

PARUL UNIVERSITY - Faculty of Engineering and Technology

Department of Computer Science & Engineering

SYLLABUS FOR 6th Sem BTech PROGRAMME

MEA(R)N Stack Web Development

Type of Course: BTech

Prerequisite: Database Management system, SQL, Basics of Javascript and web development

Rationale:

1. Understanding the basics of web development and JavaScript programming
2. Learning how to use MongoDB, a popular NoSQL database, to store and retrieve data
3. Learning how to use Node.js, a server-side JavaScript runtime, to create APIs and handle server-side logic
4. Learning how to use Express.js, a lightweight web application framework for Node.js, to build web applications
5. Learning how to use AngularJS, a powerful front-end JavaScript framework, to create dynamic user interfaces and connect with APIs
6. Building a full-stack web application from scratch using the MEAN stack
7. Understanding best practices for deploying, testing, and maintaining MEAN stack applications

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					Total
Lect Hrs/	Tut Hrs/	Lab Hrs/		External		Internal			
				T	P	T	CE	P	
3	0	0	2	60	-	20	20	-	100

Lect - Lecture, **Tut** - Tutorial, **Lab** - Lab, **T** - Theory, **P** - Practical, **CE** - CE, **T** - Theory, **P** - Practical

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	Introduction to Web Development and the MEAN Stack: Overview of web development, Introduction to the MEAN stack, Setting up the development environment	4%	2
2	MongoDB: Introduction to NoSQL databases, Installation and configuration of MongoDB, CRUD operations in MongoDB, Indexing and querying in MongoDB, Schema design and data modeling	20%	10
3	Node.JS & Express JS: Introduction to Node.js and Express.js, Introduction to Node.js and Express.js, Middleware and routing, Authentication and security with Passport.js, Error handling and logging	20%	10

4	Angular: Introduction to Angular, Setting up an Angular application, Components, modules, and services, Data binding and templates, Forms and validation, Routing and navigation, HTTP and observables, Building a complete frontend for the MEAN stack application	30%	15
5	Integration: Integrating the Angular frontend with the Express.js API, Authentication and user management integration , Handling real-time data with WebSockets, Error handling and testing	10%	5
6	Deployment and Best Practices: Preparing the application for deployment, Hosting and server setup options, Security best practices, Performance optimization and testing, Version control and continuous integration.	6%	3
7	Final Project	10%	5

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

Reference Books:

1. "MEAN Web Development" by Amos Q. Haviv (Publisher: Packt Publishing)
2. "Learning Node.js: A Hands-On Guide to Building Web Applications in JavaScript" by Marc Wandschneider (Publisher: Addison-Wesley Professional)
3. "AngularJS: Up and Running: Enhanced Productivity with Structured Web Apps" by Shyam Seshadri and Brad Green (Publisher: O'Reilly Media)
4. "MongoDB: The Definitive Guide: Powerful and Scalable Data Storage" by Shannon Bradshaw, Kristina Chodorow, and Eoin Brazil (Publisher: O'Reilly Media)

Course Outcome:

After Learning the course, students shall be able to:

1. Have a comprehensive understanding of the technologies and frameworks that make up the MEAN stack, including MongoDB, Express.js, AngularJS, and Node.js.
2. Build full-stack web applications.
3. Understand web development best practices:
4. Work on real-world projects using the MEAN stack. This could include developing a portfolio of projects or contributing to open-source projects.