MERN Stack Developer

Fundamentals and Project based learning:
Project 1: Social Media – Built during the live course sessions.
Project 2: Ecommerce – Built by students after the course, guided by instructor.

Course Contents:
1. **Introduction**.
    a. What is MERN Stack?
    b. MERN Overview.
2. **MERN Theoretically**.
    a. Understanding the Full Stack.
    b. Understanding Frontend.
    c. Understanding Backend.
    d. Introduction to REST API.
    e. How Node and React Work Together.
    f. Development Tools and Platforms.
        i. Visual Studio Code.
        ii. Node.js
        iii. Node Package Manager (npm).
    g. Structuring a MERN App.
3. **Target Application (Project 1) and Its Planning**.
    a. Discussing Course Project.
    b. Understanding the Project idea.
    c. Designing the Frontend.
    d. Planning API Endpoints.
    e. Structuring All Pages of Frontend.
4. **Web Development Fundamentals**
    a. HTML Basics.
    b. CSS Basics.
    c. Bootstrap.
    d. JavaScript and ES6.
        i. var / let / const
        ii. Template literals
        iii. Arrays and Objects
        iv. Object literal
        v. Object and Array Destructuring
        vi. Spread and Rest Operator
        vii. Arrow function syntax.
        viii. Default Parameters
        ix. Loops (for, for-in, for-of)
        x. Array functions
            1. push / concat
            2. forEach
            3. filter

          4. map

          5. sort

          6. reduce

      xi. import and export

      xii. async – await

      xiii. classes

5. **React**
   a. What is React?
   b. Introduction
   c. React Folder Structure
   d. Components
   e. Functional vs Class components.
   f. JSX
   g. Props and State
   h. Event Handling
   i. Binding Event Handlers
   j. Conditional Rendering
   k. List rendering
   l. Keys in list
   m. Styling
   n. Form handling
   o. Component Lifecycle Methods
   p. Fragment
   q. Pure Component and Memo
   r. Refs
   s. Portals
   t. Error Boundary
   u. Higher Order Components
   v. Render Props
   w. Context
   x. HTTP in React
   y. React Hooks

6. **Frontend of Project 1**.
   a. Create React App.
   b. Setting up Pages and Routes.
   c. Components.
   d. Types of Components.
   e. Developing Project Components.
   f. Styling Project Components.
   g. Designing Navigation Bar.
   h. Desktop and Mobile Navigation bar implementation.
   i. Portals.
   j. Animating Mobile Navigation Side Drawer.
   k. Dynamic Route Segments.
   l. Rendering Component Elements.

   m. Route Params.

   n. Rendering a Map using Google Maps API.

   o. Custom Form Input Component.

   p. Managing State of Custom Form Input Component.

   q. Adding Input Validation.

   r. Sharing Input Values with Parent Component.

   s. Form State.

   t. Custom Hook.

   u. Sign up Page and Form.

   v. Auth Context for Authentication State Management.

   w. Listening to Context Changes.

   x. Authenticated and Unauthenticated Routes.

7. **Node and Express**.
   a. What is Node.js.
   b. Writing First Node.js Code.
   c. Sending a Request and Response.
   d. What is Express.js.
   e. Adding Express.js to Node.js.
   f. Advantages of Express.js.
   g. How Node and Express Works.

8. **Backend of Project**.
   a. Structuring Node.js Project.
   b. Routes Implementation.
   c. Adding Routes Based on Endpoints.
   d. Handling Errors.
   e. Controllers.
   f. Setting up Routes and Request/Response in Controllers.
   g. Using Postman to Run and Test API Endpoints.
   h. Validating API Request Body.

9. **Database of Project**.
   a. MongoDB and Mongoose Introduction.
   b. SQL vs NoSQL.
   c. Setting up MongoDB.
   d. Connecting Sample Backend to MongoDB.
   e. Creating Document with MongoDB.
   f. Fetching Data from the Database.
   g. Using Mongoose.
   h. Models and Schemas.
   i. Understanding ObjectID.

10. **Building the Full Stack**.
    a. Connecting Backend to Database.
       i. Creating Models and Schemas.
       ii. Creating Documents.
       iii. Updating Documents.
       iv. Deleting Documents.

       v.   Relation between Models.

      vi.   Finalizing Database Connection and Error Handling.

  b. Connecting Frontend to Backend.

       i.   Setup of API Url.

      ii.   Custom Hook for API Calls.

     iii.   Sending POST and GET Requests.

     iv.   Sending Auth Request.

      v.   Finalizing API Calls and Error Handling.

11. **Additional Features**.

  a. Uploading Files.

       i.   Image Upload Component.

      ii.   Handling Files on Backend.

     iii.   Serving Static Images.

     iv.   Deleting Files.

  b. Adding Authentication and Authorization.

       i.   How Auth Works in MERN.

      ii.   Hashing Passwords.

     iii.   Custom Authentication Hook.

     iv.   Logging in Users.

      v.   Generating JSON Web Tokens (JWT) on Backend.

     vi.   Backend Route Protection with Auth Middleware.

    vii.   Adding Authorization.

   viii.   Auto Login and Logout.

12. **Deployment**.

  a. Overview of Deployment Process.

  b. Using Environment Variables in Node.js.

  c. Using Environment Variables in React.js.

  d. API Key and Credentials.

  e. Building React App.

  f. Deploying Standalone REST API.

  g. Deploying Standalone React App.

  h. Deploying Combined MERN app on same host.

  i. Storing Uploaded Files on Server.

13. **Closure**.

  a. Course Rewind.

  b. Future Prospects.

  c. Starting of Project 2 ?