

Devi Ahilya Vishwavidhyalaya, Indore, India Institute of Engineering & Technology				II Year B.Tech. (Information Technology)		
Course Code & Name		Instructions Hours per Semester and Credits				
4RIPC3 WEB TECHNOLOGIES	Classroom Instruction (CI)		Lab Instruction (LI)	Term Work (TW) and Self Learning (SL)	Total no. of Hours Per semester	Total Credits (Total Hours/30)
	L	T	P	TW+SL		
	20	10	20	70	120	4

Course Learning Objectives:

- Introduce the students to emerging web technologies
- Introduce the students with HTML, CSS & JavaScript concepts and its application
- Motivate the students to develop 3 tier web applications
- Understanding of server side programming using MERN Stack
- Deployment, Production & Testing

Prerequisite: NIL

COURSE CONTENTS

UNIT-I

Introduction to Web Technology: WWW and Protocols: HTTP, DNS, SMTP etc.

Web Servers - Web Browsers, HTTP Request and Response Types

Introduction to HTML5 (Elements, Attributes, Hyperlinks, Forms, div, Tables, links, images), IDEs

Cascading Style Sheets- using CSS, Attributes, inline styles, colors and properties, using fonts,

Borders and Boxes, Margins, Positioning, Flexbox, Animation and transition effects with CSS3,

Developer Tools

JavaScript: JavaScript and Variables, Functions, Operators, Conditions, loops, event loops, objects, arrays, Synchronous Vs Asynchronous code, I/O, Async, Await, promises, callbacks

UNIT-II

Advanced JS: DOM, Http servers, JSON, Https Headers

Node JS: Introduction, Advantages, Setup Dev Environment, Node JS Modules: Functions, Module,

Module Types, Core Modules, Local Modules, Module Exports; Node Package Manager, Creating Web server: Creating http server, Middleware, Authentication, Tokens, JWT, Handling http requests, Sending requests, Axios Vs Fetch, File System, Events, Template Engines, Fetch API, CORS

UNIT-III

Express JS : Overview, Environment, Routing, HTTP Methods, URL Building, Middleware, Templating, Static Files, Form Data, Database, Cookies, Sessions, Authentication, REST APIs, Scaffolding, Error handling, connecting Frontend to Backend, Git, Bash and Terminal

React JS: Features, Advantages, Limitations, Environment Setup, Building Component, Render function, Context API, Component lifecycle, State, Props, Types and Interfaces, JSX, React Pure Component, Component Life Cycle, Rolling up the state, Events, Routing, Component Inter Communication, Higher-Order Component, HOOKS, Custom hooks, Recoil, Typescript, Tailwind, ESLint; Web sockets, Introduction to Nextjs

UNIT-IV

Mongo DB: Databases, MongoDB and NoSQL, Creating MongoDB Server, The Mongo Shell, seeding data, creating backend of an app, Hashing Passwords, Err handling, Input validation, Zod, Relations in MongoDB, Architecture, and Installation, Mongoose, atlas, compass, ORMs

CRUD Operations: CRUD (Creating, Reading & Updating Data) Operations, Functional usage, Read / Write Operations with CRUD, Query Operators and Commands

UNIT-V

XML Technologies: Introduction of XML, Validation of XML documents, DTD, XML for data files, HTML vs XML, Embedding XML into HTML documents, Displaying XML using CSS and XSL

Schema Design and Data Modelling: Schema Design and Data Modelling, Indexing and Performance Considerations, Aggregation, CSR, SSR, Static Sites, Testing, Unit Testing Components, CI/CD, Monitoring

Course Outcomes:

CO.No.	CO
CO1	To describe the concepts of WWW including browser and HTTP protocol, Develop the modern web pages using the HTML5 and CSS3 features with different layouts as per the need of applications.
CO2	To use JavaScript to develop the dynamic web pages and validate data entered by users through forms
CO3	To understand React Library and how the frontend of a web page is designed using it.
CO4	To use MERN Stack to generate the web pages dynamically using the database connectivity.

CO5	To Develop modern Web Applications using the client and server-side technologies and the web design fundamentals.
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Books Recommended:

1. Pro MERN Stack, 2nd Edition - Vasam Subramanian
2. Steven M. Schafer, “HTML, XHTML and CSS”, Fourth Edition by, Wiley India Edition.
3. HTML 5, Black Book, Dreamtech Press
4. Web Technologies, Black Book, Dreamtech Press
5. Web Design, Joel Sklar, Cengage Learning
6. Web Technologies – Achyut S Godbole and Atul Kahate

CO-PO-PSO Relationship

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
4RIPC3.CO1	3	2	1									3	2	1
4RIPC3.CO2	3	3	2		1							3	3	2
4RIPC3.CO3	3	3	3	2	3							3	3	3
4RIPC3.CO4	3	3	3		2							2	3	3
4RIPC3.CO5	3	2	2		2							2	2	3

List of Practical Assignments:

During the learning of course, students need to do assignments:

1. Design web pages using HTML5- landing pages
2. Style web pages using CSS3 features
3. Accepting and validating user entered data using JavaScript.
4. Develop a Dice Roller Game using JavaScript.
5. Setup MERN Stack Environment and connecting frontend to backend
6. Develop a complex Calculator App using React js.
7. Build a google Form clone using React js.
8. Create a web app using React js.
9. Setup a Mock API Server and Fetch Data from an API.
10. Create API to fetch data from DB.
11. Add API Authentication to App.
12. Build Chat App and Integrating AI powered feature.
