

# Training Syllabus (MERN)

Lecture wise

## Foundation of 'C'

L.N.	Contents	Hours
1	<ol style="list-style-type: none"><li>1) Introduction of programming</li><li>2) Translator</li><li>3) Introduction of 'C'</li><li>4) History of 'C'</li><li>5) C tokens<ol style="list-style-type: none"><li>a. Keywords</li><li>b. Identifiers</li><li>c. Variables/Constant</li><li>d. Data types</li><li>e. Operators</li><li>f. Function</li><li>g. Header Files</li></ol></li></ol>	2
2	<ol style="list-style-type: none"><li>1) Decision making statements<ol style="list-style-type: none"><li>a. If<ol style="list-style-type: none"><li>i. Simple if</li><li>ii. Else if</li><li>iii. Nested if</li><li>iv. Else if ladder</li></ol></li><li>b. Switch case</li><li>c. Goto</li></ol></li><li>2) Looping statements / Iterative statements<ol style="list-style-type: none"><li>a. While loop</li><li>b. For loop</li><li>c. Do while loop</li></ol></li></ol>	2
3	<ol style="list-style-type: none"><li>1) Array<ol style="list-style-type: none"><li>a. Single Dimensional Arrays</li><li>b. Double Dimensional Arrays</li></ol></li><li>2) String<ol style="list-style-type: none"><li>a. String Handling</li><li>b. String Function</li></ol></li></ol>	2

4	<ol style="list-style-type: none"> <li>1) Function <ol style="list-style-type: none"> <li>a. Built in/Library Functions</li> <li>b. User Define Functions <ol style="list-style-type: none"> <li>i. Declaring a function</li> <li>ii. Defining a function <ol style="list-style-type: none"> <li>1. No Return, No Parameter</li> <li>2. Return, No Parameter</li> <li>3. No Return, Parameter</li> <li>4. Return, Parameter</li> </ol> </li> <li>iii. Calling a function</li> </ol> </li> </ol> </li> </ol>	2
5	<ol style="list-style-type: none"> <li>1) Recursion</li> <li>2) Type Casting</li> <li>3) Scope of variable <ol style="list-style-type: none"> <li>a. Local variable</li> <li>b. Global variable</li> </ol> </li> <li>4) Storage Classes <ol style="list-style-type: none"> <li>a. Automatic</li> <li>b. Register</li> <li>c. Static</li> <li>d. External</li> </ol> </li> </ol>	2
6	<ol style="list-style-type: none"> <li>1) Preprocessors <ol style="list-style-type: none"> <li>a. File inclusion (#include)</li> <li>b. Macro Expansion (#define)</li> </ol> </li> <li>2) Header files <ol style="list-style-type: none"> <li>a. Built in/Library header Files</li> <li>b. User Define header file <ol style="list-style-type: none"> <li>i. Creating user define header file</li> <li>ii. Using user define header file</li> </ol> </li> </ol> </li> </ol>	2
7	<ol style="list-style-type: none"> <li>1) Problem Solving &amp; Recovery Session</li> <li>2) Test</li> </ol>	2

## HTML & CSS

L.N.	Content	Hours
8	<ol style="list-style-type: none"> <li>1) Introduction of Web pages</li> <li>2) Introduction of Websites</li> <li>3) Introduction of Web Browsers</li> <li>4) Introduction of HTML <ol style="list-style-type: none"> <li>a. What is Hypertext?</li> <li>b. What is Markup language</li> </ol> </li> </ol>	2

	<p>5) History of HTML  6) How to use HTML to create web pages?  7) What is tag?  8) What is element?  9) HTML tag  10) Head tag  a. Title tag  b. Style tag  c. Script tag  d. Noscript tag  e. Link tag  f. Meta tag  g. Base tag  11) Body tag  12) Attributes</p>	
9	<p>1) Text Editing tags  a. H1, h2, h3, h4, h5, h6, p, pre, center, br, hr, b, strong, i, em, u, ins, s, strike, del, sup, sub, big, small  2) Lists  a. Ordered List (ol, li)  b. Unordered list (ul, li)  c. Definition list (dl, dt, dd)  3) Table (table, tr, th, td, thead, tbody, tfoot)  4) Marquee (marquee)  5) Image (img)  6) Hyperlink (a)</p>	2
10	<p>1) Form  a. input (type=text, number, date, email, password, url, range, button, submit, reset, radio, checkbox)  b. textarea  c. label  d. fieldset  e. legend  f. select  g. option  h. optgroup  i. button  j. datalist</p>	2
11	<p>1) div  2) span  3) iframe  4) video  5) audio</p>	2

12	<ol style="list-style-type: none"> <li>1) Introduction of CSS</li> <li>2) Selectors</li> <li>3) Properties &amp; values</li> <li>4) Text Styling Properties <ol style="list-style-type: none"> <li>a. Font-family</li> <li>b. Font-size</li> <li>c. Font-weight</li> <li>d. Text-decoration</li> <li>e. Text-transform</li> <li>f. Color</li> <li>g. Line-height</li> <li>h. Word-spacing</li> <li>i. Text-shadow</li> </ol> </li> <li>5) Text-align</li> <li>6) Box Modal Properties <ol style="list-style-type: none"> <li>a. Width</li> <li>b. Height</li> <li>c. Padding</li> <li>d. Margin</li> <li>e. Border</li> <li>f. Box-shadow</li> <li>g. Border-radius</li> <li>h. Float</li> <li>i. Outline</li> </ol> </li> </ol>	2
13	<ol style="list-style-type: none"> <li>1) Background <ol style="list-style-type: none"> <li>a. Background-color</li> <li>b. Background-image</li> <li>c. Background-repeat</li> <li>d. Background-size</li> <li>e. Background-position</li> <li>f. Background-attachment</li> <li>g. Background (rgba)</li> </ol> </li> <li>2) List (list-style-type, list-style-image)</li> <li>3) Table (border, border-collapse)</li> <li>4) Position</li> <li>5) Z-index</li> <li>6) Opacity</li> </ol>	2
14	<ol style="list-style-type: none"> <li>1) Pseudo-classes <ol style="list-style-type: none"> <li>a. Hover</li> <li>b. Focus</li> <li>c. Active</li> <li>d. Visited</li> <li>e. Link</li> <li>f. Disabled</li> </ol> </li> </ol>	2

	<ul style="list-style-type: none"> <li>g. Enabled</li> <li>h. First-child</li> <li>i. Last-child</li> <li>j. Nth-child (odd,even,2n+1,1)</li> </ul> 2) Designing a simple menu 3) Designing a menu have sub menu	
15	1) Designing a simple home page of a website 2) Designing a Registration page of a website 3) Designing a login page of a website	2

## Foundation of 'JavaScript'

L.N.	Content	Hours
16	1) Introduction of Scripting language 2) Difference between Client & Server Side Scripting 3) Introduction of JavaScript 4) JavaScript Tokens <ul style="list-style-type: none"> <li>a. Keywords</li> <li>b. Identifiers</li> <li>c. Variables</li> <li>d. Data types</li> <li>e. Operators</li> <li>f. Variable declaration</li> </ul> 5) Document object Modal 6) Write & writeln & message (alert) box 7) Events 8) DOM traversing	2
17	1) Conditional Statements (if, else if, nested if, else if ladder) 2) Looping Statements (while, for, do while) 3) Arrays 4) Objects 5) Functions 6) Call function on events	2
18	1) Dialog boxes <ul style="list-style-type: none"> <li>a. Alert Box</li> <li>b. Confirm Box</li> <li>c. Prompt Box</li> </ul> 2) String Functions 3) Number Functions 4) Math's Functions 5) Date Functions	2

19	<ol style="list-style-type: none"> <li>1) Creating a Simple Slider</li> <li>2) Form validation using JavaScript (using regular expression)</li> </ol>	2
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## Fundamentals of 'ReactJS'

L.N.	Content	Hours
23	<ol style="list-style-type: none"> <li>1) Introduction React and its History</li> <li>2) Key Concepts</li> <li>3) Setting up React development environment</li> <li>4) Creating a basic React Component</li> </ol>	2
24	<ol style="list-style-type: none"> <li>1) JSX syntax and expressions in React</li> <li>2) Functional Components</li> <li>3) Classes Components</li> <li>4) Creating and using Components in react</li> <li>5) Props and prop type in react</li> <li>6) Rendering Lists and iterating over data</li> </ol>	2
25	<ol style="list-style-type: none"> <li>1) State and its role in React</li> <li>2) Updating state and re-rendering components</li> <li>3) Handling user events and updating state</li> <li>4) Lifecycle methods in class components</li> </ol>	2
26	<ol style="list-style-type: none"> <li>1) Working with Forms in Route</li> <li>2) Controlled components and form management</li> <li>3) Handling form submission and validation</li> <li>4) Using form libraries and frameworks in React</li> </ol>	2
27	<ol style="list-style-type: none"> <li>1) Introduction to React Router</li> <li>2) Setting up routing in React Application</li> <li>3) Navigating between Route</li> <li>4) Route Parameters and query parameters in React Router</li> </ol>	2

28	<ol style="list-style-type: none"> <li>1) Styling options in React (Inline CSS, CSS Module)</li> <li>2) Theming and dynamic styling in React</li> <li>3) Responsive design in React</li> </ol>	2
29	<ol style="list-style-type: none"> <li>1) Introduction to React Hooks and their benefits</li> <li>2) useState Hook for managing state in functional components</li> <li>3) useEffect Hook for Handling side effects and component lifecycle</li> <li>4) Custom Hooks and their usage for reusable logic</li> </ol>	2

## Fundamentals of 'NODE.JS'

L.N.	Content	Hours
30	<ol style="list-style-type: none"> <li>1) Introduction Node.js and its features</li> <li>2) Installing Node.js and NPM</li> <li>3) Creating a basic Node server</li> <li>4) Handling HTTP Requests and responses in sever</li> </ol>	2
31	<ol style="list-style-type: none"> <li>1) Understating modules in Node.js</li> <li>2) Creating and exporting modules</li> <li>3) Importing and using modules in Node.js</li> <li>4) Reading and writing files with the file system module</li> </ol>	2
32	<ol style="list-style-type: none"> <li>1) Understanding asynchronous programming in Node.js</li> <li>2) Callbacks and handling asynchronous operations</li> <li>3) Promise and async/await for asynchronous flow control</li> </ol>	2
33	<ol style="list-style-type: none"> <li>1) Introduction to database and their role in Node.js</li> <li>2) Connecting to database using Popular database (MongoDB)</li> <li>3) Performing CRUD operations using Node.js</li> </ol>	2

# Fundamentals of 'Express.JS'

L.N.	Content	Hours
34	<ol style="list-style-type: none"><li>1) Introduction to Express.js and its features</li><li>2) Setting up a basics Express.js Server</li><li>3) Handling routes and HTTP requests in Express.js</li><li>4) Understanding the middleware concept in Express.js</li></ol>	2
35	<ol style="list-style-type: none"><li>1) Express routing and its importance in web application</li><li>2) Create Routes with Express.js</li><li>3) Handling route parameters and query parameters</li><li>4) Implementing error handling middleware</li><li>5) Using third-party middleware in Express.js</li></ol>	2
36	<ol style="list-style-type: none"><li>1) Handling form data in Express.js</li><li>2) Parsing form data using middleware</li><li>3) Validating form data with middleware or validation</li><li>4) Displaying form validation errors in Express.js</li></ol>	2



37	<ol style="list-style-type: none"> <li>1) Connecting to database in Express.js</li> <li>2) Performing CRUD operations with database (MongoDB)</li> <li>3) Using Object-Rational mapping</li> </ol>	2
38	<ol style="list-style-type: none"> <li>1) Implementing user authentication in Express.js</li> <li>2) Using sessions and cookies for authentication Express.js</li> <li>3) Hashing and salting passwords for for secure storage</li> </ol>	2
39	<ol style="list-style-type: none"> <li>1) Implementing error handling middleware in Express.js</li> <li>2) Handling different types of errors in Express.js</li> <li>3) Logging error and request Information</li> </ol>	2
40	<ol style="list-style-type: none"> <li>1) Introduction to RESTful API's and their Importance</li> <li>2) Designing RESTful API endpoints in Express.js</li> <li>3) Implementing CRUD operations</li> <li>4) Handling request validation and error response in RESTful API's</li> </ol>	2
41	<ol style="list-style-type: none"> <li>1) Integrating the fronted and backend</li> <li>2) Implementing API calls from React components</li> </ol>	3
42	<ol style="list-style-type: none"> <li>1) Preparing the application for Production</li> </ol>	2
<b><u>43</u></b>	<p><b><u>Project Distribution</u></b>  <b><u>Project Team Divide</u></b>  <b><u>6 to 7 days to Complete project</u></b></p>	<b><u>2*7</u></b>

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<b>L.N.</b>	<b>Content</b>	<b>Hours</b>
30	<ol style="list-style-type: none"><li>5) Introduction of MongoDB</li><li>6) Overview of MongoDB</li><li>7) History of MongoDB</li><li>8) Features of MongoDB</li><li>9) MongoDB Setup</li></ol>	2
31	<ol style="list-style-type: none"><li>1) Create Database</li><li>2) Create Collection</li><li>3) Insert</li><li>4) Find</li><li>5) Join</li><li>6) Limit</li></ol>	2
32	<ol style="list-style-type: none"><li>1) MongoDB Query</li><li>2) MongoDB Sort</li><li>3) MongoDB Delete</li><li>4) MongoDB Update</li><li>5) MongoDB Drop Collection</li></ol>	2

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