Sri Sathya Sai College for Women, Bhopal

(An Autonomous College affiliated to Barkatullah University, Bhopal)

(NAAC Accredited 'A' Grade)

SYLLABUS
SESSION: 2023-24
PROGRAM: Diploma

YEAR: II Year
CLASS: B.Sc.
SUBJECT: Computer Science

(An Autonomous College Affiliated to Barkatullah University Bhopal)
Department of Higher Education, Govt. of M.P.
Under Graduate Syllabus (Annual Pattern)
As recommended by Central Board of Studies and approved by the Governor of M. P.
wef 2022-2023
(Session 2023-24)
(NEP-2020)

Class	B.Sc.
Year	II Year
Subject	Computer Science
Course Title	Object Oriented Programming with Java
Course Type	Core Course (Major II)/Minor/Elective
Credit Value	4
Max. Mark	30+70 (Minimum Marks 35)

Course Outcome: After the completion of this course, a student shall be able to:

- Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity.
- Identify classes, objects, members of a class and the relationships among them needed for finding the solution to a specific problem.
- Demonstrates how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.
- Demonstrate understanding and use of different exception handling mechanisms and concepts of multi-threading for robust faster and efficient application development.
- Identify and describe common abstract user interface components to design GUI in Java using Applet & AWT along with response to events.
- Identify, Design & Develop complex Graphical user interfaces using principal Java Swing classes based on MVC architecture.

Particular

Unit I	**OOPS-** Object Oriented Paradigm, Benefits of OOP, Applications of OOP, **Java-** History, Java Features, How Java differs from C and C++, Java and internet, Java and World Wide Web, Web Browsers, Hardware and Software Requirements, Java Support Systems, Java Environment. Java Program Structure - Java Tokens, Java Statements, Implementing a Java program, Java Virtual Machine, Command Line Arguments and Programming style. **Keywords:** OOPS, JVC, WWW, Java Environment
Unit II	**Java Basics -** Constants, Variables, Data Types, Declaration of Variables, giving values to Variables, Scope of Variable, Symbolic Constants, Type Casting, Getting Values of Variables, Standard Default Values. **Operators -** Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bitwise Operators, Special Operators.

	Arithmetic Expressions- Evaluation of Expressions, Precedence of Arithmetic Operators, Type Conversion in Expressions, Operator Precedence and Associativity, Mathematical Functions. **Decision Making** with if Statement, simple if Statement, if…..Else Statement, Nesting of if…..Else Statement, if-else Ladder, The Switch Statement , The ? Operator. **Loops** - While Statement, Do Statement, For Statement, Jump in Loops, Labeled Loops. **Keywords:** Operators, Arithmetic Expressions, Decision Making, Loops.
Unit III	**Class**- Defining a Class, Adding Variables, Creating Objects, Accessing Class Members. **Constructors**- definition and types, Method Overloading, Static Members, Nesting of Methods. **Inheritance**- Extending a class, Overloading Methods, Final Variables and Methods, Final Classes, Finalize Methods, Abstract Methods and Classes, Visibility Control Arrays, One Dimensional Array, Strings, Vectors, Wrapper Classes. Defining Interfaces, Extending Interfaces, Implementing Interfaces, Accessing Interface Variables. **Keywords:** Class, Constructors, Inheritance, Final , Abstract Methods, Overloading.
Unit IV	**Java API Packages**- Using System Packages, Naming Conventions, Creating Packages, Accessing a Package, Using a Package, Adding a Class to a Package, and Hiding Classes. Creating Threads, Extending the Thread Class, Stopping and Blocking a Thread, Life Cycle of a Thread, Using Thread Methods, Threads Exceptions, Threads Priority, Synchronization, Implementing the 'Runnable' interface. **Types of Errors**- Exceptions, Syntax of Exception Handling Code, Multiple Catch Statements, Using Finally Statements, Throwing our own Exceptions, Using Exceptions for Debugging. **Preparing to Write Applets**- Building Applet Code, Applet Life Cycle, Creating an Executable Applet, Designing a Web Page, Applet Tag, Adding Applet to HTML File, Running the Applet. **Keywords:** API, threads, synchronization, errors, Applets, debugging
Unit V	**More About the Applet tag**- Passing Parameters to Applets, Aligning the Display, More About HTML Tags, Displaying Numbering Values, Getting Input from the user. **The Graphics Class**- Lines and Rectangles, Circles and Ellipses, Drawing Arcs, Drawing Polygons, Line Graphs, Using Control Loops in Applets, Drawing Bar Charts. **Concept of Stream**- Stream Classes, Byte Stream Classes, Character Stream Classes, Using Streams. **Other Useful I/O Classes** - Using the File Class, Input / Output Exceptions, Creation of Files, Reading / Writing Characters, Reading / Writing Bytes, Handing Primitive Data Types, Concatenating and Buffering Files, Random Access Files, Interactive Input and Output, other Stream Classes. **Keywords:** Stream, files, Graphics class, buffering, HTML tags

Suggestion Books:
- E Balaguruswamy, Programming with Java Tata McGraw-Hill, Publication

Reference Books:
- Bruce Eckel, Thinking in Java.
- Herbert Schildt, Java: The Complete Reference.
- Y. Daniel Liang, Introduction to java Programming.
- Paul Deitel, Harvey Deitel, Java: How To Program.
- Java Projects, BPB Publications.

Suggestive digital platform web links
- https://www.cs.cmu.edu/afs/cs.cmu.edu/user/gchen/download/java/LearnJava.pdf
- https://www.tutorialspoint.com/java/java_tutorial.pdf
- https://www.youtube.com/watch?v=7s3xDfdqfDw

Suggested equivalent online courses
- https://nptel.ac.in/courses/106/105/106105191/

Scheme of Marks:

Maximum Marks: 100		
Continuous Comprehensive Evaluation (CCE): 30 marks, Term End Exam Theory: 70 marks		
Internal Assessment: Continuous Comprehensive Evaluation (CCE):	Class Test Assignment/ Presentation	30
External Assessment: University Exam Section Time:03.00 Hours	**Section (A)** Very Short questions **Section (B)** Short questions **Section (C)** Long questions	70
		Total 100

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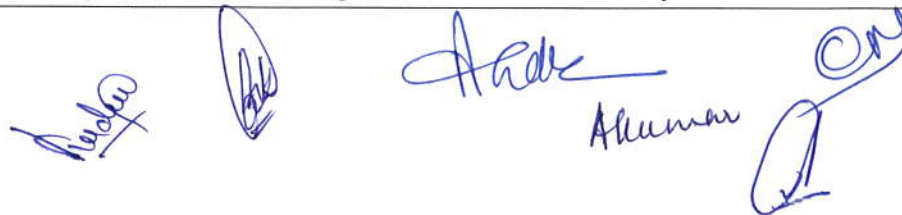*wef 2022-2023*
(Session 2023-24)
(NEP-2020)

Class	B.Sc.
Year	II Year
Subject	Computer Science
Course Title	Java Programming Lab
Course Type	Core Course (Major II)/Minor/Elective
Credit Value	2
Max. Mark	30+70 (Minimum Marks 35)

Course Outcome: After the completion of this course, a student shall be able to do the following:

- Implement Object Oriented programming concept using basic syntaxes of control structures, strings and function for developing skills of logic building activity.
- Identify classes, objects, members of a class and the relationships among them needed for finding the solution to a specific problem.
- Demonstrates how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.
- Demonstrate understanding and use of different exception handling mechanisms and concepts of multi-threading for robust faster and efficient application development.
- Identify and describe common abstract user interface components to design GUI in Java using Applet & AWT along with response to events.
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Particular

List of Practicals:
(Using any Text editor: Notepad/Eclipse/Netbeans/Sublime etc.)

1. Find greater number between two numbers - using conditional operator.
2. Find the factorial of number if number is given by user using command line argument.
3. Write a program to check if a number is prime or not.
4. Write a pogram to display tables from 2 to 10.
5. Write a program to print Fibonacci series.
6. Enter a no. and check whether it is even or odd.
7. Write a Program to find sum & average of 10 no. using arrays.
8. Write a program to display reverse of a digit no. using array.
9. Write a program to demonstrate function overloading.
10. Write a program to display grade according to the marks obtained by the student.

11. Write a program to calculate the salary of an employee if salary is greater than or equal to 20000 and year of service is greater than or equal to 5 years then bonus will be 2000 otherwise 1000 and print gross salary of employee.
12. Write a program to convert the given no. of days into months & days using with classes, objects and method.
13. Write a program to convert given string into Uppercase and lowercase and get the length of string using array.
14. Create a package called "Arithmetic" that contains methods to deal all arithmetic operations. Also write a program to use the package.
15. Write a program to demonstrate use of constructor and destructor.
16. Define an exception called "Marks out of Bound" exception that is thrown if the entered marks are greater than 100.
17. Write a program using application of single inheritance. Find the area of rectangle & volume of cube.
18. Develop a simple real life application to illustrate the use of multithreading.
19. Write a program using multiple inheritance to calculate area and perimeter of a circle using interface.
20. Write an applet program to draw a Rectangle (color = orange) and a right aligned oval.
21. Develop an applet that receives 3 numeric values as inputs from the user and then displays the largest no. on the screen.
22. Write a Java program to read data from the inputted text file name, and print its content on the console.
23. Write a Java program to merge two files into third file.
24. Write a Java program to delete duplicate lines in text file.
25. Write a Java program to implement FileInputStream class to read binary data from any image file.

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- Herbert Schildt, Java: The Complete Reference.
- Y. Daniel Liang, Introduction to java Programming.
- Paul Deitel, Harvey Deitel, Java: How To Program.
- Java Projects, BPB Publications.

Suggestive digital platform web links
- https://www.cs.cmu.edu/afs/cs.cmu.edu/user/gchen/download/java/LearnJava.pdf
- https://www.tutorialspoint.com/java/java_tutorial.pdf
- https://www.youtube.com/watch?v=7s3xDfdqfDw

Suggested equivalent online courses
- https://nptel.ac.in/courses/106/105/106105191/

Scheme of Marks:

Maximum Marks: 100		
Internal Assessment :	Class Interaction / Quiz Attendance Assignments (Charts / Model Seminar / Rural Service / Technology Dissemination / Report of Excursion / Lab Visits / Survey / Industrial visit)	30
External Assessment:	Viva Voce on Practical Practical Record File Table Work / Experiments	70
		Total 100