical User Interface (GUI) for Java applications.
- Develop Java applications that utilize File I/O to persist data between executions.

TOPICS COVERED

- Listeners
- Multiple-Line Text
- Value Selection Over a Range
- Display Multiple Windows in an Application
- Recursive Methods
- Relationship and Difference Between Recursion and Iteration

MODULE LEARNING ACTIVITIES	GRADE D	OUT-OF-CLASS TIME
Reading: Liang, Chapters 17 and 19.	No	3.5 hr
Lesson: Study the lesson for this module.	No	2.5 hr
Lab: Complete the lab titled “Programming for Text-Based I/O.”	Yes	N/A
Final Exam: Prepare for the final exam.	No	5 hr
Final Exam: Take the final exam.	Yes	N/A

Total Out-Of-Class Activities: 11 Hours

EVALUATION AND GRADING

EVALUATION CRITERIA

The graded assignments will be evaluated using the following weighted categories:

CATEGORY	WEIGHT
Discussion	15%
Lab	35%
Exercise	10%
Quiz	20%
Final Exam	20%
TOTAL	100%

GRADE CONVERSION

The final grades will be calculated from the percentages earned in the course, as follows:

GRADE	PERCENTAGE
A (4.0)	90–100%
B+ (3.5)	85–89%
B (3.0)	80–84%
C+ (2.5)	75–79%
C (2.0)	70–74%
D+ (1.5)	65–69%
D (1.0	60–64%

)	
F (0.0)	<60%

LEARNING MATERIALS AND REFERENCES

REQUIRED RESOURCES

COMPLETE TEXTBOOK PACKAGE

- Liang, Y. D. (2013). *Introduction to java programming, brief version (9th ed.). Upper* Saddle River, NJ: Addison Wesley.
- Reese, R. Lai, D. (2013). *Introduction to java programming student lab manual (1st ed.).* Boston, MA: Pearson Custom.

OTHER ITEMS

- Java SDK: JDK 7.0 or later (http://www.oracle.com/technetwork/java/javase/downloads/index.html)
- VMware Player 5.2 (or later) (https://my.vmware.com/web/vmware/free#desktop_end_user_computing/vmware_player/6_0)
- Microsoft Visio 2003 (or later)

Note: You can download Microsoft Visio from the DreamSpark website. Refer to the DreamSpark Installation Guide for download instructions.

RECOMMENDED RESOURCES

- Books and Professional Journals
  - Eclipse Developer's Journal (http://eclipse.sys-con.com/)
  - Software Developer's Journal (http://sdjournal.org/)
- ITT Tech Virtual Library (accessed via Student Portal | https://studentportal.itt-tech.edu)
  - Basic Search>
    - Bryant, J. (2012). *Java 7 for absolute beginners. Apress.*
    - Ernest, M. (2013). *Java se7 programming essentials. Sybex.*
    - Rischpater, R. (2008). *Beginning Java ME platform. Apress.*
    - Schildt, H. (2012). *Herb Schildt's Java programming cookbook. McGraw-Hill.*
- Other References
  - Java Developers Site (http://java.com/en/download/faq/develop.xml)
  - Java Tutorials (http://java.sun.com/docs/books/tutorial/collections/intro/index.html)
  - Rose India Java Tutorials (http://www.roseindia.net/java/jdk6/index.shtml)

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INSTRUCTIONAL METHODS AND TEACHING STRATEGIES

The curriculum employs a variety of instructional methods that support the course objectives while fostering higher cognitive skills. These methods are designed to encourage and engage you in the learning process in order to maximize learning opportunities. The instructional methods include but are not limited to lectures, collaborative learning options, use of technology, and hands-on activities.

To implement the above-mentioned instructional methods, this course uses several teaching strategies, such as lessons and hands-on labs. Your progress will be regularly assessed through a variety of assessment tools including discussions, quizzes, labs, exercises, and a final exam.

OUT-OF-CLASS WORK

For purposes of defining an academic credit hour for Title IV funding purposes, ITT Technical Institute considers a quarter credit hour to be the equivalent of: (a) at least 10 clock hours of classroom activities and at least 20 clock hours of outside preparation; (b) at least 20 clock hours of laboratory activities; or (c) at least 30 clock hours of externship, practicum or clinical activities. ITT Technical Institute utilizes a “time-based option” for establishing out-of-class activities which would equate to two hours of out-of-class activities for every one hour of classroom time. The procedure for determining credit hours for Title IV funding purposes is to divide the total number of classroom, laboratory, externship, practicum and clinical hours by the conversion ratios specified above. A clock hour is 50 minutes.

A credit hour is an artificial measurement of the amount of learning that can occur in a program course based on a specified amount of time spent on class activities and student preparation during the program course. In conformity with commonly accepted practice in higher education, ITT Technical Institute has institutionally established and determined that credit hours awarded for coursework in this program course (including out-of-class assignments and learning activities described in the “Course Outline” section of this syllabus) are in accordance with the time-based option for awarding academic credit described in the immediately preceding paragraph.

ACADEMIC INTEGRITY

All students must comply with the policies that regulate all forms of academic dishonesty or academic misconduct. For more information on the academic honesty policies, refer to the Student Handbook and the School Catalog.

INSTRUCTOR DETAILS

Instructor Name	
Office Hours	
Contact Details	

(End of Syllabus)