

No	Information of IT 31045 & 32045	
1	Unit name:	Programming Language in Java
2	Code:	IT 31045 & 32045
3	Classification:	Engineering Subject
4	Credit value:	3
5	Semester/ Year Offered:	1/2
6	Pre-requisite:	Basic Computer
7	Mode of delivery:	Lecture, Practical
8	Assessment system and breakdown of marks:	Test, Exam, Practical
	Practical:	30%
	Mid-term/ Final Examination	70%
9	Academic staff teaching unit:	Department of Information Technology Engineering
10	<p>Course outcome of unit:</p> <p>After completion of this semester, students will be able to</p> <ol style="list-style-type: none"> 1. How to write a computer programming in algorithms what can be very difficult language to learn. 2. To understand the fundamentals of programming in Java with Algorithms. 3. To learn details of Java programming in format. 4. To know new concepts and their application to real programming problems. 	
12	<p>Topic:</p> <p>Introduction to Computer and Java</p> <p>1.1 Introduction</p> <p>1.2 Computers: Hardware and Software</p> <p>1.3 Data Hierarchy</p> <p>1.4 Computer Organization</p> <p>1.5 Machine Languages, Assembly Languages and High-Level Languages</p> <p>1.6 Introduction to Object Technology</p> <p>1.7 Operating Systems</p> <p>1.8 Programming Languages</p> <p>1.9 Java and a Typical Java Development Environment</p> <p>1.10 Test-Driving a Java Application</p> <p>1.11 Web 2.0: Going Social</p> <p>1.12 Software Technologies</p>	

1.13 Keeping Up-to-Date with Information Technologies

1.14 Wrap-Up

Introduction to Java Application

2.1 Introduction

2.2 Your First Program in Java: Printing a Line of Text

2.3 Modifying Your First Java Program

2.4 Displaying Text with printf

2.5 Another Application: Adding Integers

2.6 Memory Concepts

2.7 Arithmetic

2.8 Decision Making: Equality and Relational Operators

2.9 Wrap-Up

Introduction Classes, Objects, Methods and Strings

3.1 Introduction

3.2 Declaring a Class with a Method and Instantiating an Object of a Class

3.3 Declaring a Method with a Parameter

3.4 Instance Variables, *set* Methods and *get* Methods

3.5 Primitive Types vs. Reference Types

3.6 Initializing Objects with Constructors

3.7 Floating-Point Numbers and Type double

3.8 (Optional) GUI and Graphics Case Study: Using Dialog Boxes

3.9 Wrap-Up

Control Statement Part I

4.1 Introduction

4.2 Algorithms

4.3 Pseudocode

4.4 Control Structures

4.5 if Single-Selection Statement

4.6 if...else Double-Selection Statement

4.7 while Repetition Statement

4.8 Formulating Algorithms: Counter- Controlled Repetition

4.9 Formulating Algorithms: Sentinel- Controlled Repetition

4.10 Formulating Algorithms: Nested Control Statements

4.11 Compound Assignment Operators

4.12 Increment and Decrement Operators

4.13 Primitive Types

4.14 (Optional) GUI and Graphics Case Study: Creating Simple Drawings

4.15 Wrap-Up

Control Statement Part II

5.1 Introduction

5.2 Essentials of Counter-Controlled Repetition

5.3 for Repetition Statement

5.4 Examples Using the for Statement

5.5 do...while Repetition Statement

5.6 switch Multiple-Selection Statement

5.7 break and continue Statements

5.8 Logical Operators

5.9 Structured Programming Summary

5.10 (Optional) GUI and Graphics Case Study: Drawing Rectangles and Ovals

5.11 Wrap-Up

Methods: A Deeper Look

6.1 Introduction

6.2 Program Modules in Java

6.3 static Methods, static Fields and Class Math

6.4 Declaring Methods with Multiple Parameters

6.5 Notes on Declaring and Using Methods

6.6 Method-Call Stack and Activation Records

6.7 Argument Promotion and Casting

6.8 Java API Packages

6.9 Case Study: Random-Number Generation

6.9.1 Generalized Scaling and Shifting of Random Numbers

6.9.2 Random-Number Repeatability for Testing and Debugging

6.10 Case Study: A Game of Chance; Introducing Enumerations

6.11 Scope of Declarations

6.12 Method Overloading

6.13 (Optional) GUI and Graphics Case Study: Colors and Filled Shapes

6.14 Wrap-Up

Arrays and Array Lists

7.1 Introduction

7.2 Arrays

7.3 Declaring and Creating Arrays

7.4 Examples Using Arrays

7.5 Case Study: Card Shuffling and Dealing Simulation

7.6 Enhanced for Statement

7.7 Passing Arrays to Methods

7.8 Case Study: Class GradeBook Using an Array to Store Grades

7.9 Multidimensional Arrays

7.10 Case Study: Class GradeBook Using a Two-Dimensional Array

7.11 Variable-Length Argument Lists

7.12 Using Command-Line Arguments

7.13 Class Arrays

7.14 Introduction to Collections and Class ArrayList

7.15 (Optional) GUI and Graphics Case Study: Drawing Arcs

7.16 Wrap-Up

Classes and Objects : Deeper Look

8.1 Introduction

8.2 Time Class Case Study

8.3 Controlling Access to Members

8.4 Referring to the Current Object's Members with the this Reference

8.5 Time Class Case Study: Overloaded Constructors

8.6 Default and No-Argument Constructors

8.7 Notes on *Set* and *Get* Methods

8.8 Composition

8.9 Enumerations

8.10 Garbage Collection and Method finalize

8.11 static Class Members

8.12 static Import

8.13 final Instance Variables

8.14 Time Class Case Study: Creating Packages

8.15 Package Access

8.16 (Optional) GUI and Graphics Case Study: Using Objects with Graphics

8.17 Wrap-Up

Object Oriented Programming: Inheritance

9.1 Introduction

9.2 Superclasses and Subclasses

9.3 protected Members

9.4 Relationship between Superclasses and Subclasses

9.4.1 Creating and Using a CommissionEmployee Class

9.4.2 Creating and Using a BasePlusCommissionEmployee Class

9.4.3 Creating a CommissionEmployee–BasePlusCommissionEmployee Inheritance Hierarchy

9.4.4 CommissionEmployee–BasePlusCommissionEmployee Inheritance Hierarchy Using protected Instance Variables

9.4.5 CommissionEmployee–BasePlusCommissionEmployee Inheritance Hierarchy Using private Instance Variables

9.5 Constructors in Subclasses

9.6 Software Engineering with Inheritance

9.7 Class Object

9.8 (Optional) GUI and Graphics Case Study: Displaying Text and Images Using Labels

9.9 Wrap-Up

Object Oriented Programming Polymorphism

10.1 Introduction

10.2 Polymorphism Examples

10.3 Demonstrating Polymorphic Behavior

10.4 Abstract Classes and Methods

10.5 Case Study: Payroll System Using Polymorphism

10.5.1 Abstract Superclass Employee

10.5.2 Concrete Subclass SalariedEmployee

10.5.3 Concrete Subclass HourlyEmployee

10.5.4 Concrete Subclass CommissionEmployee

10.5.5 Indirect Concrete Subclass BasePlusCommissionEmployee

10.5.6 Polymorphic Processing, Operator instanceof and Downcasting

10.5.7 Summary of the Allowed Assignments Between Superclass and Subclass Variables

10.6 final Methods and Classes

10.7 Case Study: Creating and Using Interfaces

10.7.1 Developing a Payable Hierarchy

10.7.2 Interface Payable

10.7.3 Class Invoice

10.7.4 Modifying Class Employee to Implement Interface Payable

10.7.5 Modifying Class Salaried Employee for Use in the Payable Hierarchy

10.7.6 Using Interface Payable to Process Invoices and Employees Polymorphically

10.7.7 Common Interfaces of the Java API

10.8 (Optional) GUI and Graphics Case Study: Drawing with Polymorphism

Exception Handling : Deeper Look

11.1 Introduction

11.2 Example: Divide by Zero without Exception Handling

11.3 Example: Handling Arithmetic Exceptions and InputMismatchExceptions

11.4 When to Use Exception Handling

11.5 Java Exception Hierarchy

11.6 finally Block

11.7 Stack Unwinding and Obtaining Information from an Exception Object

11.8 Chained Exceptions

11.9 Declaring New Exception Types

11.10 Preconditions and Postconditions

11.11 Assertions

11.12 (New in Java SE 7) Multi-catch: Handling Multiple Exceptions in One catch

11.13 (New in Java SE 7) try-with-Resources: Automatic Resource Deallocation

11.14 Wrap-Up

GUI Component Part I

14.1 Introduction

14.2 Java's New Nimbus Look-and-Feel

14.3 Simple GUI-Based Input/Output with JOptionPane

14.4 Overview of Swing Components

14.5 Displaying Text and Images in a Window

14.6 Text Fields and an Introduction to Event Handling with Nested Classes

14.7 Common GUI Event Types and Listener Interfaces

14.8 How Event Handling Works

14.9 JButton

14.10 Buttons That Maintain State

14.10.1 JCheckBox

14.10.2 JRadioButton

14.11 JComboBox; Using an Anonymous Inner Class for Event Handling

14.12 JList

14.13 Multiple-Selection Lists

14.14 Mouse Event Handling

14.15 Adapter Classes

14.16 JPanel Subclass for Drawing with the Mouse

14.17 Key Event Handling

14.18 Introduction to Layout Managers

14.18.1 FlowLayout

14.18.2 BorderLayout

14.18.3 GridLayout

14.19 Using Panels to Manage More Complex Layouts

14.20 JTextArea

14.21 Wrap-Up

Generic Colloection

20.1 Introduction

20.2 Collections Overview

20.3 Type-Wrapper Classes for Primitive Types

20.4 Autoboxing and Auto-Unboxing

20.5 Interface Collection and Class Collections

20.6 Lists

20.6.1 ArrayList and Iterator

20.6.2 LinkedList
20.7 Collections Methods
20.7.1 Method sort
20.7.2 Method shuffle
20.7.3 Methods reverse, fill, copy, max and min
20.7.4 Method binarySearch
20.7.5 Methods addAll, frequency and disjoint
20.8 Stack Class of Package java.util
20.9 Class PriorityQueue and Interface Queue
20.10 Sets
20.11 Maps
20.12 Properties Class
20.13 Synchronized Collections
20.14 Unmodifiable Collections
20.15 Abstract Implementations
20.16 Wrap-Up
GUI Component Part II
25.1 Introduction
25.2 JSlider
25.3 Windows: Additional Notes
25.4 Using Menus with Frames
25.5 JPopupMenu
25.6 Pluggable Look-and-Feel
25.7 JDesktopPane and JInternalFrame
25.8 JTabbedPane
25.9 Layout Managers: BorderLayout and GridBagLayout
25.10 Wrap-Up
Assessing Database with JDBC
28.1 Introduction
28.2 Relational Databases
28.3 Relational Database Overview:
The books Database
28.4 SQL
28.4.1 Basic SELECT Query
28.4.2 WHERE Clause
28.4.3 ORDER BY Clause
28.4.4 Merging Data from Multiple
Tables: INNER JOIN
28.4.5 INSERT Statement
28.4.6 UPDATE Statement
28.4.7 DELETE Statement
28.5 Instructions for Installing MySQL and MySQL Connector/J
28.6 Instructions for Setting Up a MySQL User Account
28.7 Creating Database books in MySQL
28.8 Manipulating Databases with JDBC
28.8.1 Connecting to and Querying a Database
28.8.2 Querying the books Database
28.9 RowSet Interface
28.10 Java DB/Apache Derby
28.11 PreparedStatements

	28.12 Stored Procedures 28.13 Transaction Processing 28.14 Wrap-Up 28.15 Web Resources
14	Main references: Java, How to Program,(Ninth Edition), Paul Deitel , Harvey Deitel
15	Additional references: Teach Yourself Java in 21 Days, Laura Lemay, Charles L. Perkins