



VIJAYANAGARA SRI KRISHNADEVARAYA UNIVERSITY
JNANASAGARA CAMPUS, BALLARI-583105

Department of Studies in
Computer Science

III Semester Syllabus

Bachelor of Science

With effect from 2022-23 and onwards

DSC 3: Object Oriented Programming Concepts and Programming in JAVA

Course Title: Object Oriented Programming Concepts and Programming in JAVA	Course code: 21BSC3C3CSL
Total Contact Hours: 52	Course Credits: 04
Internal Assessment Marks: 40	Duration of SEE: 03 Hours
Semester End Examination Marks: 60	

Course Outcomes (CO's):

At the end of the course, students will be able to:

1. Explain the object-oriented concepts and JAVA.
2. Write JAVA programs using OOP concepts like Abstraction, Encapsulation, Inheritance and Polymorphism.
3. Implement Classes and multithreading using JAVA.
4. Demonstrate the basic principles of creating Java applications with GUI.

DSC 3: Object Oriented Programming Concepts and Programming in JAVA

Unit	Description	Hours
1	Introduction to Java: Basics of Java programming, Data types, Variables, Operators, Control structures including selection, Looping, Java methods, Overloading, Math class, Arrays in java.	09
2	Objects and Classes: Basics of objects and classes in java, Constructors, Finalizer, Visibility modifiers, Methods and objects, Inbuilt classes like String, Character, String Buffer, File, this reference.	10
3	Inheritance and Polymorphism: Inheritance in java, Super and sub class, Overriding, Object class, Polymorphism, Dynamic binding, Generic programming, Casting objects, Instance of operator, Abstract class, Interface in java, Package in java, UTIL package.	09
4	Event and GUI programming: Event handling in java, Event types, Mouse and key events, GUI Basics, Panels, Frames, Layout Managers: Flow Layout, Border Layout, Grid Layout, GUI components like Buttons, Check Boxes, Radio Buttons, Labels, Text Fields, Text Areas, Combo Boxes, Lists, Scroll Bars, Sliders, Windows, Menus, Dialog Box, Applet and its life cycle, Introduction to swing, Exceptional handling mechanism.	12
5	I/O programming: Text and Binary I/O, Binary I/O classes, Object I/O, Random Access Files. Multithreading in java: Thread life cycle and methods, Runnable interface, Thread synchronization, Exception handling with try catch-finally, Collections in java, Introduction to JavaBeans and Network Programming	12

References:

1. Programming with Java, By E Balagurusamy – A Primer, 4th Edition, McGraw Hill Publication.
2. Core Java Volume I – Fundamentals, By Cay S. Horstmann, Prentice Hall.

3. Object Oriented Programming with Java: Somashekara M.T., Guru, D.S., Manjunatha K.S, 1st Edition, PHI Learning2017.
4. Java 2 - The Complete Reference, Herbert Schildt, 5th Edition, McGraw Hill Publication, 2017.
5. Java - The Complete Reference, Herbert Schildt, 7th Edition, McGraw Hill Publication, 2017.

Course Title: JAVA Lab	Course code: 21BSC3C3CSP
Total Contact Hours: 52	Course Credits: 02
Internal Assessment Marks: 25	Duration of SEE: 03 Hours
Semester End Examination Marks: 25	

Course Outcomes (CO's):

At the end of the course, students will be able to:

1. Implement Object Oriented programming concept using basic syntaxes of control Structures
2. Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem
3. Demonstrates how to achieve reusability using inheritance
4. Demonstrate understanding and use of interfaces, packages, different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.
5. Identify and describe common user interface components to design GUI in Java using Applet & AWT along with response to events

Practice Lab

1. Program to print the following triangle of numbers

```

1
1 2
1 2 3
1 2 3 4
1 2 3 4 5

```
2. Program to simple java application, to print the message, "Welcome to java".
3. Program to display the month of a year. Months of the year should be held in an array.
4. Program to find the area of rectangle.
5. program to demonstrate a division by zero exception
6. Program to create a user defined exception say Pay out of Bounds.

Programming Lab

PART A: Java Fundamentals OOPs in Java

1. Program to assign two integer values to X and Y. Using the 'if' statement the output of the program should display a message whether X is greater than Y.
2. Program to list the factorial of the numbers 1 to 10. To calculate the factorial value, use while loop. (Hint Fact of 4 =4*3*2*1).
3. Program to add two integers and two float numbers. When no arguments are supplied, give a default value to calculate the sum. Use function overloading.
4. Program to perform mathematical operations. Create a class called AddSub with methods to add and subtract. Create another class called MulDiv that extends from Add, Sub class to use the member data of the super class. MulDiv should have methods to multiply and divide A main function

- should access the methods and perform the mathematical operations.
5. Program with class variable that is available for all instances of a class. Use static variable declaration. Observe the changes that occur in the object's member variable values.
 6. Program
 - a. To find the area and circumference of the circle by accepting the radius from the user.
 - b. To accept a number and find whether the number is Prime or not
 7. Program to create a student class with following attributes. Enrollment No: Name, Mark of sub1, Mark of sub2, mark of sub3, Total Marks. Total of the three marks must be calculated only when the student passes in all three subjects. The pass mark for each subject is 50. If a candidate fails in any one of the subjects his total mark must be declared as zero. Using this condition write a constructor for this class. Write separate functions for accepting and displaying student details. In the main method create an array of three student objects and display the details.
 8. In a college first year class are having the following attributes Name of the class (BCA, BCom, BSc), Name of the staff No of the students in the class, Array of students in the class
 9. Define a class called first year with above attributes and define a suitable constructor. Also write a method called best Student () which process a first-year object and return the student with the highest total mark. In the main method define a first-year object and find the best student of this class
 10. Program to define a class called employee with the name and date of appointment. Create ten employee objects as an array and sort them as per their date of appointment. ie, print them as per their seniority.
 11. Create a package ' student. Fulltime BCA 'in your current working directory
 - a. Create a default class student in the above package with the following attributes: Name, age, sex.
 - b. Have methods for storing as well as displaying.

PART B: Exception Handling & GUI Programming

1. Program to catch Negative Array Size Exception. This exception is caused when the array is initialized to negative values.
2. Program to handle NullPointerException and use the "finally" method to display a message to the user.
3. Program which create and displays a message on the window
4. Program to draw several shapes in the created window
5. Program to create an applet and draw gridlines
6. Program which creates a frame with two buttons father and mother. When we click the father button the name of the father, his age and designation must appear. When we click mother similar details of mother also appear.
7. Create a frame which displays your personal details with respect to a button click.
8. Create a simple applet which reveals the personal information of yours.

9. Program to move different shapes according to the arrow key pressed.
10. Program to create a window when we press M or m the window displays Good Morning, A or the window displays Good After Noon E or e the window displays Good Evening, N or n the window displays Good Night
11. Demonstrate the various mouse handling events using suitable example.
12. Program to create menu bar and pull-down menus.

Note: Student has to execute a minimum of 10 programs in each part to complete the Lab course.