

Government of Pakistan

**National Vocational and Technical Training Commission**

**Prime Minister's Youth Skills Development Program ( PMYSDP )**

"Skills for All"



**Course Contents / Lesson Plan**

**Course Title:** Full Stack Development ( MEAN/MERN )

**Duration:** 3 Months

**Revised Edition**

Trainer Name	
Author Name	Zeshan Iqbal Bela CEO   Ez Solutions Lahore
Course Title	<b>Full Stack Development ( MEAN/MERN )</b>
Objectives and Expectations	<p><b>Employable skills and hands-on practice in Full Stack Development ( MEAN/MERN )</b></p> <p>This is a special course designed to address unemployment in the youth. The course aims to achieve the above objective through hands on practical training delivery by a team of dedicated professionals having rich market/work experience. This course is therefore not just for developing a theoretical understanding/back ground of the trainees. Contrary to that, it is primarily aimed at equipping the trainees to perform commercially in a market space in independent capacity or as a member of a team.</p> <p>The course therefore is designed to impart not only technical skills but also soft skills (i.e. interpersonal/communication skills; personal grooming of the trainees etc.) as well as entrepreneurial skills (i.e. marketing skills; free lancing etc.). The course also seeks to inculcate work ethics to foster better citizenship in general and improve the image of Pakistani work force in particular.</p> <p><b><u>Main Expectations:</u></b></p> <p>In short, the course under reference should be delivered by professional instructors in such a robust hands-on manner that the trainees are comfortably able to employ their skills for earning money (through wage/self-employment) at its conclusion.</p> <p>This course thus clearly goes beyond the domain of the traditional training practices in vogue and underscores an expectation that a market-centric approach will be adopted as the main driving force while delivering it. The instructors should therefore be experienced enough to be able to identify the training needs for the possible market roles available out there. Moreover, they should also know the strengths and weaknesses of each trainee to prepare them for such market roles during/after the training.</p> <p>i. Specially designed practical tasks to be performed by the trainees have been included in the Annexure-I to this document. The record of all tasks performed individually or in groups must be preserved by the management of the training Institute clearly labeling name, trade, session, etc. so that these are ready to be physically inspected/verified through monitoring visits from time to time. The weekly distribution of tasks has also been indicated in the weekly lesson plan given in this document.</p> <p>ii. To materialize the main expectations, a special module on <b><u>Job Search &amp; Entrepreneurial Skills</u></b> has been included in the latter part of this course (5<sup>th</sup> &amp; 6<sup>th</sup> month) through which, the trainees will be made aware</p>

of the Job search techniques in the local as well as international job markets (Gulf countries). Awareness around the visa process and immigration laws of the most favored labor destination countries also form a part of this module. Moreover, the trainees would also be encouraged to venture into self-employment and exposed to the main requirements in this regard. It is also expected that a sense of civic duties/roles and responsibilities will also be inculcated in the trainees to make them responsible citizens of the country.

- iii. A module on **Work Place Ethics** has also been included to highlight the importance of good and positive behavior in the workplace in the line with the best practices elsewhere in the world. An outline of such qualities has been given in the Appendix to this document. Its importance should be conveyed in a format that is attractive and interesting for the trainees such as through PPT slides +short video documentaries. Needless to say that if the training provider puts his heart and soul into these otherwise non-technical components, the image of the Pakistani workforce would undergo a positive transformation in the local as well as international job markets.

To maintain interest and motivation of the trainees throughout the course, modern techniques such as:

- Motivational Lectures
- Success Stories
- Case Studies

These techniques would be employed as an additional training tool wherever possible (these are explained in the subsequent section on Training Methodology).

Lastly, evaluation of the competencies acquired by the trainees will be done objectively at various stages of the training and a proper record of the same will be maintained. Suffice to say that for such evaluations, practical tasks would be designed by the training providers to gauge the problem-solving abilities of the trainees.

#### (i) **Motivational Lectures**

The proposed methodology for the training under reference employs motivation as a tool. Hence besides the purely technical content, a trainer is required to include elements of motivation in his/her lecture. To inspire the trainees to utilize the training opportunity to the full and strive towards professional excellence. Motivational lectures may also include general topics such as the importance of moral values and civic role & responsibilities as a Pakistani. A motivational lecture should be delivered with enough zeal to produce a deep impact on the trainees. It may comprise of the following:

- Clear Purpose to convey the message to trainees effectively.
- Personal Story to quote as an example to follow.
- Trainees Fit so that the situation is actionable by trainees and not represent a just idealism.
- Ending Points to persuade the trainees on changing themselves.

A good motivational lecture should help drive creativity, curiosity, and spark the desire needed for trainees to want to learn more.

The impact of a successful motivational strategy is amongst others commonly visible in increased class participation ratios. It increases the trainees' willingness to be engaged on the practical tasks for a longer time without boredom and loss of interest because they can see in their mind's eye where their hard work would take them in short (1-3 years); medium (3 -10 years) and long term (more than 10 years).

As this tool is expected that the training providers would make arrangements for regular well planned motivational lectures as part of a coordinated strategy interspersed throughout the training period as suggested in the weekly lesson plans in this document.

Course-related motivational lectures online link is available in **Annexure-II**.

### **(ii) Success Stories**

Another effective way of motivating the trainees is using Success Stories. Its inclusion in the weekly lesson plan at regular intervals has been recommended till the end of the training.

A success story may be disseminated orally, through a presentation, or using a video/documentary of someone that has risen to fortune, acclaim, or brilliant achievement. A success story shows how a person achieved his goal through hard work, dedication, and devotion. An inspiring success story contains compelling and significant facts articulated clearly and easily comprehensible words. Moreover, it is helpful if it is assumed that the reader/listener knows nothing of what is being revealed. The optimum impact is created when the story is revealed in the form of:-

- Directly in person (At least 2-3 cases must be arranged by the training institute)
- Through an audio/ videotaped message (2-3 high-quality videos must be arranged by the training institute)

It is expected that the training provider would collect relevant high-quality success stories for inclusion in the training as suggested in the weekly lesson plan given in this document.

The suggestive structure and sequence of a sample success story and its various shapes can be seen in **Annexure III**.

### **(iii) Case Studies**

Where a situation allows, case studies can also be presented to the trainees to widen their understanding of the real-life specific problem/situation and to explore the solutions.

In simple terms, the case study method of teaching uses a real-life case example/a typical case to demonstrate a phenomenon in action and explain theoretical as well as practical aspects of the knowledge related to the same. It is an effective way to help the trainees comprehend in depth both the theoretical and practical aspects of the complex phenomenon in depth with ease. Case teaching can also stimulate the trainees to participate in

	<p>discussions and thereby boost their confidence. It also makes the classroom atmosphere interesting thus maintaining the trainee interest in training till the end of the course.</p> <p>Depending on suitability to the trade, the weekly lesson plan in this document may suggest case studies be presented to the trainees. The trainer may adopt a PowerPoint presentation or video format for such case studies whichever is deemed suitable but only those cases must be selected that are relevant and of a learning value.</p> <p>The Trainees should be required and supervised to carefully analyze the cases.</p> <p>For this purpose, they must be encouraged to inquire and collect specific information/data, actively participate in the discussions, and intended solutions to the problem/situation.</p> <p>Case studies can be implemented in the following ways: -</p> <ol style="list-style-type: none"> <li>i. A good quality trade-specific documentary ( At least 2-3 documentaries must be arranged by the training institute)</li> <li>ii. Health &amp; Safety case studies (2 cases regarding safety and industrial accidents must be arranged by the training institute)</li> <li>iii. Field visits( At least one visit to a trade-specific major industry/ site must be arranged by the training institute)</li> </ol>
<b>Entry-level of trainees</b>	<p>For an advanced course of Full Stack Developer ( MEAN/MERN ) proposed entry level is minimum bachelors in relevant subject, so expectations from the trainees are:</p> <ul style="list-style-type: none"> <li>• Have knowledge of Programming Concepts</li> <li>• Have concept of Computer system</li> <li>• Having a knowledge of basic electronics</li> </ul>
<b>Learning Outcomes of the course</b>	<p>By the end of this course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. Create software development lifecycle documentation. Identify and work with well-known CMS (Php+MySQL Based - WordPress)</li> <li>2. Install and configure Visual Studio code. Create a basic project in visual studio.</li> <li>3. Apply Basic Java Script Methods, conditions, loops and functions in Java Script.</li> <li>4. Setup React JS environment, work with JSX and Apply React JS Components</li> <li>5. Identify and apply styling components, and advanced components in React JS</li> <li>6. Apply exceptions and error handling. Apply routers and component life cycle in React.JS</li> <li>7. Setup node JS environment and apply basic Node.js components and modules. Work with node Package Manager (NPM)</li> <li>8. Create web server using node.js Work with file server. Debug Node.JS application and work with events in node.js</li> <li>9. Work with express.JS and with MongoDB</li> </ol>

	10. Perform QA and Application Deployment 11. Capstone Project
<b>Course Execution Plan</b>	The total duration of the course: <b>4 months (16 Weeks)</b> Class hours: <b>4 hours per day</b> Theory: <b>20%</b> Practical: <b>80%</b> Weekly hours: <b>20 hours per week</b> Total contact hours: <b>260 hours</b>
<b>Companies offering jobs in the respective trade</b>	<ul style="list-style-type: none"> <li>• Healthcare: The healthcare industry is using Web and Software development to improve patient care and increase efficiency. Medical device companies, hospitals, and research institutions are all looking for individuals with Full Stack Development skills to help them develop and implement new technologies.</li> <li>• Manufacturing: Web/Software Development is being used in manufacturing to automate processes and increase efficiency. Companies such as Ford, General Motors, and Toyota are investing heavily in web/software and are looking for individuals with the necessary skills to help them develop and maintain their web portals.</li> <li>• Finance: The finance industry is using web/software development to analyze data, identify patterns, and make predictions. Banks, insurance companies, and investment firms are all looking for individuals with Full Stack Development skills to help them improve their services and increase profits.</li> <li>• Agriculture: Full Stack Development is being used in agriculture to automate tasks such as planting, harvesting, and monitoring crops. Companies such as John Deere and Monsanto are investing in web/software development technologies and are looking for individuals with the necessary skills to help them develop and implement new systems.</li> </ul>
<b>Job Opportunities</b>	<ul style="list-style-type: none"> <li>• Web Designer &amp; Developer</li> <li>• Software Designer &amp; Developer</li> <li>• Full Stack Web Developer</li> <li>• Full Stack Software Developer</li> </ul>
<b>No of Students</b>	25
<b>Learning Place</b>	Classroom / Lab

<b>Instructional Resources</b>	<ol style="list-style-type: none"> <li>1. WordPress Customization with Porto Theme For E Commerce - Urdu/Hindi: <a href="https://www.youtube.com/watch?v=ju2QKM7Jdc4">https://www.youtube.com/watch?v=ju2QKM7Jdc4</a>  This is another WordPress Customization video. In this video i have explained about, how you can customize WordPress Website with Porto Theme and E commerce demo.</li> <li>2. Zeshan Bela   Author's Channel for related Web/Software Developments: <a href="https://www.youtube.com/@zeshanbela">https://www.youtube.com/@zeshanbela</a>  This youtube channel provides updated knowledge on full stack development, e commerce and digital marketing.</li> <li>3. Mern stack Ecommerce App Lets Build And Deploy Mern Stack Project full-stack development: <a href="https://youtu.be/A_-fn_ij59c?si=w2O9ei3e4I7zwwVZ">https://youtu.be/A_-fn_ij59c?si=w2O9ei3e4I7zwwVZ</a>  In this MERN stack tutorial, we'll walk you through the process of building a full-stack web application using MongoDB, Express, React, and Node.js. You'll learn how to build a responsive and dynamic user interface with React, create a back-end API with Express and Node.js, and store data in a NoSQL database with MongoDB. This step-by-step web development tutorial is perfect for beginners who want to learn how to build full-stack web applications from scratch. By the end of this video, you'll have a solid understanding of the MERN stack and be ready to take your web development skills to the next level</li> <li>4. Introduction to MERN stack   Complete React Course: <a href="https://youtu.be/YhJ-IPiCfyc?si=wJqZgecf2gCIMWd0">https://youtu.be/YhJ-IPiCfyc?si=wJqZgecf2gCIMWd0</a>  In this react course, we will see how to learn react using projects. This is going to be a project-based course full of real-world react projects</li> <li>5. Trainings and Workshops by Ez Solutions: <a href="https://www.ezsols.com/trainings">https://www.ezsols.com/trainings</a>  From Ez Solutions, you can have free trainings and workshop on the full stack development in Lahore, Pakistan.</li> </ol>
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**MODULES**

Schedu led Weeks	Module Title	Days




Week 2	Install and configure Visual Studio code. Create a basic project in visual studio.	Day 1	Hour 1 to 4	<p>Overview of VS Code: Explanation of its features, user interface, and advantages.</p> <p>Downloading and installing VS Code on different operating systems (Windows, macOS, Linux).</p>	<p>•Task 2</p> <p><u>Details may be seen at Annexure-I</u></p>
			Hour 3 & 4		
		Day 2	Hour 1 to 4	<p>Walkthrough of the VS Code interface: Editor layout, sidebar navigation, and basic settings.</p> <p>Basic configurations: Setting up themes, extensions, and keyboard shortcuts for efficient usage.</p>	

		Day 3	Hour 1 to 4	Step-by-step guide to create a simple project in VS Code (e.g., a basic HTML/CSS webpage or a small JavaScript application).	
		Day 4	Hour 1 to 4	Explaining file structure, creating files/folders, and using the integrated terminal within VS Code.	

		Day 5	Hour 1 to 4	<p>Live demonstrations on debugging a simple application in VS Code, identifying and fixing basic errors.</p> <p>Introduction to debugging: Configuring launch configurations, breakpoints, and watching variables.</p>	
Week 3	Apply Basic Java Script Methods, conditions, loops and functions in Java Script	Day 1	Hour 1 & 2	<p>Overview of JavaScript: Explanation of its role in web development and basic syntax.</p> <p>Introduction to JavaScript Basics with Setting up VS Code for JavaScript development: Installing necessary extensions and configuring settings</p>	<p><b>•Task 3</b></p> <p><u>Details may be seen at Annexure-I</u></p>
			Hour 3 & 4	<p>Setting up VS Code for JavaScript development: Installing necessary extensions and configuring settings.</p>	

		Day 2	Hour 1 & 2	Understanding JavaScript Methods. Explaining basic JavaScript methods (e.g., string, array methods).
			Hour 3 & 4	Hands-on practice using methods like .concat(), .toUpperCase(), .push(), etc., with sample data.
		Day 3	Hour 1 & 2	Working with Conditions and Loops. Introduction to JavaScript conditional statements (if, else if, else) and loops (for, while).
			Hour 3 & 4	Practical coding exercises applying conditions and loops to solve basic problems.
		Day 4	Hour 1 & 2	Functions in JavaScript. Understanding JavaScript functions: Declaration, parameters, return values, and scope.
			Hour 3 & 4	Writing functions for different purposes and using them within simple scripts.
		Day 5	Hour 1 & 2	Applying JavaScript Concepts in Projects. Integrating learned concepts into small projects or scripts: Combining methods, conditions, loops, and functions.

			Hour 3 & 4	Practical exercises involving problem-solving and applying JavaScript in real-world scenarios.	
Week 4	Setup React JS environment, work with JSX and Apply React JS Components	Day 1	Hour 1 & 2	Introduction to React JS. Overview of React JS: Explanation of its role in building user interfaces and its advantages.	<b>•Task 4</b> <u>Details may be seen at Annexure-I</u>
			Hour 3 & 4	Setting up the React environment: Installing Node.js, creating a React project using Create React App, and setting up VS Code for React development.	
		Day 2	Hour 1 & 2	Understanding JSX in React. Introduction to JSX (JavaScript XML): Understanding JSX syntax and its relation to JavaScript.	
			Hour 3 & 4	Hands-on practice with JSX elements, attributes, and expressions within React components.	
		Day 3	Hour 1 & 2	Working with React Components. Explanation of React components: Functional vs. class components, props, and state.	
			Hour 3 & 4	Practical coding exercises to create and use React components, passing props, and managing state.	

		Day 4	Hour 1 & 2	Advanced React Components and Props. Advanced React component concepts: Lifecycle methods, event handling, and conditional rendering.	
			Hour 3 & 4	Writing and utilizing advanced components, managing state updates, and passing props dynamically.	
		Day 5	Hour 1 & 2	Applying React Components in Projects. Integrating learned concepts into small React projects or applications.	
			Hour 3 & 4	Practical exercises involving the creation of multiple components, managing state, and rendering dynamic content.	
Week 5	Identify and apply styling components, and advanced components in React JS	Day 1	Hour 1 & 2	Introduction to Styling in React. Overview of styling approaches in React: Inline styles, CSS modules, and CSS-in-JS libraries like styled-components.	<b>•Task 5</b>  <u>Details may be seen at Annexure-I</u>
			Hour 3 & 4	Setting up styling methods in React: Configuring CSS modules or styled-components in a React project within VS Code.	
		Day 2	Hour 1 & 2	Working with CSS Modules. Understanding CSS Modules: Scoping styles to components, importing and applying	

				CSS classes in React.	
			Hour 3 & 4	Hands-on practice creating and applying CSS Modules to React components, organizing styles effectively.	
		Day 3	Hour 1 & 2	Exploring Styled Components. Introduction to styled-components: Syntax, benefits, and usage within React applications.	
			Hour 3 & 4	Practical coding exercises using styled-components to style React components dynamically.	
		Day 4	Hour 1 & 2	Implementing Advanced Components with Styling. Advanced React component styling: Exploring conditional styling, dynamic styles, and responsive design techniques.	
			Hour 3 & 4	Writing advanced components with styled-components or advanced styling approaches, incorporating CSS animations or transitions.	
		Day 5	Hour 1 & 2	Applying Styling and Advanced Components in Projects. Integrating styling components and advanced component techniques into larger React projects or	



				applications.	
			Hour 3 & 4	Practical exercises involving the implementation of complex UIs, responsive design elements, and dynamic styling effects.	
Week 6	Apply exceptions and error handling. Apply routers and component life cycle in React.JS	Day 1	Hour 1 & 2	Understanding Exceptions and Error Handling in JavaScript. Explanation of exceptions and error handling in JavaScript: Try-catch blocks, throw statements, and handling errors gracefully.	<b>•Task 6</b>  <u>Details may be seen at Annexure-I</u>
			Hour 3 & 4	Exploring common JavaScript errors and best practices for error handling.	
		Day 2	Hour 1 & 2	Implementing Error Boundaries in React. Introduction to error boundaries in React: Identifying error boundaries, componentDidCatch method, and error handling strategies.	
			Hour 3 & 4	Hands-on practice creating and implementing error boundaries in React components.	

		Day 3	Hour 1 & 2	Introduction to React Router. Overview of React Router: Explanation of routing in React, BrowserRouter, Route, Link components, and navigation concepts.	
			Hour 3 & 4	Practical coding exercises using React Router for basic routing and navigation in a React application.	
		Day 4	Hour 1 & 2	Advanced Routing Techniques with React Router. Advanced React Router features: Nested routes, route parameters, programmatic navigation, and route guards.	
			Hour 3 & 4	Writing and implementing advanced routing scenarios using React Router.	
		Day 5	Hour 1 & 2	Exploring Component Lifecycle in React. Understanding React component lifecycle methods: Mounting, updating, and unmounting phases.	
			Hour 3 & 4	Practical exercises demonstrating the use of lifecycle methods for managing state, side effects, and optimizing performance.	

Week 7	Setup node JS environment and apply basic Node.js components and modules. Work with node Package Manager (NPM)	Day 1	Hour 1 & 2	Introduction to Node.js and Environment Setup. Overview of Node.js: Explanation of its features, server-side capabilities, and use cases.	<b>•Task 7</b>  <u>Details may be seen at Annexure-I</u>
			Hour 3 & 4	Installing Node.js and setting up the development environment in Visual Studio Code (VS Code).	
		Day 2	Hour 1 & 2	Understanding Basic Node.js Components. Introduction to Node.js modules: Creating, exporting, and importing modules in Node.js.	
			Hour 3 & 4	Hands-on practice creating simple modules, importing them into other files, and utilizing their functionalities.	
		Day 3	Hour 1 & 2	Exploring Node.js Core Modules. Overview of Node.js core modules: fs (file system), http, path, etc.	
			Hour 3 & 4	Practical coding exercises using Node.js core modules for file operations, HTTP server creation, and path manipulation.	
		Day 4	Hour 1 & 2	Working with Node Package Manager (NPM). Introduction to NPM: Installing packages, managing dependencies, and using NPM scripts.	

			Hour 3 & 4	Hands-on practice installing packages, creating a package.json file, and utilizing NPM commands for package management.	
		Day 5	Hour 1 & 2	Advanced NPM Features and Publishing Packages. Exploring advanced NPM features: Semantic versioning, package publishing, and updating packages.	
			Hour 3 & 4	Practical exercises involving publishing a basic package to the NPM registry and managing versions.	
Week 8	Create web server using node.js. Work with file server. Debug Node.JS application and work with events in node.js	Day 1	Hour 1 & 2	Creating a Basic Web Server with Node.js. Introduction to creating web servers in Node.js: Overview of HTTP module and server creation.	<b>•Task 8</b> <u>Details may be seen at Annexure-I</u>
			Hour 3 & 4	Writing a simple Node.js script to create a basic web server, handling requests, and sending responses.	
		Day 2	Hour 1 & 2	Implementing a File Server in Node.js. Understanding file system operations in Node.js: Reading, writing, and serving files.	

			Hour 3 & 4	Creating a file server using Node.js to handle file requests, read files, and serve them over HTTP.	
		Day 3	Hour 1 & 2	Debugging Node.js Applications. Introduction to debugging in Node.js: Using console.log, debugging with VS Code, and utilizing the Node.js debugger.	
			Hour 3 & 4	Practical debugging exercises to troubleshoot and fix basic issues in Node.js applications.	
		Day 4	Hour 1 & 2	Working with Events in Node.js. Understanding the EventEmitter class and event handling in Node.js.	
			Hour 3 & 4	Writing code examples involving EventEmitter to emit and listen to events within Node.js applications.	
		Day 5	Hour 1 & 2	Advanced Event Handling in Node.js.Exploring more complex event-driven patterns and scenarios in Node.js applications.	
			Hour 3 & 4	Practical exercises involving the use of events for asynchronous communication and handling multiple events.	

Week 9	Work with express.JS and with MongoDB	Day 1	Hour 1 & 2	Creating a Basic Web Server with Node.js. Introduction to creating web servers in Node.js: Overview of HTTP module and server creation.	<b>•Task 9</b>  <u>Details may be seen at Annexure-I</u>
			Hour 3 & 4	Writing a simple Node.js script to create a basic web server, handling requests, and sending responses.	
		Day 2	Hour 1 & 2	Implementing a File Server in Node.js. Understanding file system operations in Node.js: Reading, writing, and serving files.	
			Hour 3 & 4	Creating a file server using Node.js to handle file requests, read files, and serve them over HTTP.	
		Day 3	Hour 1 & 2	Debugging Node.js Applications. Introduction to debugging in Node.js: Using console.log, debugging with VS Code, and utilizing the Node.js debugger.	
			Hour 3 & 4	Practical debugging exercises to troubleshoot and fix basic issues in Node.js applications.	
		Day 4	Hour 1 & 2	Working with Events in Node.js. Understanding the EventEmitter class and event handling in Node.js.	

			Hour 3 & 4	Writing code examples involving EventEmitter to emit and listen to events within Node.js applications.	
		Day 5	Hour 1 & 2	Advanced Event Handling in Node.js. Exploring more complex event-driven patterns and scenarios in Node.js applications.	
			Hour 3 & 4	Practical exercises involving the use of events for asynchronous communication and handling multiple events.	
Week 10	Perform QA and Application Deployment	Day 1	Hour 1 & 2	Introduction to Quality Assurance (QA). Overview of QA: Understanding the importance of QA in software development.	<b>•Task 10</b>  <u>Details may be seen at Annexure-I</u>
			Hour 3 & 4	Explaining different types of testing: Unit testing, integration testing, system testing, etc.	
		Day 2	Hour 1 & 2	Implementing Testing Strategies. Introduction to testing frameworks/tools: Jest, Mocha, Selenium, etc.	
			Hour 3 & 4	Hands-on practice writing and executing basic test cases for applications using selected testing frameworks.	

		Day 3	Hour 1 & 2	Understanding Continuous Integration/Continuous Deployment (CI/CD). Overview of CI/CD pipelines: Understanding automated testing, building, and deployment processes.	
			Hour 3 & 4	Setting up a basic CI/CD pipeline using tools like Jenkins, GitLab CI/CD, or GitHub Actions.	
		Day 4	Hour 1 & 2	Performing End-to-End Testing. Exploring end-to-end testing: Writing automated tests for complete application flows.	
			Hour 3 & 4	Practical exercises performing end-to-end testing for an application, covering user scenarios and functionalities.	
		Day 5	Hour 1 & 2	Application Deployment Strategies. Introduction to deployment strategies: Blue-green deployment, canary deployment, rolling updates, etc.	
			Hour 3 & 4	Deploying an application to a cloud platform (e.g., AWS, Heroku) using selected deployment strategies.	



Week 11	Capstone Project	Day 1	Hour 1 to 4	<b>Project Planning and Ideation</b>  Overview of Capstone Project: Explanation of expectations, scope, and deliverables.  Discussing project ideas, brainstorming, and selecting a suitable project topic.	<b>•Task 11</b>  <u>Details may be seen at Annexure-I</u>
		Day 2	Hour 1 to 4	<b>Project Design and Documentation</b>  Creating project design documents: Project scope, requirements, wireframes, and mockups.  Drafting a detailed project plan, including timelines, milestones, and task allocation.	
		Day 3	Hour 1 to 4	<b>Development Phase - Part 1</b>  Commencement of project development: Setting up the project environment, initializing the codebase, and working on essential functionalities.	

		<b>Day 4</b>	<b>Hour 1 to 4</b>	<b>Development Phase - Part 2</b>  Continuing with the project development: Implementing core features, functionalities, and integrating necessary APIs or services.	
		<b>Day 5</b>	<b>Hour 1 to 4</b>	<b>Finalizing and Presentation Preparation</b>  Finalizing the Capstone Project: Conducting testing, debugging, and refining the project.  Preparing the project presentation: Compiling project documentation, creating slides, and rehearsing the presentation.	

Week 12	Create Freelancing Proficiency on Digital Platforms	Day 1	Hour 1 to 4	<b>Introduction to Freelancing on Digital Platforms</b>  Overview of digital freelancing: Explanation of various platforms (Upwork, Fiverr, Freelancer, etc.), types of projects available, and skill requirements.  Understanding the benefits, challenges, and strategies for success in the digital freelancing landscape.	<b>•Task 12</b> <u>Details may be seen at Annexure-I</u>
		Day 2	Hour 1 to 4	<b>Profile Creation and Optimization</b>  Guide on setting up an effective freelancer profile: Creating a compelling bio, selecting skills, showcasing portfolios, and highlighting expertise.  Optimizing profiles on popular freelancing platforms with relevant keywords and best practices.	
		Day 3	Hour 1 to 4	<b>Understanding Client Communication and Proposals</b>  Exploring effective client communication: Strategies for professional interaction, understanding client needs, and crafting compelling proposals.  Conducting role plays or mock scenarios to practice effective communication and proposal writing.	

		<b>Day 4</b>	<b>Hour 1 to 4</b>	<b>Project Management and Time Tracking Tools</b>  Introduction to project management tools (Trello, Asana) and time tracking software (Toggl, Harvest).  Practical exercises on managing freelance projects, organizing tasks, and tracking time spent on different projects.	
		<b>Day 5</b>	<b>Hour 1 to 4</b>	<b>Finances, Contracts, and Building Reputation</b>  Understanding financial aspects: Setting rates, creating contracts, invoicing, and managing payments as a freelancer.  Strategies for building a positive reputation, securing reviews, and handling feedback on digital freelancing platforms.	

**Tasks for Certificate in Full Stack Developer ( MEAN/MERN )**

<b>Task No.</b>	<b>Task</b>	<b>Description</b>	<b>Week</b>
<b>1.</b>	Create software development lifecycle documentation. Identify and work with well-known CMS (Php+MySql Based - WordPress)	Develop documentation outlining software development lifecycle phases and explore prominent PHP+MySQL-based CMS, such as WordPress, for practical application.	<b>Week 1</b>
<b>2.</b>	Install and configure Visual Studio code. Create a basic project in visual studio.	Set up Visual Studio Code environment, then initiate a fundamental project within the platform for practical learning purposes.	<b>Week 2</b>
<b>3.</b>	Apply Basic Java Script Methods, conditions, loops and functions in Java Script.	Utilize essential JavaScript functionalities encompassing methods, conditions, loops, and functions for practical application and understanding.	<b>Week 3</b>
<b>4.</b>	Setup React JS environment, work with JSX and Apply React JS Components	Establish React JS environment, employ JSX syntax, and implement React components for practical learning and application purposes.	<b>Week 4</b>
<b>5.</b>	Identify and apply styling components, and advanced components in React JS	Recognize and implement styling components alongside advanced components within React JS for practical implementation and advanced understanding.	<b>Week 5</b>
<b>6.</b>	Apply exceptions and error handling. Apply routers and component life cycle in React.JS	Implement error handling, incorporate routers, and manage component lifecycle in React.js to ensure robustness and efficient functionality of applications.	<b>Week 6</b>
<b>7.</b>	Setup node JS environment and apply basic Node.js components and modules. Work with node Package Manager (NPM)	Establish Node.js environment, utilize fundamental Node.js components/modules, and operate with Node Package Manager (NPM) for practical application and understanding in development.	<b>Week 7</b>

8.	Create web server using node.js Work with file server. Debug Node.JS application and work with events in node.js	Develop a web server in Node.js, manage a file server, debug Node.js applications, and handle events within Node.js for enhanced application functionality and error resolution.	<b>Week 8</b>
9.	Work with express.JS and with MongoDB	Utilize Express.js framework in conjunction with MongoDB database for building robust and efficient applications, leveraging Express.js for server-side functionalities and MongoDB for data storage and retrieval.	<b>Week 9</b>
10.	Perform QA and Application Deployment	Execute Quality Assurance (QA) procedures and implement Application Deployment methodologies for ensuring software reliability and successful deployment in production environments.	<b>Week 10</b>
11.	Capstone Project	Undertake and finalize a comprehensive Capstone Project, applying acquired skills and knowledge to create a significant, culminating piece of work in the learning journey.	<b>Week 11</b>
12.	Create Freelancing Proficiency on Digital Platforms	Develop proficiency in digital freelancing by covering profile optimization, client communication, project management tools, financial aspects, and reputation building on popular platforms in a week-long course.	<b>Week 12</b>

**Motivational Lectures  
Full Stack Developer ( MEAN/MERN )**

**Learn Canva, ChatGPT, and Pictory and Earn Money:**

**<https://www.youtube.com/watch?v=qKMnWI6NE9k>**

In this video, Zeshan Bela, an entrepreneur, founder and managing director of Ez Solutions, A2Z e Commerce and Double Click Pro USA, teaches you how to use Canva, ChatGPT, and Pictory to create stunning graphics and earn money. Canva is a popular graphic design tool that allows you to create eye-catching designs for social media, marketing, and more. ChatGPT is a cutting-edge AI-powered language model that can help you generate text for your designs, while Pictory is an AI based platform, where you can generate stunning videos.

**How to become a mern stack developer? (Hindi):**

**<https://www.youtube.com/watch?v=-yoW2IzCuZ0>**

In this video we will discuss that how you can become a front end developer with a stack of MongoDB, Express.js, React & Node.

**MERN Stack Full Tutorial | Web Development in MERN Stack | Complete All-in-One Course2023 | 11 Hours:**

**<https://www.youtube.com/watch?v=IGF3l85Ks2k>**

In this free course on MERN Stack by Azadchaiwala, you will have the opportunity to build a crypto blog app and learn the ins and outs of the MERN stack. Throughout the course, you'll not only gain practical experience in both frontend and backend development, but you'll also learn best practices for each.

## **Workplace/Institute Ethics Guide**

Work ethic is a standard of conduct and values for job performance. The modern definition of what constitutes good work ethics often varies. Different businesses have different expectations. Work ethic is a belief that hard work and diligence have a moral benefit and an inherent ability, virtue, or value to strengthen character and individual abilities. It is a set of values-centered on the importance of work and manifested by determination or desire to work hard.

The following ten work ethics are defined as essential for student success:

**1. Attendance:**

Be at work every day possible, plan your absences don't abuse leave time. Be punctual every day.

**2. Character:**

Honesty is the single most important factor having a direct bearing on the final success of an individual, corporation, or product. Complete assigned tasks correctly and promptly. Look to improve your skills.

**3. Team Work:**

The ability to get along with others including those you don't necessarily like. The ability to carry your weight and help others who are struggling. Recognize when to speak up with an idea and when to compromise by blend ideas together.

**4. Appearance:**

Dress for success set your best foot forward, personal hygiene, good manner, remember that the first impression of who you are can last a lifetime

**5. Attitude:**

Listen to suggestions and be positive, accept responsibility. If you make a mistake, admit it. Values workplace safety rules and precautions for personal and co-worker safety. Avoids unnecessary risks. Willing to learn new processes, systems, and procedures in light of changing responsibilities.

**6. Productivity:**

Do the work correctly, quality and timelines are prized. Get along with fellows, cooperation is the key to productivity. Help out whenever asked, do extra without being asked. Take pride in your work, do things the best you know-how. Eagerly focuses energy on accomplishing tasks, also referred to as demonstrating ownership. Takes pride in work.

**7. Organizational Skills:**



Make an effort to improve, learn ways to better yourself. Time management; utilize time and resources to get the most out of both. Take an appropriate approach to social interactions at work. Maintains focus on work responsibilities.

**8. Communication:**

Written communication, being able to correctly write reports and memos.  
Verbal communications, being able to communicate one on one or to a group.

**9. Cooperation:**

Follow institute rules and regulations, learn and follow expectations. Get along with fellows, cooperation is the key to productivity. Able to welcome and adapt to changing work situations and the application of new or different skills.

**10. Respect:**

Work hard, work to the best of your ability. Carry out orders, do what's asked the first time. Show respect, accept, and acknowledge an individual's talents and knowledge. Respects diversity in the workplace, including showing due respect for different perspectives, opinions, and suggestions.