Gyanmanjari
Innovative University

Subject: Advanced Java-MSCIT12508

Type of course: Major Core

Prerequisite: Basic knowledge of java programming

Rationale:

The Advanced Java Programming syllabus is designed to provide students with an in-depth understanding of Java's advanced concepts and their practical applications. This course bridges the gap between basic programming knowledge and real-world software development, equipping learners with the skills necessary to develop robust, secure, and scalable applications.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
CI	T	P	C	Theory Marks		Practical Marks		CA	
				ESE	MSE	P	V	ALA	
3	0	4	5	60	30	10	20	30	150

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; SEE - Semester End Evaluation; MSE- Mid Semester Examination; LWA - Lab Work Assessment; V – Viva voce; CCE-Continuous and Comprehensive Evaluation; ALA- Active Learning Activities.

CourseContent:

Sr. No	Course content	Hrs	% Weightage
1	**Multithreading and File handling:** **Multithreading** Introduction, definition and benefits of multithreading, Thread creation, thread lifecycle, thread priorities and Scheduling. **File handling** Introduction to File Handling, File class, Input /Output Streams, File input/output operations, Reading and writing textfiles.	08	10%

2	**Network Programming with Java:** Network Programming With java.net Package- Inet Address class, URL class, URL Connection class. Establishing two-way communication between Server and Client-TCP/IP client sockets, TCP/IP server sockets.	06	20%
3	**Java Data Base Connectivity (JDBC):** Describe the basics of JDBC and its connectivity. The JDBC API. The Statement Interface, Prepared Statement, Callable Statement, the ResultSet Interface, Transaction processing– commit, rollback, savepoint Explain different types of JDBC drivers and their advantages and disadvantages. database operations like creating tables, operations using SQL CRUD operation.	10	25%
4	**Servlets:** Introduction to Servlets, Life Cycle of Servlet. Creating, configuring and deploying echo servlet on Tomcat Server. Parameters and Attributes – HttpServletRequest Interface, ServletContext and ServletConfig Interface, Request Delegation –RequestDispatcher Interface. Exploring Session Tracking Mechanisms. Connecting and reading database/table records and displaying them using servlet, Advantages and Disadvantages of Servlet.	10	25%
5	**Java Server Pages(JSP):** JSP Scripting Elements JSP Expressions. Difference between JSP and JSP Declarations, Simple JSP program to fetch database records.	06	10%
6	**Hibernate:** Overview of Hibernate, Hibernate Architecture, Hibernate Mapping Types, Hibernate O/R Mapping, Hibernate Annotation Hibernate Query Language	05	10%

Continuous Assessment:

(For each activity maximum-minimum range is 5 to 10 marks)

Sr. No	Active Learning Activities	Marks
1	**Discovering Tech Stack:** Discovering the current framework in Java involves exploring the techlandscape, with popular choices. List websites that utilize Java frameworks forweb development and upload on GMIU web portal.	10
2	**Synchronization:** Students have to build a programming for the demonstration of the synchronization of threads in to multithreading environment.	10
3	**API Integration Scavenger Hunt:** Students have to build a simple application that uses a third-party API (e.g., Weather API, Currency Conversion API). Student have to integrate it and	10

they have to submit it on GMIU Web Portal.(Group of four)	
Total	30

Suggested Specification table with Marks (Theory):75

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	35%	40%	10%	10%	0	5%

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcome:

After learning the course the students should be able to:	
CO1	Enhance java programming skill by implementing multithreading and File Handling.
CO2	Develop networked applications in java using network protocols, socket programming, and related technologies.
CO3	Implement basic database operations using JDBC.
CO4	Apply server-side programs using Servlets and JavaServerPages application using JSPtags.
CO5	Create database-driven Java applications using Hibernate framework and Implement simple webservice using Java technologies.

List of Practical

Sr. No	Descriptions	Unit No	Hrs
1	Write a program in java that create thread that print numbers from 1 to 10 number.	1	2
2	Write a program in java that creates two threads :One thread prints the odd numbers and another thread will print even numbers from 1 to 100.	1	2
3	Write a program in java that demonstrates thread priority and scheduling.	1	2
4	Write a java program to demonstrate thread and write operations in text file.	1	2
5	Write a client server program where client sends two numbers and server responds with square of them.	2	2
6	Develop chat application using socket programming.	2	2
7	Develop an application that demonstrates how to connect a Java application with a database using JDBC.	3	2
8	Develop a database application that uses any JDBC driver.	3	4
9	Develop an application that demonstrates inserting records into a database table using JDBC.	3	2
10	Develop an application that demonstrates updating existing records in a database table using JDBC.	3	2
11	Develop an application that demonstrates accessing and processing data returned from the database using ResultSet.	3	2
12	Develop an application to present a set of choice for user to select a product and display the price of product.	3	4
13	Write an HTML code to create login form having one submit button, two textboxes labeled as Login name and Password as respectively. Write a Servlet class named as ReadParameter to read these two parameters and display entered parameters values on the page using doGet() or doPost() method when user clicked on submit button.	4	4
14	Create a web form which processes servlet and demonstrates use of cookies and sessions.	4	4
15	Write a Application to demonstrates JSP life cycle translation, compilation, initialization, service, and destruction phases.	5	4
16	Develop a JSP login practical that verifies username and password entered by the user and displays a login success or failure message.	5	4
17	Develop a simple JSP program for user registration and then control will be transfer it into second page.	5	4
18	Develop a student login application using MVC architecture (JSP& servlet). display whether student gets Successfully logged in or not.	5	4
19	Develop a Application that demonstrates Create, Read, Update, and Delete operations using Hibernate.	6	4

20	Develop a simple hibernate Web Application that displays all records stored in a student table having attributes student_id, student_name and student branch.	6	4
		Total	60

Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory

The internal evaluation will be done on the basis of Active Learning Assignment

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

Reference Books:

[1] THE COMPLETE REFERENCE JSP 2.0, PHIL HANNA, BPB

[2] J2EE: The complete Reference, James Edward Keogh, McGraw Hill Education

[3] JAVA SERVER PROGRAMMIGJavaEE-7 J2EE 1.7), Black Book, DREAMTECH PRESS

[4] Complete Reference Java 2, Herbert Schildt, McGraw Hill Education

[5] Web Technology with Advanced Java, Soumadip Ghosh, University Press