Course Code: CSE3151	**Course Title:** Java Full Stack Development	**L-T-P-C**	2	0	2	3
Version No.	1.0					
Course Pre-requisites	**Nil**					
Anti-requisites	**CSE3152 .NET Full Stack Development**					
Course Description	This advanced level course enables students to perform full stack development using Java, with emphasis on employability skills. The key technologies used for Full Stack development is based on either Java technology or .NET technology. In this course, the focus is on using Java, and the related technologies/tools like Java EE, Java Persistence, Hibernate, Maven, Spring Core, etc. On successful completion of this course, the student shall be able to pursue a career in full-stack development. The students shall develop strong problem-solving skills as part of this course.					
Course Objectives	This course is designed to improve the learners' EMPLOYABILITY SKILLS by using PROBLEM SOLVING Methodologies.					
Course Outcomes	**On successful completion of the course the students shall be able to:** **1] Practice the use of Java for full stack development [Apply]** **2] Implement web applications using Java EE. [Apply]** **3] Solve simple applications using Java Persistence and Hibernate [Apply]** **4] Apply concepts of Spring to develop a Full Stack application. [Apply]** **5] Demonstrate automation tools like Maven, Selenium for Full Stack development. [Apply]**					
Course Content:						
Module 1	Introduction	Project	Programming			**12 Sessions**
Topics: Review of Java; Advanced concepts of Java; Java generics; Java IO; New Features of Java. Unit Testing tools.						
Module 2	Java EE Web Applications	Project	Programming			**12 Sessions**
Topics: Introduction to Eclipse & Tomcat; JSP Fundamentals; Reading HTML form Data with JSP; State Management with JSP; JSP Standard Tag Library - Core & Function Tags; Servlet API Fundamentals; ServletContext, Session, Cookies; Request Redirection Techniques; Building MVC App with Servlets & JSP; Complete App - Integrating JDBC with MVC App **Assignment:** Develop an application for managing HR policies of a department.						

Module 3	Java Persistence using JPA and Hibernate	Project	Programming	**12 Sessions**

Topics:
Fundamentals of Java Persistence with Hibernate; JPA for Object/Relational Mapping, Querying, Caching, Performance and Concurrency; First & Second Level Caching, Batch Fetching, Optimistic Locking & Versioning; Entity Relationships, Inheritance Mapping & Polymorphic Queries; Querying database using JPQL and Criteria API (JPA)
Assignment: Design and develop a website that can actively keep track of entry-exit information of a housing society.

Module 4	Spring Core	Project	Programming	**12 Sessions**

Topics:

Spring Core, Spring MVC, Spring Boot REST API; Understanding Spring Framework; Using Spring MVC; Building a Database Web App with Spring and Hibernate Spring AOP (Aspect Oriented Programming); Implementing Spring Security; Developing Spring REST API; Using Spring Boot for Rapid Development

Assignment: Develop a software tool to do inventory management in a warehouse.

Module 5	Automation tools	Project	Programming	**09 Sessions**

Topics:

Introduction to Automation Tools; Apache Maven: Maven Fundamentals, Software Setup – Command line and Eclipse, pom.xml and Directory Structure, Multi-Module Project Creation, Scopes, Dependency Management, Profiles; Functional/BDD Testing using Selenium, Selenium Fundamentals and IDE, Selenium WebDriver, Installation and Configuration, Locating WebElements, Driver Commands, WebElement Commands

Assignment: Illustrate the use of automation tools in the development of a small software project.

Targeted Application & Tools that can be used:

Application Area is to Design and Analyzing the efficiency of Algorithms. This fundamental course is used by all application developers.

Professionally Used Software: Eclipse, NetBeans, Hibernate, Selenium, Maven, GIT.

Project work/Assignment:

1. **Problem Solving: Design of Algorithms and implementation of programs.**
2. **Programming: Implementation of given scenario using Java.**

Text Book:

T1 : Mayur Ramgir, "Full Stack Java Development with Spring MVC, Hibernate, jQuery , and Bootstrap", 1st Edition, Wiley Publication, 2020.

References

R1: Chris Northwood, "The Full Stack Developer: Your Essential Guide to the Everyday Skills Expected of a Modern Full Stack Developer", 1st edition, APress,2018.

R2: Herbert Schildt, "Java The complete reference" , 11th Edition, ORACLE, 2020	
Catalogue prepared by	Mr. Sunil Sahoo,Dr. M Chandrashekhar, Dr.MuraliParameswaran
Recommended by the Board of Studies on	BOS NO: 17 th. BOS held on 22/12/22
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