

**NIRMA UNIVERSITY**

<b>Institute:</b>	Institute of Technology
<b>Name of Programme:</b>	BTech CSE, Integrated BTech (CSE)-MBA, BTech CSE (Artificial Intelligence & Machine Learning)
<b>Course Code:</b>	XXXX
<b>Course Title:</b>	Full Stack Development
<b>Course Type:</b>	Core / Department Elective-I
<b>Year of Introduction:</b>	2025-26

L	T	Practical Component				C
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**Course Learning Outcomes (CLO):**

At the end of the course, students will be able to –

1. demonstrate the creation of REST APIs for various backend database functionalities of an application (BL2)
2. compare the approaches used for web application development and identify the various components of it (BL4)
3. develop user-friendly and responsive user interfaces (BL6)
4. design end-to-end web applications with various tools and frameworks. (BL6)

Unit	Contents	Teaching Hours (Total 45)
Unit-I	<b>Full Stack Development Basics:</b> JSON and its usage in web applications, REST APIs, 3-Tier Applications, Various Stacks usage for web application development	07
Unit-II	<b>Frontend Frameworks:</b> Responsive Web Design, Media Queries, HTML5 Features, Bootstrap, Tailwind and CSS based web development, Vue JS: Directives and Binding, React JS: Elements, UI Components, JSX, Redux, Fetch Data and Asynchronous Programming, GraphQL APIs	12
Unit-III	<b>Backend Frameworks:</b> Java Spring MVC, Spring Boot Framework and its Features, Node JS: Express Framework, Routing and Package Manager, Application Development with Built-in Modules and Plugins Integrations	11
Unit-IV	<b>Databases Integrations:</b> RDBMS - MySQL, NoSQL – MongoDB, CRUD Operations, and Integration with Front End Tools	07
Unit-V	<b>Managing and Deploying Applications:</b> Version Control and Project Management with Git, Authentication & Authorisation, Securing, Deploying and Testing the Application	08

**Self-Study:**

The self-study contents will be declared at the commencement of the semester. Around 10% of the questions will be asked from self-study content.

**Suggested Readings/ References:**

1. Chris Northwood, The Full Stack Developer: Your essential guide to the everyday skills, Apress
2. Frank Zammetti, Modern Full-Stack Development: Using Type Script, React, Node.js, Apress



3. David Flanagan, JavaScript: The Definitive Guide, O'Reilly
4. Juha Hinkula, Hands-On Full Stack Development with Spring Boot 2 and React, Packt.
5. Shagun Bakliwal, Hands-on Application Development using Spring Boot, BPB
6. Hassan Djirdeh, Nate Murray, and Ari Lerner, Fullstack Vue: The Complete Guide to Vue.js, Createspace
7. Hugo Di Francesco, Professional JavaScript, Packt
8. Shama Hoque, Full-Stack React Projects, Packt

**Laboratory Work:**

Laboratory work will be based on the above syllabus with a minimum of 10 experiments to be incorporated. The students in a suitable group size will design and perform one experiment as a part of Laboratory work.

S. No	List of Experiments/Exercises	Hours
1	Implement JavaScript application to create and store JSON Object in File	02
2	Implement Java Script Web Application with REST APIs	02
3	Testing of the API implementation and Documentation	02
4	Design Single Page application with React JS	02
5	Develop GraphQL API based Web application	02
6	Develop Web Application using CRUD operations REST APIs on Database with MERN Stack	06
7	Develop Web Application with Java Spring Boot Framework	06
8	Test-Driven Web Application Development	02
9	Apply Identity and Access Management to the Web Application with Deployment	04
10	Manage the Application Versions with Git and Github	02