R.V. R. & J.C. COLLEGE OF ENGINEERING *(Autonomous)*,
Chowdavaram, Guntur-19
Department of Computer Science and Business System

Minor Degree
(Full Stack Development)

Subject Code	Subject Name	No.of Hours		
		Lecture	Tutorial	Practical
FSMR1	User Interface Design	3	1	-
FSMR2	Client Side Scripting	2	-	2
FSMR3	React JS	2	-	2
FSMR4	MEAN stack (MongoDB, Express. js, AngularJS, and Node. Js)	2	-	2
FSMR5	C# (.Net Framework)	2	-	2
FSMR6	Web Application Development Using ASP	2		2
FSMR7	J2ME	2	-	2
FSMR8	Modern Application Development (MOOCs)	-	-	-
FSMR9	Advanced Python Programming (MOOCs)	-	-	-

Note: Students who completes C, Python are eligible.

FSMR2: CLIENT SIDE SCRIPTING

Course Objectives:

At the end of the course the students will understand

- The technologies to develop web pages.
- DHTML and event handling mechanism.
- XML, Web Servers and AJAX.
- jQuery, AJAX with jQuery.

Course Outcomes:

After successful completion of the course, the students are able to

- Create web pages using HTML,CSS and Java Script.
- Design dynamic web pages using client side scripting.
- Create XML documents and work with web servers.
- Dive into java script libraries like jQuery.

UNIT-I   **[CO1]**   **(15 Periods)**

Introduction to HTML5: Part - I &Part - II.
Introduction to Cascading Style Sheets (CSS): Part - I &Part - II.
JavaScript: Introduction to Scripting, JavaScript: Control Statements I & II.

UNIT-II   **[CO2]**   **(15 Periods)**

JavaScript: Functions, Arrays, Objects.
Document Object Model (DOM): Objects and Collections, JavaScript Event Handling: A Deeper Look
HTML5: Introduction to canvas – Introduction, canvas coordinate System, Rectangles, Using paths to draw Lines, Drawing Arcs and Circles, Shadows, Quadratic Curves, Bezier Curves, Linear Gradients, Radial Gradients, Images, Image Manipulation, Patterns, Transformations, Text.

UNIT-III   **[CO3]**   **(15 Periods)**

XML–Introduction, Basics, Structuring Data, Namespaces, Document Type Definitions(DTDs), XML Vocabularies, Extensible Style sheet Language and XSL Transformations, DOM.

Web Servers: Introduction, HTTP Transactions, Multitier Application Architecture, Client-side scripting versus Server-side scripting, Accessing Web Servers, XAMPP and IIS Express

Ajax-Enabled Rich Internet Applications with XM and JSON: Introduction, RIAs with Ajax, "Raw" Ajax Example Using the XMLHttpRequest Object, Using XML and the DOM, Creating a Full-Scale Ajax-Enabled Application.

UNIT-IV   **[CO4]**   **(15 Periods)**

Introduction to jQuery, Selecting and filtering, Events, Manipulating content and attributes, Iteration of arrays and objects, CSS and AJAX.

Learning Resources

Text Books:

1. Paul Deitel, Harvey Deitel and Abbey Deitel "Internet & World Wide Web - How to Program", 5/e, Pearson Education.
2. "Web Development with jQuery",Richard York,Wrox-a willy brand.

Reference Books:

1. Jason Cranford Teague "Visual Quick Start Guide CSS, DHTML & AJAX", 4/ e, "Pearson Education".
2. Tom NerinoDoli Smith "JavaScript & AJAX for the Web" Pearson Education, 2007
3. "jQuery Cookbook", jQuery Community Experts,O'REILLY.

Web References:

1. www.deitel.com
2. www.w3schools.com
3. www.tutorialspot.com

FSMR3: ReactJS

Course Objectives:

At the end of the course the students will understand:

- Basics of JavaScript used in React and functional programming with JavaScript.
- Develop applications by using JSX and state management.
- Demonstrate modern web applications by using enhanced components with hooks.
- React Router and leverage its features to handle routing on the client and server.

Course Outcomes:

After successful completion of the course, the students are able to:

- Summarize the ES6 features and implement functional techniques with JavaScript.
- Design and develop React applications with JSX and state management.
- Create modern data driven React web application by using enhanced components with hooks.
- Design and implement client – server applications by using React Router.

UNIT – I   **CO1 (12 Periods)**

Introducing React: Old School Multi-Page Design, New School Single-Page Apps, Meet React - Automatic UI State Management, Lightning-fast DOM Manipulation, APIs to Create Truly Composable UIs, Visuals Defined Entirely in JavaScript, Just the V in an MVC Architecture, React's Past and Future.

JavaScript for React: Declaring Variables, Creating Functions, Compiling JavaScript, Objects and Arrays, Asynchronous JavaScript, Classes, ES6 Modules.

Functional Programming with JavaScript: Imperative versus Declarative, Functional Concepts - Immutability, Pure Functions, Data Transformations, Higher-Order Functions, Recursion, Composition, Putting It All Together.

UNIT – II   **CO2 (12 Periods)**

How React Works: Page Setup, React Elements, ReactDOM, React Components.

React with JSX: React Elements as JSX, Babel, Recipes as JSX, React Fragments, Intro to webpack.

React State Management: Building a Star Rating Component, The useState Hook, Refactoring for Advanced Reusability, State in Component Trees, Building Forms, React Context.

UNIT – III   **CO3 (12 Periods)**

Enhancing Components with Hooks: Introducing useEffect - The Dependency Array, Deep Checking Dependencies, When to useLayoutEffect, Rules to Follow with Hooks, Improving Code with useReducer, useReducer to Handle Complex State, Improving Component Performance, shouldComponentUpdate and PureComponent, When to Refactor.

Incorporating Data: Requesting Data, Render Props, Virtualized Lists, Introducing GraphQL.

Suspense: Error Boundaries, Code Splitting.

UNIT – V   **CO4 (12 Periods)**

React Router: Incorporating the Router, Router Properties, Using Redirects.

React and the Server: Isomorphic Versus Universal, Server Rendering React, Server Rendering with Next.js, Gatsby, React in the Future.

Text Book:

1. Learning React: Modern Patterns for Developing React Apps by Alex Banks and Eve Porcello, 2nd Edition, Published by O'Reilly.

Reference Book:

1. Learning React: A Hands-On Guide to Building Web Applications Using React and Redux by Kirupa Chinnathambi, Second edition, Addison-Wesley Professional.
2. Fullstack React: The Complete Guide to ReactJS and Friends by Anthony Accomazzo, Nate Murray, Ari Lerner, Clay Allsopp, David Gutman, and Tyler McGinnis.

Web References:

1. https://reactjs.org/
2. https://www.geeksforgeeks.org/reactjs-tutorials/
3. www.w3schools.com
4. www.tutorialspot.com

FSMR4(R20)   **MEAN stack**
                    (Mongo DB, Express. js, Angularjs, and Node. js)

Course Objectives:
1. To implement the static, Dynamic webpages using HTML5, CSS3, Bootstrap.
2. To introduce Node.js,Express.js implementation for server side programming
3. Demonstrate database management with Mongo DB.
4. To experiment with single page application development using Angular and to use git version control system.

Course Outcomes:
On completion of the course, the students will be able to:
1. Build a custom website with HTML, CSS, and Bootstrap.
2. Develop the server – side implementation using Node.js,Express.js
3. To make use of database management with Mongo DB drivers for web development.
4. Design a Single Page Application using Angular and establish version control in Github.

Unit-I   **12 Periods**

Introduction: Briefly Full stack web development, Designing MEAN stack Architecture, Differences b/w Canvas and SVG, web Storage, Drag & Drop, Geolocation, Bootstrap-setup, Templates, Typography, Forms & Tables, Navbar, Carousel.

Unit-II   **12 Periods**
Part A:Node.js:- : Getting started with Node, Environment setup, simple server, Modules, Node.js file system module, NPM, Events, Upload the file, Send an Email.
Part B: Express.js:- Introduction, Setup environment, Basic Routing, Middleware, Templating.

Unit-III   **12 Periods**
Mongo DB Drivers: Introduction, MongoDB Installation, Create database, insert, create collection, find, update, drop, CURD Operations, Creating UI, Form validation and user register, Password Encryption, login functionality.

Unit-IV   **12 Periods**
Part A: App development using Angular & AngularJS: Getting Started with Angular, Differences b/w Angular & AngularJS, Components, Properties, Events, Data Binding, AngularJS MVC architecture AngularJS modules, AngularJS Directives, DOM.
Part B: Git & Version control: Getting Started with git, Working with a Local Repository, Working with Remote Repository.

Textbooks(s):	1. Northwood, Chris. The Full Stack Developer: Your Essential Guide to the Everyday Skills Expected of a Modern Full Stack Web Developer. Apress, 2018.
	2. Node.js, MongoDB, and AngularJS Web Development by Brad Dayley Released June 2014 Publisher(s): Addison-Wesley Professional.
References:	1. Beginning MERN Stack: Build and Deploy a Full Stack MongoDB, Express, React, Node.js App Kindle Edition by Greg Lim (Author).
	2. Ihrig CJ, Bretz A. Full stack JavaScript development with MEAN. Site Point; 2014 Dec 24.
Website References:	1. www.w3schools.com
	2. www.javatpoint.com
	3. www.Tutorialpoint.com
	4. git-scm.com
	5. geeksforgeeks
Micro Projects:	1. Develop a Bookstore application by using HTML5, CSS3, jQuery in Github
	2. Develop a shopping cart application by using HTML5, CSS3, jQuery in Github
	3. Design Single page application with different menu items using Angular.
	4. Build a personal portfolio webpage using HTML5, CSS3, jQuery.
	5. Develop a webpage to display solar system using HTML5, CSS3, jQuery
	6. Develop Chess Game using HTML5, CSS, jQuery & Ajax

FSMR5 (R20) C# (.Net Framework) L P C
  (Minor Degree) 3 1 4

Course Objectives:

At the end of the course the students will understand

1. The C# language and Know the object-oriented aspects of C#.
2. Development of windows application development in C#.NET
3. Design and development of web-based applications on .NET (ASP.NET).
4. The use of data bindings with windows and web applications.

Course Outcomes:

At the end of the course, the student will be able to
1. Apply basic concepts of C# programming.
2. Develop and deploy windows applications.
3. Develop and deploy web applications.
4. Develop database driven applications using SQL.

Course Content:
UNIT I **[CO1] 13 Periods**

Introduction to C#
Introducing C#, writing a C# Program, Literals, Data Types, Operators, Expressions, Flow Control, More About Variables, Boxing and unboxing, Debugging and Error Handling.
Object Oriented Aspects of C#
Basic Principles of Object Oriented Programming - Encapsulation, Abstraction, inheritance, polymorphism
Working with Classes and Objects- Access Modifiers, Classes and Class members, Class Objects, Constructors, and Operator Overloading, Working with Namespaces.

UNIT II **[CO2] 13 Periods**

Application Development on .Net
Introduction to Windows form:
- Label, Textbox, Button, Combo Box and List Box Controls, Project.
- Panel, Picture Box, Progress Bar and Timer Controls, Project.
- Checkbox, Radio button and Group box controls, Project.
- Menus, Tree View Control, Project.

UNIT III **[CO3] 13 Periods**

Web Based Application Development on .Net
ASP.NET Essentials:
Introduction to Asp.NET, Benefits of Asp.NET, What's new Asp.NET?
Developing a Web Application:
- Standard Controls-Introduction to standard controls, Label Control, Textbox Control, Button Control, Image Button Control List Box Control, Radio Button Control.

- Navigation Controls-Introduction to Navigation Controls, Site Map Path Controls, Menu Controls, Tree View Controls.
- Validation Controls-Introduction to validation control, Base validator class, required field validator control, range validator control, Regular Expression validator control, Compare validator control, Customvalidator control, Validation summary control.

UNIT IV

ADO.Net & Data Binding   **[CO4] 13 Periods**
Accessing Data using ADO.NET(C#)
What are Databases? Basic SQL Statements, Working with ADO.NET, Overview of ADO.NET Objects Data Grid View Control, Accessing Data using Server Explorer, Creating a new data connection, Accessing data using data adaptors and data sets, Previewing data from data adaptors Connecting to an MS Jet database.
Data Binding(C#)
Introduction, Simple Data Binding, Complex Data Binding, Implementing Data Binding, Project.
Working with Databases (ASP.NET)
ASP.NET data display controls, ASP.NET data source controls, Accessing data with server explorer, Creating a web applications using data display controls.

Text Books:
1. Karli Watson, Christian Nagel, Jacob Hammer Pedersen, Jon Reid, and Morgan Skinner, BEGINNING VISUAL C# 2015, Wiley Publishing, Inc.
2. Vikas Gupta, (2010),"Comdex .NET Programming ", Dream Tech Press, New Delhi.

Reference Books:
1. Stephen C. Perry, Core C# and .NET, Pearson Education, 2006.
2. Herbert Scheldt, C#: The Complete Reference, TATA McGraw Hill Publishing.
3. Andrew Troelsen, Pro C# and the .NET Platform, A! Press.
4. Kevin Hoffman, Microsoft Visual C# 2005 Unleashed, Sams Pearson India.