GLS UNIVERSITY
Bachelor of Computer Applications (BCA)
(Core Course)
Semester-III
210301301 CORE JAVA

1. Course Objective:

- Understand the concept of OOP and the purpose and principles of inheritance, polymorphism, encapsulation and method overloading.
- To apply the knowledge of the Java to programs that leverage the object-oriented features of the Java language.
- Understand the principles of abstract classes and interfaces.

2. Course Duration:

The course will have sessions which are divided into five modules. Each module consists of nine sessions of 60 minutes each and carries a weightage of 20%.

3. Course Contents:

Module No.	Modules/Sub-Modules	No. of Sessions	Marks Weightage
I	**Introduction to Java** **OOP Concepts** • Introduction • Principles of Object Oriented Languages • Java Features • Java Program Structure • Java Architecture • Introduction to java framework • Real time java applications **Basics of Java** • Primitive data-types • Variables, Identifiers, Literals • Operators and Expressions • Primitive Type Conversion & Casting • Conditional statements and loops • Using Scanner class for terminal input	09	20%
II	**Java Programming Constructs** **Classes Vectors and Array** • Classes • Objects • Class Declaration in Java • Creating Objects • Methods • Constructors ○ Parameterized Constructor	09	20%

	○ Constructor Overloading • Garbage Collection • Class Variables & Methods ○ Static Variables ○ Static Methods • Introduction to vector • this Keyword • Command-line Arguments **Arrays** • Using For-Each with Arrays • Passing and returning arrays to/from Methods • Variable Arguments		
III	**Inheritance, Interfaces and Packages** **Inheritance** • Introduction • Types of Inheritance • extend, super,final Keyword • Overriding of Methods • Abstract Class **Interfaces** • Introduction • Variables in interface • Extending Interfaces • Interface Vs. Abstract Classes **Packages** • Introduction • Creating Packages • Using Packages • Access Protection • java.lang Packages ○ java.lang.Object Class ○ Java Wrapper Classes ○ String Class ○ String Buffer Class	09	20%
IV	**Exception Handling and Multi-Threading** **Exception Handling** • Introduction • Exception Types • Handling Techniques ○ try...catch ○ throw Keyword ○ throws Keyword ○ finally Block ○ multi-catch ○ User-defined Exception **Multi-Threading** • Introduction • Thread Life Cycle • java.lang.Thread	09	20%

	• Main Thread
	• Creation of New Thread
	  ○ By Inheriting the Thread Class
	  ○ By Implementing the Runnable Interface
	  ○ Thread Priorities		

V	**Applets**
	Applet
	• Applet Class
	• Applet Life Cycle
	• Applet Structure
	• Common Methods used with Applet
	  ○ drawString()
	  ○ setBackground()
	  ○ setForeground()
	  ○ showStatus()
	• Applet using Graphics Class
	  ○ drawLine()
	  ○ setColor() & setFont()
	  ○ drawOval() & fillOval
	  ○ drawRect() & fillRect()
	• Basic Controls in Japplet
	  ○ JLable
	  ○ JButton
	  ○ JTextArea
	  ○ JTextField
	  ○ JRadioButton
	  ○ JCheckBox
	  ○ JComboBox
		09	20%

4. Teaching Methods:

The following pedagogical tools will be used to teach this course:

1. Lectures and Discussions
2. Assignments and Presentation
3. Videos and e-learning

5. Evaluation:

The students will be evaluated on a continuous basis and broadly follow the scheme given below.

1.	Assignments / Quizzes, etc.	30% (Internal Assessment)
2.	Internal Examination	20% (Internal Assessment)
3.	External Examination	50% (External Assessment)

6. Basic Text Books:

Sr. No	Author/s	Name of the book	Publisher	Edition
T1	Sachin Malhotra, Saurabh Chaudhary	Programming in Java	OXFORD	Latest

7. Reference Books:

Sr. No	Author/s	Name of the book	Publisher	Edition
R1	Joyce Farrell Ankit Bhavsar	JAVA for Beginners	Cengage Learning	Latest
R2	Dr. G.T.Thampi	Object Oriented Programming in java	Dreamtech	Latest
R3	K somasundaram	Programming in Java2	Jaico	Latest

8. List of Journals / Periodicals / Magazines / Newspapers etc.:

Sr. No	Link
1	www.cs.columbia.edu/~lok/3101/lectures/02-corejava.pdf
2	portal.aauj.edu/e-book/teach_your_self_java_in_21_days.pdf
3	http://www.nptelvideos.com/video.php?id=1472&c=15
4	http://nptel.ac.in/courses/106105084/28
5	http://nptel.ac.in/courses/106105084/29
6	http://nptel.ac.in/courses/106105084/30

9. Session Plan:

Session No.	Topics / Chapters
1	Introduction to OOP
2	Principles of Object Oriented Languages
3	Java Essentials & Java Features & Java Program Structure
4	Java Architecture & Java Vs C++
5	Variables & Primitive data-types
6	Identifiers, Literals, Operators, Expressions
7	Using Scanner class for terminal input and Primitive Type Conversion & Casting
8	Flow of Control
9	Flow of Control
10-12	Classes, Objects, Class Declaration in Java, Creating Objects, Methods
13	Constructors
14	Garbage Collection
15-16	Class Variables & Methods, this Keyword, Command-line Arguments
17-18	Array
19-21	Inheritance
22-24	Interfaces
25	Introduction to Packages, Creating, Using, Accessing Packages
26-27	java.lang Packages
28	Introduction to Exception Handling
29-30	Exception types
31	Handling Techniques
32-33	Introduction to Multi-threading, Thread Life-cycle
34-36	java.lang.Thread, Main Thread, Creation of New Thread
37	Applet Class, Applet Life Cycle, Applet Structure
38	Common Methods used with Applet
39-41	Applet using Graphics Class

42-43	Basic Control in JApplet
44-45	Basic Control in JApplet

10. Learning Outcome:

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

- Create Java application programs using sound OOP practices (e.g., interfaces and APIs) and proper program structuring (e.g., by using access control identifies, automatic documentation through comments, error exception handling).
- Identify classes, objects, members of a class and the relationship among them.