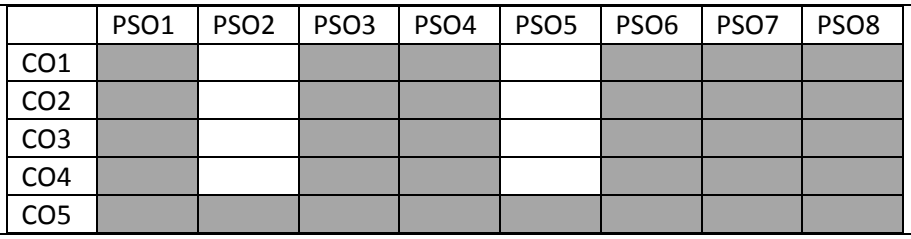
Course: 304: **Full Stack Technology**

Course Code	304
Course Title	**Full Stack Technology**
Credit	4
Teaching per Week	4 Hrs.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Review / Revision	June 2021
Purpose of Course	The purpose of the course is to make the students capable of developing full stack web applications.
Course Objective	The objective of the course is to make student understand full stack development
Course Outcome	CO1 : Understand the syntax, and semantics of the JavaScript programming language. Manipulate DOM elements with the help of JavaScript. CO2: Understand the design of single-page applications and how React facilitates their development. Understand advantages and disadvantages of using React. Understand functional components, state components, parent & child components, lifecycle, hooks, routing, and state management in React. CO3: Understanding the working of Node environment and Express Framework. Understand Server-side Web Application development and Server-side routing. CO4: Understanding Mongo as a data store. Understanding common use-cases and architectures of Mongo. Performing database operations using Mongo's query and update languages. CO5 : Expose the students with the combined development process of the full stack application. Understand connecting React and Node. Understand Github and CI/CD. Understand the deployment of full stack application using Netlify / Heroku.
Mapping between COs with PSOs	
Pre-requisite	HTML, CSS, Front-end Scripting
Course Content	**Unit 1: Introduction** 1.1 JavaScript 1.1.1 Execution Context and Call Stack 1.1.2 Hoisting in JavaScript 1.1.3 Spread Operator 1.1.4 Scope Chain, Temporal Dead Zone 1.1.5 Block Scope, Shadowing 1.1.6 Closures 1.2 Full Stack Technology **Unit 2: React.js** 2.1 React Introduction 2.1.1 What is React 2.1.2 What is a Component 2.1.3 JSX Overview 2.2 create-react-app 2.2.1 Understanding basics of react app 2.3 Understanding virtual DOM, SPA 2.4 Components 2.4.1 Class Components 2.4.2 Functional Components 2.4.3 Parent, Child Components

	2.4.4 Conditional Rendering 2.4.5 State, setState Method 2.4.6 Props 2.5 Event Handling in React 2.5.1 Event Handling in Class Components 2.5.2 Event Handling in Functional Components 2.6 Lifecycle 2.6.1 Class Component Life Cycle Methods 2.7 React Hooks 2.7.1 What is a React Hook 2.7.2 useState Hook 2.7.3 useEffect Hook 2.8 Building forms in React 2.9 React Router 2.10 Controlled vs Uncontrolled Components 2.11 State Management 2.11.1 Single Source of Truth 2.11.2 Lifting State Up 2.11.3 Prop Drilling 2.11.4 useContext 2.11.5 Redux 2.12 HTTP Methods 2.12.1 Fetch 2.12.2 Axios **Unit 3: Node.js & Express.js** 3.1 Introduction to Node.js 3.2 Creating a Simple Server 3.3 Response types - HTML, JSON 3.4 Modules 3.5 NPM 3.6 Introduction to Express.js 3.7 Express Params and Query String 3.8 Express Router **Unit 4: Mongo DB** 4.1 SQL/NoSQL landscape 4.2 Document Vs. Other types of Storage 4.3 MongoDB feature set 4.4 Introduction to BSON and JSON 4.5 Simple Queries 4.6 Connecting with Node JS 4.6.1 Inserts and Retrievals 4.6.2 Updates and Deletes **Unit 5: MERN & Deployment** 5.1 Connecting React and Node 5.2 Building an application in MERN 5.3 Github and CI/CD 5.4 Deploy using Netlify / Heroku
Reference Books	1. Eloquent JavaScript: A Modern Introduction to Programming, No Starch Press 2. You Don`t Know JS, Shroff/O'Reilly 3. The Road to Learn React: Your Journey to Master Plain Yet Pragmatic React.js, Zaccheus Entertainment 4. React Explained: Your Step-by-Step Guide to React, OS Training, LLC 5. Beginning React, Greg Lim

	6. Learning React: Functional Web Development with React and Redux, Shroff/O'Reilly 7. Learn React Hooks: Build and refactor modern React.js applications using Hooks, Packt Publishing Limited 8. Pro React, Apress 9. Web Development with Node and Express: Leveraging the JavaScript Stack, O'Reilly Media 10. Express in Action: Writing, building, and testing Node.js applications, Manning Publications 11. Beginning Node.js, Express & MongoDB Development, Greg Lim 12. MongoDB: The Definitive Guide - Powerful and Scalable Data Storage, Shroff/O'Reilly; Third edition 13. Full-Stack React Projects: Learn MERN stack development by building modern web apps using MongoDB, Express, React, and Node.js, Packt Publishing Limited 14. Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, and Node, Apress
Teaching Methodology	Class work, Discussion, Self-Study, Seminars and/or Assignment
Evaluation Method	30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 70% assessment is based on semester end University External examination