

| Code:<br>BCA- 3006T<br>(for theory)<br>BCA-3006P<br>(for practical)  | DSEC-III  | Group-C: Elective-I<br>Web Programming-I<br>Full-Stack Fundamentals<br>(Front-End + Basic Back-end) | 1L+T:4P | 3 Credits (15 hours theory and 60 hours practical) |
|--|---|---|---------|--|
| Max Marks; Theory: 100 (Int: 25; Ext: 75); Practical: 100  |   |   |         |  |
| Course Outcomes: Upon completion of the course, students will be able to   |   |   |         |  |
| CO1: Create well-structured and visually appealing web pages using HTML and CSS  |   |   |         |  |
| CO2: Gain hands-on experience in writing JavaScript code to create interactive web pages.  |   |   |         |  |
| CO3: Understand AJAX for real-time data fetching and be able to integrate third-party APIs into web applications   |   |   |         |  |
| CO4: To building scalable front-end applications using React.js.   |   |   |         |  |
| Unit   | Topics for theory and Practical   |   |         | Proposed Lecture                                   |
| I  | <b>Introduction to Web &amp; Full-Stack Development</b><br>Web Development Overview, Types of Developers: Front-End, Back-End, Full-Stack, Client-Server Architecture, HTTP/HTTPS Protocols, Modern Full-Stack Stacks: MERN, MEVN, LAMP.<br><b>HTML5 – Structure of Web Pages</b><br>HTML Elements, Tags, Attributes, Semantic Tags (header, footer, section), Lists, Tables, Forms, Media Tags: <img>, <video>, <audio>, Form Validation (basic), Accessibility Basics (alt text, labels).<br><b>CSS3 – Styling Web Pages</b><br>Selectors, Properties, and Values, Box Model, Display: block, inline, inline-block, flex, grid, Positioning: static, relative, absolute, fixed, CSS Units (px, %, em, rem), Pseudo-classes and pseudo-elements, Transitions & Animations, CSS Frameworks:<br><b>Bootstrap:</b> Grid System, Components(Button, Form, Grid, Link, Nav Bar etc.), Utilities<br><b>Tailwind CSS (basics)</b> |   |         | 5  |
| II   | <b>JavaScript – Programming for the Web</b><br>Variables: var, let, const, Data Types & Operators, Control Structures: if-else, switch, Loops: for, while, do-while, Functions & Arrow Functions, Arrays and Array Methods (map, filter, reduce), Objects and JSON, DOM Manipulation: querySelector, addEventListener, Events: onClick, onSubmit, onLoad, Basic Form Validation, Introduction to ES6 Features<br><b>Introduction to React.js (Front-End Library)</b><br>What is React? Why React?, JSX Syntax, Components: Functional vs Class (focus on functional), Props and State, Handling Events, Lists and Keys, Conditional Rendering, React Developer Tools (extension)  |   |         | 4  |
| III  | <b>Version Control with Git &amp; GitHub</b><br>Git Installation & Configuration, Git Commands: init, add, commit, status, log, Branching and Merging, Using GitHub for Repositories, Collaboration Workflow: fork, pull request, dd GitHub Pages (deployment)  |   |         | 2  |
| IV   | <b>Introduction to Back-End with Node.js &amp; Express.js</b><br>What is Node.js?, npm and Package Management, Setting Up a Server with Express, Handling Routes: GET, POST, Middleware (basic usage), Serving Static Files<br><b>Database Basics with MongoDB</b><br>Introduction to NoSQL, MongoDB vs SQL, Documents, Collections, Databases, CRUD Operations using: MongoDB Compass (GUI), Mongo Shell (CLI), Connecting MongoDB with Node.js, Mongoose Introduction and Schema Design<br><b>Mini Project :</b> Build a small full-stack application.  |   |         | 4  |
| Suggested Readings:  |   |   |         |  |
| 1. Bayross, Ivan, and Sharanam Shah. <i>Web Designing and Development: HTML, CSS, JavaScript, jQuery, AJAX, PHP, and MySQL</i> . BPB Publications, 2010. |   |   |         |  |

2. Crockford, Douglas. *JavaScript: The Good Parts*. O'Reilly Media, 2008.
3. Bibeault, Bear, and Yehuda Katz. *jQuery in Action*. Manning Publications, 2008.
4. Banks, Alex, and Eve Porcello. *Learning React: Functional Web Development with React and Redux*. O'Reilly Media, 2020.