

SRI VENKATESWARA UNIVERSITY - TIRUPATI

B.S.c., in **COMPUTER SCIENCE (MINOR)**

III SEMESTER

(W.E.F. Academic Year 2024-25)

COURSE STRUCTURE

Semester	Paper	Title of the Course	No. of Hrs./ Week	No. of Credits
III	2	Object Oriented Programming using Java- (T)	3	3
		Object Oriented Programming using Java - (P)	2	1

SRI VENKATESWARA UNIVERSITY::TIRUPATI

COMPUTER SCIENCE (MINOR)

III Semester W.E.F. 2024-25

COURSE 2: OBJECT ORIENTED PROGRAMMING USING JAVA

Theory

Credits: 3

3 hrs/week

Course Objectives:

To introduce the fundamental concepts of Object-Oriented programming and to design & implement object-oriented programming concepts in Java.

Course Out comes :

Upon successful completion of the course, a student will be able to:

1. Understand the basic concepts of Object-Oriented Programming and Java Program Constructs.
2. Implement classes and objects and analyze Inheritance and Dynamic Method Dispatch.
3. Demonstrate various classes in different packages and can design own packages.
4. Manage Exceptions and Apply Threads.
5. Create GUI screens along with event handling.

UNIT-I

OOPs Concepts and Java Programming: Introduction to Object-Oriented concepts, procedural and object-oriented programming paradigm

Java programming: An Overview of Java, Java Environment, Data types, Variables, constants, scope and life time of variables, operators, type conversion and casting, Accepting Input from the Keyboard, Reading Input with Java. util. Scanner Class, Displaying Output with System. out. Print f(), Displaying Formatted Output with String. format(), Control Statements.

UNIT-II

Arrays, Command Line Arguments, Strings-String Class Methods

Classes & Objects: Creating Classes, declaring objects, Methods, parameter passing, static fields and methods, Constructors, and 'this' keyword, overloading methods and access

Inheritance: Inheritance hierarchies, super and subclasses, member access rules, 'super' keyword, preventing inheritance: final classes and methods, the object class and its methods; **Polymorphism:** Dynamic binding, method overriding, abstract classes and methods;

UNIT-III

Interface: Interfaces VS Abstract classes, defining an interface, implement interfaces, accessing implementations through interface references, extending interface;

Packages: Defining, creating and accessing a package, understanding CLASSPATH, importing packages.

Exception Handling: Benefits of exception handling, the classification of exceptions, exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally.

UNIT-IV

Multithreading: Differences between multiple processes and multiple threads, thread states, thread life cycle, creating threads, interrupting threads, thread priorities, synchronizing threads, inter thread communication.

UNIT-V

Stream based I/O (java.io) – The Stream classes-Byte streams and Character streams, Reading console Input and Writing Console Output, File class, Reading and writing Files, The Console class.

TEXT BOOKS:

1. Java The complete reference, 9th edition, Herbert Schildt, McGraw Hill.
2. Understanding Object-Oriented Programming with Java, updated edition, T. Budd, Pearson Education.

REFERENCE BOOKS:

1. Cay S. Horstmann, “Core Java Fundamentals”, Volume 1, 11 th Edition, Prentice Hall, 2018.
2. Paul Deitel, Harvey Deitel, “Java SE 8 for programmers”, 3rd Edition, Pearson, 2015.
3. S. Malhotra, S. Chudhary, Programming in Java, 2nd edition, Oxford Univ. Press.

SUGGESTED CO-CURRICULAR ACTIVITIES & EVALUATION METHODS:

Unit 1: Activity: Quiz on Object-Oriented Programming Concepts and Java Constructs

Evaluation Method: Quiz Performance and Knowledge Retention

Unit 2: Activity: Object-Oriented Programming Assignment: Class Implementation

Evaluation Method: Assignment Completion and Correctness

Unit 3: Activity: Hands-on Lab Activity: Creating and Using Custom Java Packages

Evaluation Method: Lab Performance and Correctness of Code Implementation

Unit 4: Activity: Case Study Discussion on where multi-threading is crucial

Evaluation Method: Critical thinking, problem-solving, and presentation skills.

Unit 5: Activity: creation of files and performing read write operations on files.

Evaluation Method: Case study discussion on where files are crucial

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COMPUTER SCIENCE - MINOR

III Semester – W.E.F. 2024-25

Course 2: Object Oriented Programming using Java

Practicals

Credits: 1

2 hrs/week

List of Experiments

1. A. Write a Java program to print Fibonacci series using for loop.
B. Write a java program to check whether the given number is palindrome or not.
2. Write a Java program to calculate addition & multiplication of 2 matrices.
3. A. Write a java program to print all the values passed from the command line.
B. Write a java program to perform arithmetic operations using Command line.
C. Write a java program to perform factorial using command line.
4. A. Write a Java String program to check whether a string is a Palindrome or not.
B. Write a Java String Program to Insert a string into another string.
C. Write a Java String Program to Replace a Character at a Specific Index.
5. Create a class Rectangle. The class has attributes length and width. It should have methods that calculate the perimeter and area of the rectangle. It should have read Attributes method to read length and width from user.
6. Develop a Java application to generate Electricity bill.
Create a class with the following members: Consumer no., consumer name, previous month reading, current month reading, type of EB connection (i.e. domestic or commercial). Compute the bill amount using the following tariff.
If the type of the EB connection is domestic, calculate the amount to be paid as follows: First 100 units - Rs. 1 per unit; 101-200 units - Rs. 2.50 per unit; 201 -500 units - Rs. 4 per unit; 501 units - Rs. 6 per unit.
If the type of the EB connection is commercial, calculate the amount to be paid as follows: First 100 units - Rs. 2 per unit; 101-200 units - Rs. 4.50 per unit; 201 -500 units - Rs. 6 per unit; 501 units - Rs. 7 per unit.
7. Write a Java program to implement various types of inheritance i. Single
ii. Multi-Level

8. Write a Java program to implement various types of inheritance i. Hierarchical ii. Hybrid.
9. A. Write a Java program that implements method overloading.
B. Write a Java program to implement constructor overloading.
C. Write a JAVA program give example for “super” keyword
10. Write a java program to implement runtime polymorphism.
11. A. Develop a java application to implement currency converter (Dollar to INR, EURO to INR, Yen) using Interfaces.
B. write a java program to implement multiple inheritance using interfaces.
12. A. Write a Java program which accepts withdraw amount from the user and throws an exception “In Sufficient Funds” when withdraw amount more than available amount.
B. To write a JAVA program Illustrating Multiple catch clauses
13. Write a Java program to create three threads and that displays “good morning”, for every one second, “hello” for every 2 seconds and “welcome” for every 3 seconds by using extending Thread class.
14. Write a Java program that creates three threads. First thread displays “OOPS”, the second thread displays “Through” and the third thread Displays “JAVA” by using Runnable interface.
15. A. Write a Java program that displays the number of characters, lines and words in a text file.
B. Write a Java program that reads a file and displays the file on the screen, with a line number before each line?

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MODEL QUESTION PAPER

Time: **3 Hours**

Max. Marks: **75**

PART-A

Answer any **FIVE** of the following. Each Question Carries 5 marks.

(5X5=25)

1. **Short answer question from unit-I**
2. **Short answer question from unit-I**
3. **Short answer question from unit-II**
4. **Short answer question from unit-II**
5. **Short answer question from unit-III**
6. **Short answer question from unit-III**
7. **Short answer question from unit-IV**
8. **Short answer question from unit-IV**
9. **Short answer question from unit-V**
10. **Short answer question from unit-V**

PART-B

Answer any **FIVE** of the following. Each Question Carries 10 marks.

(5X10=50)

11. a) **Essay question from Unit-I**
OR
b) **Essay question from Unit-I**
12. a) **Essay question from Unit-II**
OR
b) **Essay question from Unit-II**
13. a) **Essay question from Unit-III**
OR
b) **Essay question from Unit-III**
14. a) **Essay question from Unit-IV**
OR
b) **Essay question from Unit-IV**
15. a) **Essay question from Unit-V**
OR
b) **Essay question from Unit-V**