GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Integrated MCA 9th Semester
Branch: MCA Integrated
Subject Name: Full Stack Development
Subject Code: 2698602

With effective from academic year 2022-23

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory		Tutorial/ Practical		
L	P	OJT	C	University exams (ESE)	Progressive Assessment (PA)	External Practical /viva Exam(ESE)	Internal evaluation Practical /viva Exam(PA)	
0	4		4	0	0	20	80	100

Pre-requisites:
1. Basics of Javascript
2. Basics of Web Application Development.

Learning Objectives:
1. To get familiar with Full stack development using MongoDB, Express, Angular and Node.
2. Understand various concepts of Full Stack Development.
3. Students learn fast web application development.
4. Application Development in Full Stack.

Course Outcome (COs):
CO1: Understand Full Stack Architecture.
CO2: Able to develop Application using Angular.
CO3: Apply REST APIs in express framework and MongoDB.
CO4: Debug and use Developer Tools to build application using MongoDB, Node.JS, Express and Angular.
CO5: Design and develop application in Full Stack environment.

Practical Guidelines :
- Below list of practical are given as guidelines. Students and mentors can follow given guidelines for their selected application / definition.
- Expected that students will be doing one by one practical implementation on same application in every lab.
- At the end of all practical implementation, it is expected that student is ready with an application developed using MongoDB, Express, AngularJS and NodeJS.

Practical List :

1. Design user interface for a web application using HTML5, CSS3 and Bootstrap.
2. Apply concepts of Javascripts, JQuery and Ajax in your application.
3. Understand Full Stack Application Architecture with MongoDB as Database, ExpressJS as Framework, AngularJS as Web front end framework and NodeJS as Server side platform.
4. Learn to set up environment for Full Stack Development. Install Node, npn, Express Generator which installed globally, Git and Heroku. You must have some command line Interface for giving commands.
5. Learn to create, Extend and publish modules in Node. Modules can be Express Framework, Socket.io, Pug(Jade), MongoDB, Restify and Bluebird.
6. Set up HTTP Webserver in NodeJS

7. Use package.json, environment variables, http modules, file system, events, callback, callback hell, async await, event loop, event emitter, buffer, stream, multer, file system in NodeJS
8. Implement routing, HTTP Methods, middleware, Templating, Form Data, Sessions, redis, Authentication and Cookies in ExpressJS.
9. Setup MongoDB and mongoose Package.
10. Implement CRUD operations in MongoDB.
11. Implementing CRUD operation in Mongoose.
12. Understanding of Angular JS, Use Components of AngularJS.
13. Implement Data Binding, Pipes and Routing in AngularJS.
14. Create Forms in AngularJS.

Evaluation:

Students shall be evaluated on the following components

A	**Internal Evaluation**	**(Internal Assessment- 20)**
	Continuous Progress Evaluation of an Application	20 marks
B	**End –Semester Examination**	**(External Assessment-80 Marks)**
	Implementation of NodeJS in Application	20%
	Implementation of ExpressJS in Application	20%
	Implementation of MongoDB in Application	20%
	Implementation of AngularJS in an Application	20%
	Presentation of Application	20%

Reference Web Resources:

1. https://www.w3schools.com/html/default.asp
2. https://www.w3schools.com/css/default.asp
3. https://www.w3schools.com/bootstrap4/default.asp
4. https://www.tutorialspoint.com/javascript/javascript_quick_guide.htm
5. https://www.tutorialspoint.com/jquery/index.htm
6. https://www.tutorialspoint.com/ajax/
7. https://www.guru99.com/node-js-tutorial.html
8. https://www.tutorialspoint.com/expressjs/expressjs_overview.htm
9. https://www.tutorialspoint.com/nodejs/nodejs_repl_terminal.htm

10. https://www.tutorialspoint.com/expressjs/expressjs_restful_apis.htm
11. https://netcorecloud.com/tutorials/how-to-send-email-with-node-js/
12. https://www.twilio.com/docs/sms/quickstart/node
13. https://tudip.com/blog-post/how-to-send-push-notifications-to-android-devices-in-nodejs/
14. https://socket.io/get-started/chat
15. https://www.section.io/engineering-education/how-to-generate-qr-codes-using-nodejs/
16. https://expressjs.com/en/resources/middleware/cors.html
17. https://www.mongodb.com/docs/manual/
18. https://www.tutorialspoint.com/mongodb/index.htm
19. https://www.section.io/engineering-education/nodejs-mongoosejs-mongodb/
20. https://mongoosejs.com/docs/
21. https://masteringjs.io/tutorials/mongoose/aggregate
22. https://www.c-sharpcorner.com/learn/angular-8-in-10-days
23. https://angular.io/docs

Reference Books:

1. Simon Holmes and Clive Harber “Getting MEAN WITH MONGO, EXPRESS, ANGULAR and NODE” 2nd Edition, Manning Publications, 2019
2. Chris Northwood, "The Full Stack Developer Your Essential Guide to the Everyday Skills Expected of a Modern Full Stack Web Developer", Apress, 2018
3. Vasan Subramanian, "Pro MERN Stack Full Stack Web App Development with Mongo, Express, React, and Node", Apress, 2017
4. Azat Mardan, "Full Stack JavaScript Learn Backbone.js, Node.js and MongoDB" 2nd Edition, Apress, 2015
5. Ethan Brown, "Web Development with Node and Express", O Reilly, 2014