**Course outline (Syllabus of the course) - Template - 1**

| **Course Code: CS3330**  **Name of the Programme: B.Tech**  **Name of the Course: Introduction to Full Stack Development**  **Semester: 5** | | |
| --- | --- | --- |
| **Course credit** | **No. of hours per week**  **(L + T + P)** | **Total no. of Teaching hours** |
| 4 | 3:0:2 | 45L + 30P |
| **Course Objectives**: | | |
| 1. To introduce the fundamentals of front-end and back-end web development. | | |
| 1. To build strong foundations in frontend, backend, and database integration. | | |
| 1. To provide practical skills using Bootstrap, Node.js, Express, and SQLite. | | |
| 1. To introduce ORM for structured and scalable database interaction. | | |

**Syllabus:**

| **Module - 1** | **No. of hours** |
| --- | --- |
| **15** |
| **Introduction to Web and Bootstrap Fundamentals: -**  **Evolution of modern web development**, **What is Bootstrap? Why use Bootstrap in real-world development, Advantages of Bootstrap**, **Drawbacks of Bootstrap**, **Getting started with Bootstrap**, **Grid system**, **Utility classes for spacing, alignment, text formatting, and colors, Typography and layout with Bootstrap components, Navigation bars and list groups using Bootstrap classes, Hands-on:** Build a responsive landing page with header, content, and footer using Bootstrap | |

| **Module - 2** | **No. of hours** |
| --- | --- |
| **15** |
| **Advanced Bootstrap Components and Interactive UI: -**  **Bootstrap components**, **Creating responsive forms with Bootstrap**, **Client-side validation using Bootstrap styles and HTML5 attributes, Advanced layout**, **Responsive utilities**, **Integrating Bootstrap Icons and customizing with CSS overrides, Limitations and best practices when using Bootstrap in projects, Performance considerations**, **Hands-on:** Design a responsive portfolio or product showcase site using Bootstrap components and forms | |

| **Module - 3** | **No. of hours** |
| --- | --- |
| **15** |
| **Introduction to Back-End Concepts: -**  **Introduction to server-side development:** Node.js and its architecture, **Using npm and understanding package.json, Setting up an Express.js server, Routes and RESTful design principles (GET, POST, PUT, DELETE), Middleware functions , Serving static files and building simple APIs, Introduction to templating with EJS or handlebars, Hands-on:** Create a RESTful API to manage a list (e.g., to-do or product list) | |

| **Module - 4** | **No. of hours** |
| --- | --- |
| **15** |
| **Introduction to Relational Databases and SQL.**  **SQLite Fundamentals**, **Connecting Node.js to SQLite using sqlite3 module, ORM Introduction**, MVC Introduction, **Express + ORM Integration**, **Hands-on:** Build a notes app with ORM-based data storage and Express API. | |

| **Module - 5** | **No. of hours** |
| --- | --- |
| **15** |
| **Mini Project & Deployment: -**  **Project Planning**, **Full Stack Integration, API Integration: Using fetch() or AJAX to connect frontend to backend, Testing APIs with Postman, Dev Tools, Hands-on: Build a real-world project (e.g., blog, task tracker) and deploy it.** | |

| **Course outcomes** |
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| a) Create responsive web interfaces using HTML, CSS, JavaScript, and Bootstrap. |
| b) Develop scalable backend applications using Node.js and Express.js. |
| c) Implement relational data management using SQLite and ORM within an MVC-based application structure. |
| d) Build and deploy full stack web applications with proper documentation. |

| **Text Books** | |
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| 1 | "Modern HTML & CSS From The Beginning" by Brad Traversy – Traversy Media |
| 2 | "Web Development with Node and Express" by Ethan Brown – O'Reilly Media |
| 3 | "The Complete Node.js Developer Course" by Andrew Mead – Packt Publishing |

| **Reference books** | |
| --- | --- |
| 1 | Mark Myers – A Smarter Way to Learn JavaScript |
| 2 | Eric Elliott – Programming JavaScript Applications |
| 3 | Kyle Simpson – You Don’t Know JS |
| 5 | Node.js Docs – https://nodejs.org/en/docs/ |
| 6 | Express.js Guide – https://expressjs.com/ |
| 7 | Sequelize Docs – https://sequelize.org/docs/v7/ |

| **Lab Programs /Tutorials** | |
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| 1 | Build a static website with HTML and CSS |
| 2 | Create a form with validation using JavaScript |
| 3 | Build a basic Node.js Express server |
| 4 | Implement CRUD operations with SQLite |
| 5 | Develop a basic full-stack blog or to-do app |
| 6 | Deploy the project online and present it |