

MERN Stack Roadmap
CS 335 Web Development Course

1. Introduction to web development
 - a. Understanding the internet and web
 - i. History of the Web
 - ii. How Browsers work
 - iii. Web protocols (HTTP/HTTPS)
 - b. Client-server Architecture
 - i. Basics of Client side vs Server side
 - ii. APIs and Web Services
 - c. Basics of HTML, CSS, and Javascript
2. HTML: HyperText Markup Language
 - a. Basic HTML Structure (Tags, Elements, Attributes, Head, Body and Metadata)
 - b. Forms, Tables, and Lists (Input Types, validation, styling, ordered, unordered lists)
 - c. Semantic HTML (accessibility, semantic tags)
3. CSS
 - a. Syntax and Selectors (Class, ID, Attribute)
 - b. Box Model and Layout (Margins, Padding, Borders, and Content)
 - c. Flexbox and Grid Systems
 - d. Responsive Design
 - e. CSS Framework (Bootstrap)
4. JavaScript
 - a. Basic Syntax and Data Types
 - b. Control structures (loops, conditionals)
 - c. Functions and Arrow Functions
 - d. Callbacks
 - e. DOM Manipulation and Event Handling
 - f. ES6 + Features (Promises, Async/Await, etc.)
5. React.js
 - a. React Basics (JSX, Components, Props, State)
 - b. Component Lifecycle Methods, Functional vs Class Components
 - c. React Hooks (useState, useEffect, etc.)
 - d. Context API for Prop Drilling
 - e. Routing with react router.
 - f. Navigation and parameter passing
 - g. Protected Routes and Authentication
6. Node.js
 - a. Node.js basics and Setup
 - b. Working with File System
 - c. Building a web server with HTTP Module
 - d. NPM and Node Modules (Managing Dependencies)
 - e. Express.js introduction (basic setup and middleware)

7. Express.js
 - a. Middleware and Routing
 - b. Handling Requests and Responses
 - c. Building RESTful APIs
 - d. Authentication and Authorization
 - e. Connecting to Database
 - f. Web security Essentials (CORS)
 - g. Json Web Tokens (JWT)
8. MongoDB
 - a. NoSQL vs SQL Databases (Comparing with RDBMS, when to choose Mongo)
 - b. MongoDB Basics and CRUD Operations
 - i. Setup and installation
 - ii. Shell basics
 - iii. Creating, reading, updating, and deleting documents
 - c. Embedding vs Referencing Documents
 - d. Mongoose for MongoDB Object Modeling
 - e. Integrating MongoDB with Node/Express