D. Syllabus Detailing and Learning objectives

Module	Chapter	Detailed Content	Syllabus Detailing	Learning Objectives
Module1	Fundamental of Java Programming (12)	Theory 1.1 Overview of procedure and object oriented Programming, Java Designing Goals, Features of Java Language. 1.2 Introduction to the principles of object-oriented programming: Classes, Objects, Abstraction, Encapsulation, Inheritance, Polymorphism, 1.3 Keywords, Data types, Variables, Operators, Expressions, Types of variables and methods. 1.4 Control Statements: If Statement, If-else, Nested if, switch Statement, break, continue. Iteration Statements: for loop, while loop, and do-while loop.	**Purpose**: To know language fundamentals to implement Objects **Scope –** **1. Academic Aspects-** Understanding various Data types, operators, statements(control,decision) etc. **2. Technology Aspect- Programing u**sing Java **3. Application Aspect-** to find suitable data types, control structures w.r.t problem statement. Students Evaluation – Theory Questions to be asked on 1. Define Java. 2. List various Data types with their memory requirements 3.Describe working of control statements 4. list all features of JAVA	1. To **describe** various Data Types and Statements in java.(**U)** 2. To **find** states and behavours for given object**.**(**AN**) 3. To **find** keywords,operators,varoiables,methods etc. from java source code**.(AN)**
Module 2	Classes, Objects, Arrays and Recursion	2.1 Classes & Objects: Class Fundamentals: Assigning Object Reference Variables, Passing parameters to Methods and Returning parameters from the methods, Nested and Inner	**Purpose-** To understand Class and Object, Methods or behaviors, static memory allocation technique Scope – 1. **Academic Aspects**- to write and call methods or behaviors	1.**Define** class in java.**(R)** **2**. **Explain** types of constructors (**R)** 3. **Interpret** various problems using class, object and constructors**(A)**

	(12)	Classes. 2.2 Constructors: Parameterized Constructors, finalize( ) Method, Method overloading, Constructors overloading, Recursion, Command-Line Arguments. 2.3 Wrapper classes, Java.util.Scanner, Java. io.BufferedReader, Java.io.DataInputStream, Java.io.DataOutputStream and String Buffer classes and String functions. 2.4 Arrays & Vectors: One Dimensional arrays, Two Dimensional array, Irregular arrays, dynamic arrays, Array List and Array of Object.	2. **Technology Aspect**- Using Java Programming Language 3. **Application Aspect**- Developing any ADT **Students Evaluation –** 1. Define Object 2. List types of methods in java 3. Discuss various Input Methods (to read input from user) in java 4.Implement ADT'S like Stack, Queue, etc.	
Module 3	Inheritance, Interface and	3.1 Inheritance Basics, , Types of Inheritance in Java, Concept of Super and sub class, inheriting	**Purpose –** To understand feature inheritance for 2 reasons 1) Code reusability 2) properties sharing	1.**List** types of Inheritance does java support.(**R)** **2**. **Explain** how to create and add class in packages (R)

	Packages(8)	Data members and Methods, Role of Constructors in inheritance, Making methods and classes final , Method overriding, Dynamic Method Dispatch, Abstract classes and methods 3.2 Defining an interface, extending interfaces , implementing interfaces, accessing implementations through interface references, Interfaces vs. Abstract classes. 3.3 Packages – Steps for defining, creating and accessing a Package, importing packages,Making JAR Files for Library Packages, java.util.Vector	**Scope** – **1. Academic Aspects-** understanding feature Inheritance and its use to solve complex objet implementation 2**. Technology Aspect**- Using Java Programming Language **3. Application Aspect-** Developing TCET Object. **Students Evaluation –** 1. Why inheritance is good OOP feature? 2. List types of inheritance does java suppport 3. Discuss why java doesn't allow multiple inheritances? 4.Implement program to manage data of Thakur Engg college.	3. **Interpret** Problems on Inheritance and Packages**(A)**
Module 4	Exception Handling and Multithreading	.1 Exception handling Mechanism: try, catch, throw, throws and finally. 4.2 Multithreading: Need of Multithreading , Java thread Model, thread Life-Cycle, thread class Methods, Implementing Runnable, Extending thread, Synchronizing threads, synchronized Statement, Critical	**Purpose-** to understand excellent OOP feature feature Robustness of a java language and how to do multitasking using java **Scope –** 1**. Academic Aspects**- understanding Exception handling and Multithreading concepts 2**. Technology Aspect**- Using Java Programming Language 3. **Application Aspect**- To implement applications like Bank software for creating various exceptions w.r.t need of bank protocols	1. D**efine** malloc and calloc **(R)** **2. Define** types of linked list **(U)** **3. Explain Compaction (U)** 4**. Compare** Static and Dynamic memory allocation**(E)** **5. interpret** linked list to represent polynomials**(A)**

		Factor in Thread –Deadlock.	**Student Evaluation -** 1. What is an Exception 2. What is Thread in java 3. Discuss ways to create Thread in java. 4. Explain Applications Multithreading	
Module 5	Applet Programming, GUI development using AWT and Event handling(10)	5.1 Applet: Applet fundamentals, Applet lifecycle, Creating applet, paint method Applet tag, Applet class methods. 5.2 Designing Graphical User Interfaces in Java, Components and Containers, Basics of Components, Using Containers, Layout Managers, AWT Components, Adding a Menu to Window, Extending GUI Features 5.3 Event-Driven Programming in Java, Event- Handling Process, Event- Handling Mechanism, Delegation Model of Event Handling, Event Classes, Event Sources, Event Listeners, Adapter Classes as Helper Classes in Event Handling	**Purpose –** To understand and design GUI using java and handling events with AWT package **Scope –** **1. Academic Aspects-** To learn components of AWT and different types of events **2. Technology Aspect-** Using Java Programming Language **3. Application Aspect-** To design GUI applications like, registration form, authentication system etc **Student Evaluation –** 1. What do you mean by event in java? 2. Explain types of event in java 3. Explain various components of AWT	**Learning Objective:** 1. **Lis**t various AWT components **(R)** 2. **Define** is event in java? **(U)** 3. **List** types of event in java**(R)** 4. **Describe** is use of applet designing **(U)**
Module 6	Java Swings(6)	6.1 Introducing Swing: AWT vs Swings, Components and Containers, Swing Packages, A Simple Swing Application,	**Purpose:** To understand and design GUI using java and handling events with swing package	**Learning Objective:** 1. **Lis**t various swing components **(R)**

		Painting in Swing, Designing Swing GUI Application using Buttons,JLabels, Checkboxes, Radio Buttons, JScrollPane, JList, JComboBox, Trees, Tables Scroll pane Menus and Toolbars	**Scope –** **1. Academic Aspects-** To learn components of swing and different types of events. **2. Technology Aspects:** Using Java Programming Language **3 Applications:** To design GUI applications like, registration form, authentication system etc **Student Evaluation** **State** difference between AWT and Swing List components of Swing	2. **Define** is event in java? **(U)** 3. **List** types of event in java**(R)** 4. **Describe** is use of Japplet designing **(U)** **5. Differentiate** between AWT and Swing **(A)**