Maharashtra Institute of Technology
Chhatrapati Sambhajinagar
(An Autonomous Institute)

G. S. Mandal's

Maharashtra Institute of Technology

Chhatrapati Sambhajinagar

An Autonomous Institute Affiliated to

Dr. Babasaheb Ambedkar Marathwada University,

Chhatrapati Sambhajinagar, Maharashtra (India)

Second Year B. Tech Exit Course Syllabus

(Department of Computer Science and Engineering)

(Offered by Department of Computer Science and Engineering)

(NEP 2020 Based Curriculum)

WEF AY 2025-26

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Students may opt for Exit after successful completion of Second Year provided s/he earns 8 additional credits through coursework (VSEC) and/or Internship/OJT during the summer vacation. S/he will be awarded a 2-Year UG Diploma in Artificial Intelligence and Data Science / Artificial Intelligence (AI) and Data Science. Details are available at the Department.

Second Year B. Tech (Department of Computer Science and Engineering)

Exit Course Syllabus Structure

WEF 2025-26 (NEP 2020 Based Curriculum)

Sr. No.	Course Code	Course Name	Credits
1	EX-CSE101	Advanced JAVA	03
2	EX-CSE102	Advanced JAVA Laboratory	01
3	EX-CSE 103	Internship/ Mini Project	04

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(Faculty of Science & Technology)
Department of Computer Science and Engineering
Syllabus of S. Y. B. Tech. Department of Computer Science and Engineering
(Exit Course)

Course Code: EX-CSE101 Course: Advanced JAVA **Teaching Scheme:** Theory: 03 Hrs/week	Credits: 03

Objectives	• To impart advanced programming skills using Java. • To build real-time software components using Java technologies. • To enable development of database-driven and web-based applications.
Course Outcomes	CO1: Develop Java applications using multithreading and exception handling. CO2: Create interactive GUI applications using JavaFX and Swing. CO3: Perform file I/O operations and handle database connectivity using JDBC. CO4: Build dynamic and responsive web applications using Servlets and JSP.
Unit-I	**Object-Oriented Concepts and Exception Handling** Inheritance, Polymorphism, Interfaces, Abstract classes, Exception types, try-catch-finally, throw/throws, Custom exceptions. (06 Hrs.)
Unit-II	**Multithreading and File Handling** Creating and managing threads using Thread and Runnable, Thread lifecycle, synchronization, inter-thread communication, File I/O using File, FileReader, BufferedReader, FileOutputStream. (07 Hrs.)
Unit-III	**GUI Programming using Swing and JavaFX** AWT vs. Swing, Event handling, Swing Components: JFrame, JPanel, JButton, JTable, Introduction to JavaFX: Layouts, Controls, Events, Designing desktop applications with GUI. (07 Hrs.)
Unit-IV	**JDBC and Database Connectivity** JDBC Architecture, Drivers, Steps for JDBC connectivity,CRUD operations using JDBC, Connection pooling and transaction management, Connecting Java applications with MySQL/Oracle DB. (07 Hrs.)

<table>
<tr><td>Unit-V</td><td colspan="5">Web Application Development with Servlets and JSP

Servlet Lifecycle, Request and Response handling, Session management, Cookies, JSP Directives, Scriptlets, Expression Language (EL), Building and deploying simple web apps on Apache Tomcat, Building and deploying simple web apps on Apache Tomcat. (07 Hrs.)
.</td></tr>
<tr><td>Unit -VI</td><td colspan="5">Collections, MVC Architecture
Java Collections Framework: List, Set, Map, Iterator, MVC design pattern overview and implementation in Java, Design a database-driven web application using Java technologies (JDBC + JSP/Servlets + MVC). (06 Hrs.)</td></tr>
<tr><td rowspan="3">Textbooks / Reference Books</td><td>Sr. No.</td><td>Title</td><td>Author</td><td>Publication</td><td>Edition</td></tr>
<tr><td>1.</td><td>Java: The Complete Reference</td><td>Herbert Schildt</td><td>McGraw-Hill</td><td>Eleventh</td></tr>
<tr><td>2.</td><td>Head First Java</td><td>Kathy Sierra & Bert Bates</td><td>O'Reilly Media</td><td>Second</td></tr>
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(Faculty of Science & Technology) Department of Computer Science and Engineering Syllabus of S. Y. B. Tech. Department of Computer Science and Engineering (Exit Course)	
Course Code: EX-CSE102 Course: Advanced Java Laboratory **Teaching Scheme:** Practical: 02 Hrs/week	Credits: 01
Objectives	• Provide a comprehensive understanding of advanced Java programming features. • Equip students with the skills to develop multi-threaded, GUI-based, and web-based applications. • Enable students to integrate Java with databases using JDBC and implement design patterns like MVC. • Prepare students for internships or job roles involving backend development, desktop application design, and full-stack Java development.
Course Outcomes	**CO1**: Apply multithreading, exception handling, and Java collections to develop efficient and scalable Java applications. **CO2**: Design and implement GUI and web-based applications using Swing, JavaFX, Servlets, JSP, and JDBC.
List of Experiments	1. Write a Java program to demonstrate multiple catch blocks and custom exception handling. 2. Develop a multithreaded Java application using Thread and Runnable, showcasing synchronization. 3. Create a program to read data from one file and write it to another using Buffered Reader and Buffered Writer. 4. Implement a student record system using Java Collections (ArrayList, HashMap) and perform sorting and iteration. 5. Design a calculator or login form using Java Swing components like JFrame, JTextField, JButton, and JLabel. 6. Build a JavaFX application for a to-do list or quiz app with proper event handling. 7. Connect a Java application to a MySQL/Oracle database using JDBC and perform CRUD operations. 8. Create a Servlet that accepts HTML form data, processes it, and displays the output using doPost() or doGet(). 9. Design a JSP page that displays student information dynamically using session and EL (Expression Language). 10. Develop a mini project (e.g., Student Management System) using JDBC, JSP/Servlets, and MVC architecture.

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Course Code: EX-CSE103 Course: Internship/ Mini Project **Teaching Scheme:** Theory: 03 Hrs/week	Credits: 04
	The Internship/Mini Project serves as an exit course under the NEP framework, offering students practical exposure to industry or project-based learning. It enables students to apply theoretical knowledge in real-world scenarios, develop technical and professional skills, and prepare a comprehensive report.