Guru Nanak Dev Engineering College, Ludhiana
Department of Information Technology
B. Tech (IT) Scheme 2018

Subject Code: PEIT-109
Subject Name: MEAN: Full Stack Web Development

Programme: B.Tech.	**L:** 3 **T: 0 P:** 0
Semester: 6	**Teaching Hours:** 36
Theory/Practical: Theory	**Credits:** 3
Internal Marks: 40	**Percentage of Numerical/Design Problems:** 60%
External Marks: 60	**Duration of End Semester Exam(ESE):** 3 Hours
Total Marks: 100	**Elective Status:** Professional Elective-II

On Completion of the course, the student will have the ability to:

CO#	Course Outcomes
1.	Develop web applications using the concept MEAN stack development.
2.	Create and design web applications using Node.js and Express framework.
3.	Apply the knowledge of AngularJS and MongoDB for web page designing.
4.	Identify, formulate and solve engineering problems in the area of dynamic responsive web applications
5.	Function on multi-disciplinary teams through web application creation

Prerequisites: Web Technologies
Additional Material Allowed in ESE: NIL (Mention anything like graph, calculator etc, if required in exam)

Detailed Contents:

Part-A

Web Development with MEAN full-Stack:
The trend toward full-stack developing, Benefits of full-stack development, Introduction to MEAN: Node.js - The web Server/Platform, Express - The framework, MongoDB - The database, Angular The front-end framework, Supporting Cast : Git for source Control, Bootstrap, Hosting, Example application using MEAN components together, Designing a MEAN stack architecture. [8L]

Building an Express and Node.js Web Application:
Installing Node.js, Introduction and Installation process of NPM, JavaScript and Node.js event-driven programming, JavaScript closures, Node modules, developing Node.js web applications, Installing Express, create first Express application, request and response objects, Implementation the MVC Pattern: horizontal and vertical folder structure, file-naming conventions, configure Express application, Rendering Views, serving static files. [9L]

Part-B

AngularJS and MongoDB:
Installing MongoDB, key features, MongoDB shell, databases, collections and CRUD operations, introduction and understating Mongoose schemas, Key concepts of AngularJS: modules, Two-way data binding, directives, installing AngularJS, Structuring and bootstrapping AngularJS application, MVC entites, routing, services and managing AngularJS authentication. [10L]

Advanced Topics :
Writing a REST API: Rules of REST API, setting up API in Express, Methods to read, add, update and delete data in MongoDB, Call API from Express. Creating Angular application with TypeScript: getting up and running with Angular, Working with Angular components, Building a single-page

application with Angular : Adding navigation, building modular app, binding HTML content, routing parameters, working with forms and handling submitted data. [9L]

Text Books:

1. Simon Holmes and Clive Harber "Getting MEAN with Mongo , Express, Angular and Node" Second Edition, Manning Publications, 2019.
2. Amos Q. Haviv, "MEAN Web Development," Packt Publishing, 2014

Reference Books:

1. Elad Elrom, "Pro MEAN Stack Development", Apress, 2016.
2. Mithun Satheesh, Bruno Joseph D'mello, Jason Krol, "Web Development with MongoDB and NodeJS", Packt Publishing, 2015.

Guru Nanak Dev Engineering College, Ludhiana
Department of Information Technology
B. Tech (IT) Scheme 2018

Subject Code: LPEIT-109
Subject Name: MEAN: Full Stack Web Development Laboratory

Programme: B.Tech.	**L:** 0 **T:** 0 **P:** 2
Semester: 6	**Teaching Hours:** 24
Theory/Practical: Practical	**Credits:** 1
Internal Marks: 30	**Percentage of Numerical/Design Problems:**100%
External Marks: 20	**Duration of End Semester Exam(ESE):**1.5 Hours
Total Marks: 50	**Elective Status:** Professional Elective-II

On Completion of the course, the student will have the ability to:

CO#	Course Outcomes
1.	Deploy and implementation of Express and Node.js web application
2.	Design and construct dynamic front-end with Angular
3.	Develop and build data models with MongoDB and Mongoose.
4.	Recognize, contrive and build solutions for engineering problems in the area of contemporary web applications
5.	Function on diverse teams through web application designing and development

Prerequisites: Web Technologies

Detailed Contents:

1. To install, setup and configure Express, node and npm packages.
2. Create Express project and build static site using Express and Node.
3. Working on the importing Bootstrap option for quick, responsive layouts.
4. To Install of MongoDB and creating a new document/database using CURD Operations like insert, update, read and delete.
5. To building a data model with MongoDB and Mongoose.
6. Connect Express application to MongoDB using Mongoose.
7. To create an angular application and working with its components.
8. To build a single-page application with Angular.
9. To construct a simple login page web application to authenticate users using MEAN stack.

Mini Project: Student has to do a project assigned from course contents in a group of two or three students. The group of students must submit a project report of 8 to 10 pages (approximately) and the team will have to demonstrate as well as have to give a presentation of the same.

Note: It is recommended that mini project allocation to students be done within two-three weeks of the start of the semester. This is only the suggested list of Practical's. Instructor may also frame additional Practical's relevant to the course contents (if required).