

Information Booklet cum Syllabus

Of

Full Stack Development using MERN

Revision-II



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National Institute of Electronics and Information Technology

An Autonomous Scientific Society under
Ministry of Electronics and Information Technology, Government of India

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1. About Course

In this course, students will learn about the most advanced web-app development environments with immense exposure on practicality. The course is designed for an aspiring developer to enrich the knowledge of different JavaScript libraries and frameworks. Today and ever since the JavaScript has been developed as a language, it has deeply affected the web app development process. In this curriculum, we have covered Express JS, React JS and Node.js, which are all very advanced JavaScript libraries used extensively across the world to handle both the Front-end and Back-end development processes. MongoDB is also covered which is a revolutionary NoSQL kind of database package.

2. NIELIT

National Institute of Electronics and Information Technology, NIELIT, (Erstwhile DOEACC Society) is an autonomous scientific society of the Ministry of Electronics & Information Technology, Government of India. The Society is registered under the Societies Registration Act, 1860. NIELIT was set up to carry out Human Resource Development and related activities in the area of Information, Electronics & Communications Technology (IECT). NIELIT is engaged both in Formal & Non-Formal Education in the areas of IECT besides development of industry-oriented quality education and training programs in the state-of-the-art areas. NIELIT has endeavored to establish standards to be the country's premier institution for Examination and Certification in the field of IECT. It is also one of the National Examination Body, which accredits institutes/organizations for conducting courses in IT and Electronics in the non-formal sector.

3. Objective of Course

This objective of this course is to introduce the learner to the fundamentals of Web Designing, HTML, CSS and advanced components like Nodejs, Expressjs, Reactjs etc.

After completing this course, the learner will be able to:

- Understand the MERN Stack
- Build RESTful APIs
- Master Front-End Development with React
- Integrate Front-End and Back-End
- Database Management with MongoDB
- Authentication and Security
- Deployment
- Testing and Debugging
- Real-World Project Development

4. Job Roles of Course

After successful completion of the course, the candidates shall be employed in the industries for following occupations:

- Web designer
- Front End Web developer
- Backend Web developer
- Full Stack developer

5. Eligibility

10+2/ Graduate (Passed/Appearing) with basic knowledge of Computer Programming or NIELIT O/A Level Courses

6. Total duration of the Course

60 Hours(Theory: 20hours, Practical/Tutorial: 40hours)

7. Course Details

• **Course Outline and Objective of Each Unit**

S. No.	Unit Name	Duration (Theory) in Hours	Duration (Practical) in Hours	Total Learning Hours	Learning Objectives
1.	HTML	02	03	05	After completing this unit, Learner will be able to <ul style="list-style-type: none"> • Understand HTML coding • Create simple webpages • Understand UI. • Develop front end in HTML
2.	CSS	02	04	06	After completing this unit, Learner will be able to <ul style="list-style-type: none"> • Understand CSS • Use CSS for styling • Create thematic UI • Change/Update UI by minimal efforts
3.	JavaScript	08	10	18	After completing this unit, Learner will be able to <ul style="list-style-type: none"> • Understand JavaScript • Create events • Implement dynamics in webpages • Use JavaScript for making website interactive
4.	Node.js	03	06	09	After completing this unit, Learner will be able to <ul style="list-style-type: none"> • Use Node Libraries • Work with data handling functions using different node packages
5.	Express.js	05	07	12	After completing this unit, Learner will be able to <ul style="list-style-type: none"> • Understand Backend • Create APIs • Create Sessions and Cookies • Handle query parameters

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6.	MongoDB	05	07	12	<p>After completing this unit, Learner will be able to</p> <ul style="list-style-type: none"> • Understand Databases • Create Mongo DB database • Implement CRUD operations
7.	ReactJS	08	12	20	<p>After completing this unit, Learner will be able to</p> <ul style="list-style-type: none"> • Understand reusable UI • Create reusable components • Pass data between components • Handle states • Implement conditional rendering • Create a great UI/UX environment.
8.	Project	03	05	08	<ul style="list-style-type: none"> • Project of MERN Technology
Grand Total		36	54	90	

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• Detailed Syllabus

Unit Name	Contents	Hrs.
HTML	<ul style="list-style-type: none"> • HTML Tags • Typography • Images • Lists • Tables • Links • Forms • Frames 	05
CSS	<ul style="list-style-type: none"> • CSS usage • Selectors • Colors • Margin • Padding • Borders • Special Effects like: Shadow, Opacity etc 	06
JavaScript	<ul style="list-style-type: none"> • Scripting • ESS Grammar and types, • Control flow and error handling • Loops, Function, Objects, • Arrays, Promises • ES6 Let and const, • Template literals, Arrow Function • Default parameter, • Async Await 	18
Nodejs	<ul style="list-style-type: none"> • Node.js overview • Node.js - basics and setup • Node.js console • Node.js command utilities • Node.js modules • Node.js concepts • Node.js events • Node.js database access • Node.js with Express.js • Express.js Request 	09
Express.js	<ul style="list-style-type: none"> • Express.js Response, • Express.js Get • Express.js Post • Express.js Routing • Express.js Cookies • Express.js File Upload • Express.js Middleware • Express.js Scaffolding • Express.js Template 	12
MongoDB	<ul style="list-style-type: none"> • Introduction to MongoDB • Installation and Setup 	12

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	<ul style="list-style-type: none"> • Basics • CRUD Operations • Indexes in MongoDB 	
ReactJS	<ul style="list-style-type: none"> • ReactJS introduction and overview • ReactJS installation and environment setup • Introducing JSX, Rendering Elements • Conditional Rendering • Components and Props • State and Lifecycle • Handling Events • Lists and Keys • Forms 	20
Project and Interview Questions	<ul style="list-style-type: none"> • Idea of a Project and planning • Environment setup for a project • Database Development • Coding • Unit Testing • Implementation 	08
Total		90

8. Reference Books/Study Material

- [Beginning Node.js, Express & MongoDB Development](#) - Greg Lim

9. Practical Assignments

<u>Assignment 1.</u>	HTML Writing concise HTML codes for user interfaces.
<u>Assignment 2.</u>	CSS Applying CSS to the HTML codes for great UI designs.
<u>Assignment 3.</u>	JavaScript Writing JS Codes for Events and other dynamic features in UI.
<u>Assignment 4.</u>	ES5 Writing JS codes in ES5 standard.
<u>Assignment 5.</u>	ES6 Writing JS codes in ES6 standard.
<u>Assignment 6.</u>	Node.js Installing and running Node runtime environment and learning node packages.
<u>Assignment 7.</u>	Express.js Writing middlewares, routers, APIs, cookies, sessions etc in Express.
<u>Assignment 8.</u>	React.js Writing Component based UI design.
<u>Assignment 9.</u>	JSX Writing React code in JSX.
<u>Assignment 10.</u>	Project Building a MERN Stack project from scratch.