CSE11123	**Full Stack Development**	**L**	**T**	**P**	**C**
Version 1.0		**3**	**0**	**0**	**3**
Pre-requisite/ Exposure	**Programming Concepts**				
Co-requisite	**Logical Ability**				

Course Objectives:

1. Equip students with a strong foundation in web development basics, including HTML, CSS, and responsive design.
2. Develop skills in advanced JavaScript, front-end frameworks, and user interface design to enhance the user experience.
3. Provide knowledge on server-side programming, database management, and back-end technologies to support web application functionalities.
4. Combine front-end and back-end skills to build integrated, functional web applications that are ready for deployment.
5. Prepare students for the challenges of deploying web applications, ensuring web security, and optimizing performance

Course Outcomes:

On the completion of this course the student will be able to

CO1: Web Fundamentals Mastery: Students will be able to construct well-structured websites using HTML and CSS, and make them responsive across different devices.

CO2: Client-side Development: Learners will acquire the ability to implement advanced JavaScript concepts, manipulate the DOM, and utilize front-end frameworks to create interactive user interfaces.

CO3: Server-side Implementation: Participants will gain proficiency in setting up servers, managing databases, and executing server-side programming with Node.js and Express.js.

CO4: Full-Stack Application Development: Students will demonstrate the capability to integrate front-end and back-end technologies to develop and deploy full-fledged web applications.

CO5: Deployment and Optimization: Graduates will be equipped with the skills to deploy applications to cloud platforms, apply web security best practices, and optimize the performance of web applications.

Course Description:

This course is designed to provide a thorough understanding of web development, covering a wide range of topics from the basics of HTML and CSS to advanced full-stack development. Students will start with foundational concepts of web structure and styling, advance through client-side and server-side development, and finally integrate their knowledge in a capstone project that demonstrates their full-stack development skills. By exploring responsive web design, JavaScript, front-end frameworks, and back-end technologies like Node.js and MongoDB, learners will gain the competencies needed to build and deploy dynamic web applications. Security, performance optimization, and deployment strategies are also covered to prepare students for real-world web development challenges.

Course Content:

Unit-I	**Lecture Hours**
Introduction to Web Development Objective: Lay the foundation for understanding the basics of web development. 1. Introduction to HTML and CSS • HTML basics: Structure, tags, attributes • CSS basics: Selectors, properties, positioning • Introduction to Bootstrap (CSS Framework) 2. Responsive Web Design • Media queries • Flexbox and Grid layout 3. Introduction to JavaScript • Variables, data types, and operators • Control flow and loops	**9**
Unit-II	**9**
Unit 2: Front-end Development Objective: Focus on client-side development and user interface design. 1. Advanced JavaScript	

• Functions, objects, arrays • DOM manipulation and events 2. Front-end Frameworks and Templating Engine • Introduction to a front-end framework and Templating Engine (React and HBS) • Components, props, and state management 3. Web APIs • Consuming RESTful APIs • Asynchronous JavaScript (Promises, Async/Await)	

Unit-III	**9**
Unit 3: Back-end Development Objective: Explore server-side programming and database management. 1. Introduction to Node.js • Setting up a basic Node.js server • npm and package management 2. Express.js • Routing, middleware, and templating engines 3. Database Fundamentals • Introduction to Unstructured Database • mongosh, mogodb compass and mongodb atlas • CRUD operations Using Mongo DB	
Unit-IV	**9**
Unit 4: Full-stack Development Objective: Integrate front-end and back-end skills to build full-fledged applications. Integrating Front-end with Back-end • Connecting front-end to the back-end • Handling data flow	
Unit-V	**9**

Unit 4: Deployment and Advanced Topics Objective: Prepare students for deploying applications and introduce advanced topics. 1. Deployment • Deploying applications to platforms like Heroku, AWS or Oracle Cloud 2. Security and Performance Optimization • Web security best practices • Optimizing front-end and back-end for performance 3. Capstone Project • Final project integrating all learned concepts, review and collab.	