ITT Technical Institute

SD2620

Advanced Software Development Using Java

Onsite and Online Course

SYLLABUS

Credit hours: 4.5

Contact/Instructional hours: 56 (34 Theory Hours, 22 Lab Hours)

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

Prerequisite: SD2550 Application Development Using Java I or equivalent

Course Description:

This course is an intensive study that includes the industry standards and practices related to software development using the Java programming language as described by the Oracle Certified Associate Java SE8. Instruction will include object-oriented programming as well as design and implementation of functional software solutions. This course examines the concepts found in the Oracle Certified Associate Java SE8 certification exam.

COURSE SUMMARY

COURSE DESCRIPTION

This course is an intensive study that includes the industry standards and practices related to software development using the Java programming language as described by the Oracle Certified Associate Java SE8. Instruction will include object-oriented programming as well as design and implementation of functional software solutions. This course examines the concepts found in the Oracle Certified Associate Java SE8 certification exam.

MAJOR INSTRUCTIONAL AREAS

1. Java
2. Primitive Variables
3. Operators
4. Programming Control Structures
5. Arrays
6. Object-Oriented Programming
7. Methods
8. Error Handling

COURSE LEARNING OBJECTIVES

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

1. Describe the benefits of using an Integrated Development Environment (IDE).
2. List and describe several key features of Java.
3. Analyze a business problem in order to recognize objects and operations that form the building blocks of the Java program design.
4. Declare variables, arrays, and instantiate objects.
5. Use control structures to repeat and/or selectively execute code statements.
6. Write Java methods that accept arguments and return values.
7. Write object-oriented Java programs that compile and execute successfully.
8. Implement error handling in a Java program.

COURSE OUTLINE

MODULE 1: JAVA BASICS REFRESHER

COURSE LEARNING OBJECTIVES COVERED

- Describe the benefits of using an Integrated Development Environment (IDE).
- List and describe several key features of Java.
- Analyze a business problem in order to recognize objects and operations that form the building blocks of the Java program design.
- Implement error handling in a Java program.

TOPICS COVERED

- Identifying the Key Features of Java
- Comparing the Key Features of Java IDEs
- Structuring Classes and Creating Objects
- Declaring and Importing Packages
- Identifying the Scope of Variables

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Liang, Review Chapter 1 (Sections 1.5, 1.6, 1.8, 1.9, 1.10, and 1.11) and Chapter 14.	No	5.5 hrs
Lesson: Study the lesson for this module.	No	2 hrs
Discussion: Participate in the discussion titled "Advantages of Java."	Yes	N/A
Lab: Complete the lab titled "Creating Java Application."	Yes	N/A
Quiz: Prepare for Quiz 1.	No	2 hrs

Total Out-Of-Class Activities: 9.5 Hours

MODULE 2: USING OPERATORS, ARRAYS, AND CONSTRUCTS

COURSE LEARNING OBJECTIVES COVERED

- Describe the benefits of using an Integrated Development Environment (IDE).
- List and describe several key features of Java.
- Analyze a business problem in order to recognize objects and operations that form the building blocks of the Java program design.
- Declare variables, arrays, and instantiate objects.
- Write Java methods that accept arguments and return values.
- Implement error handling in a Java program.

TOPICS COVERED

- Using Java Operators
- Testing Equality Between Strings and Other Objects
- Using Conditional Constructs
- Using Arrays
- Using Loop Constructs

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Liang, Review Chapters 2, 6, and 7.	No	10 hrs
Lesson: Study the lesson for this module.	No	2.5 hrs
Quiz: Take Quiz 1.	Yes	N/A
Discussion: Participate in the discussion titled "Operators and Variables in Java."	Yes	N/A
Lab 1: Complete the lab titled "Using Java Operators."	Yes	N/A
Lab 2: Complete the lab titled "Using Multidimensional Arrays and Loops."	Yes	N/A
Quiz: Prepare for Quiz 2.	No	2 hrs

Total Out-Of-Class Activities: 14.5 Hours

MODULE 3: WORKING WITH METHODS AND ENCAPSULATION

COURSE LEARNING OBJECTIVES COVERED

- Analyze a business problem in order to recognize objects and operations that form the building blocks of the Java program design.
- Declare variables, arrays, and instantiate objects.
- Use control structures to repeat and/or selectively execute code statements.
- Write Java methods that accept arguments and return values.
- Write object-oriented Java programs that compile and execute successfully.

TOPICS COVERED

- Working with Methods
- Overloading Methods and Constructors
- Applying Encapsulation Principles to a Class
- Applying Access Modifiers
- Passing Values and References

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Liang, Review Chapters 5 and 8.	No	9 hrs
Reading: ITT Tech Virtual Library> *Java in Easy Steps*, 5th ed.> Chapter 6.	No	3 hrs
Lesson: Study the lesson for this module.	No	2.5 hrs
Quiz: Take Quiz 2.	Yes	N/A
Discussion: Participate in the discussion titled "Concept of Encapsulation."	Yes	N/A
Lab 1: Complete the lab titled "Creating a Method."	Yes	N/A
Lab 2: Complete the lab titled "Working with Overloaded Constructors."	Yes	N/A
Quiz: Prepare for Quiz 3.	No	2 hrs

Total Out-Of-Class Activities: 16.5 Hours

MODULE 4: WORKING WITH INHERITANCE AND EXCEPTION HANDLING

COURSE LEARNING OBJECTIVES COVERED

- Analyze a business problem in order to recognize objects and operations that form the building blocks of the Java program design.
- Use control structures to repeat and/or selectively execute code statements.
- Write Java methods that accept arguments and return values.
- Write object-oriented Java programs that compile and execute successfully.
- Implement error handling in a Java program.

TOPICS COVERED

- Understanding the Importance of Inheritance
- Using Polymorphism and Method Overriding
- Using Abstract Classes and Interfaces
- Handling Exceptions

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Liang, Review Chapters 10 and 11.	No	8 hrs
Reading: ITT Tech Virtual Library> *Java: A Beginner's Guide*, 6th ed.> Chapters 4 and 6.	No	3 hrs
Lesson: Study the lesson for this module.	No	2.5 hrs
Quiz: Take Quiz 3.	Yes	N/A
Discussion: Participate in the discussion titled "Using Inheritance."	Yes	N/A
Lab 1: Complete the lab titled "Working with Abstract Class and Function Overriding."	Yes	N/A
Lab 2: Complete the lab titled "Handling the Built-In Exceptions."	Yes	N/A
Quiz: Prepare for Quiz 4.	No	2 hrs
Exam: Prepare for Exam 1.	No	5 hrs

Total Out-Of-Class Activities: 20.5 Hours

MODULE 5: WORKING WITH SELECTED CLASSES FROM JAVA API

COURSE LEARNING OBJECTIVES COVERED

- Describe the benefits of using an Integrated Development Environment (IDE).
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- Analyze a business problem in order to recognize objects and operations that form the building blocks of the Java program design.
- Declare variables, arrays, and instantiate objects.
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TOPICS COVERED

- Using the StringBuilder Class
- Using ArrayList
- Working with Dates and Times
- Using Simple Lambda Expressions

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Liang, Review Chapter 9.	No	5 hrs
Reading: ITT Tech Virtual Library> *Java in Easy Steps*, 5th ed.> Chapter 7.	No	4.5 hrs
Reading: ITT Tech Virtual Library> *Java: A Beginner's Guide*, 6th ed.> Chapter 14.	No	4 hrs
Lesson: Study the lesson for this module.	No	2.5 hrs
Quiz: Take Quiz 4.	Yes	N/A
Discussion: Participate in the discussion titled "Advantages of StringBuilder."	Yes	N/A
Lab: Complete the lab titled "Using Lambda Expression."	Yes	N/A
Exam: Take Exam 1.	Yes	N/A
Exam: Prepare for Exam 2.	No	5 hrs

Total Out-Of-Class Activities: 21 Hours

MODULE 6: REVIEW AND FINAL EXAM

COURSE LEARNING OBJECTIVES COVERED

- Describe the benefits of using an Integrated Development Environment (IDE).

- List and describe several key features of Java.
- Analyze a business problem in order to recognize objects and operations that form the building blocks of the Java program design.
- Declare variables, arrays, and instantiate objects.
- Use control structures to repeat and/or selectively execute code statements.
- Write Java methods that accept arguments and return values.
- Write object-oriented Java programs that compile and execute successfully.
- Implement error handling in a Java program.

TOPICS COVERED

- Best Practices
- Tips and Tricks
- Exam Essentials

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Lesson: Study the lesson for this module.	No	3 hrs
Discussion: Participate in the discussion titled "Self Reflection."	Yes	N/A
Exam: Take Exam 2.	Yes	N/A
Final Exam: Prepare for the final exam.	No	5 hrs
Final Exam: Take the final exam.	Yes	N/A

Total Out-Of-Class Activities: 8 Hours

EVALUATION AND GRADING

EVALUATION CRITERIA

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

CATEGORY	WEIGHT
Discussion	10%
Lab	20%
Quiz	15%
Exam	30%
Final Exam	25%
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.*

OTHER ITEMS

- Virtual machine to support Eclipse
- External USB hard drive to host the virtual machines specifically required for this program.
- Microsoft Office
- Microsoft Visio*

* This software title is available for download from ITT Technical Institute's DreamSpark software download site. For more information, please review the DreamSpark Implementation Guide, available at the ITT Technical Institute Student Portal> Resources> Download Center.

RECOMMENDED RESOURCES

- Books and Professional Journals
  - Reese, R. Lai, D. (2013). *Introduction to java programming student lab manual (1st ed.). Boston, MA: Pearson Custom.*
- ITT Tech Virtual Library (accessed via Student Portal | https://studentportal.itt-tech.edu)
  - Basic Search>
    - McGrath*, M. (2014). Java (5th ed.). Warwickshire, UK: In Easy Steps Ltd.*
    - Schildt, H. (2014). *Java: A beginner's guide (6th ed.). McGraw-Hill.*
    - Sharan, K. (2014). *Beginning Java 8 fundamentals: Language syntax, arrays, data types, objects, and regular expressions. NY: Apress Media.*
- Other References
  - Boyarsky, J. & Selikoff S. (2015). *OCA: Oracle certified associate Java SE 8 programmer I study guide: Exam 1Z0-808. Indianapolis, IN: Wiley.*

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 hands-on labs and lessons. Your progress will be regularly assessed through a variety of assessment tools including discussion, lab, quiz, exam, 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)