20CS3603 - MREN STACK DEVELOPMENT

**MICRO SYLLABUS**

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| **Course Code** | **20CS3603** | **Year** | III | **Semester** | II |
| **Course**  **Category** | Program Core | **Branch** | CSE | **Course Type** | Theory |
| **Credits** | 3 | **L-T-P** | 3-0-0 | **Prerequisites** | Programming with JAVA |
| **Continuous Internal**  **Evaluation :** | 30 | **Semester End Evaluation:** | 70 | **Total Marks:** | 100 |

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| **Course Outcomes** | | |
| Upon successful completion of the course, the student will be able to | | |
| **CO1** | Understand the fundamental concepts of web application development. | **L2** |
| **CO2** | Apply Node.JS RESFUL APIs to interacting with HTTP services | **L3** |
| **CO3** | Apply Restful JS concepts to build single page application. | **L3** |
| **CO4** | Apply the concepts MangoDB to store and retrieve the data | **L3** |

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| **Course Content** | | |
| **Unit-1** | **Introducing the Node.js-to-Angular Stack**:  Understanding the Basic Web Development Framework, Understanding the Node.js-to-Angular Stack Components, **JavaScript Primer** –  ***Defining Variables, Understanding JavaScript Data Types***,  ***Using Operators***- Arithmetic Operators, Assignment Operators, Applying Comparison and Conditional Operators,  ***Implementing Looping***- while Loops, do/while Loops, for Loops, for/in Loops,  ***Creating Functions***- Defining Functions, Passing Variables to Functions, Returning Values from Functions, Using Anonymous Functions,  ***Understanding Variable Scope***, ***Using JavaScript Objects*** - Using Object Syntax, Creating Custom-Defined Objects,  ***Manipulating Strings*** - Combining Strings, Searching a String for a Substring, Replacing a Word in a String, Splitting a String into an Array,  ***Working with Arrays-*** Combining Arrays, Iterating Through Arrays, Converting an Array into a String, Checking Whether an Array Contains an Item, Adding and Removing Items to Arrays,  ***Adding Error Handling*** - try/catch Blocks, Throw Your Own Errors, Using finally | **CO1** |

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Dr P Sai Kiran -

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| **Unit-2** | **Getting Started with Node.js**:  ***Understanding Node.js*** - Who Uses Node.js?, What Is Node.js Used For?,  ***Installing Node.js*** ***­*-** Looking at the Node.js Install Location, Verify Node.js Executables, Selecting a Node.js IDE,  ***Working with Node Packages*** - What Are Node Packaged Modules?, Understanding the Node Package Registry, Using the Node Package Manager, Searching for Node Package Modules, Installing Node Packaged Modules, Using package.json,  ***Creating a Node.js Application*** - Creating a Node.js Packaged Module, Publishing a Node.js Packaged Module to the NPM Registry, Using a Node.js Packaged Module in a Node.js Application,  ***Writing Data to the Console*** | **CO1,**  **CO2** |
| **UnIt-3** | **Implementing HTTP Services in Node.js**:  ***Processing URLs***- Understanding the URL Object, Resolving the URL Components,  ***Understanding Request, Response, and Server*** ***Objects***- The http.ClientRequest Object, The http.ServerResponse Object, The http.IncomingMessage Object,The http.Server Object ,  ***Implementing HTTP Clients and Servers in Node.js***- Serving Static Files, Implementing Dynamic GET Servers, Implementing POST Servers,  ***Implementing HTTPS Servers and Clients***- Creating an HTTPS Client, Creating an HTTPS Server,  **Implementing Express in Node.js**:  ***Getting Started with Express***- Configuring Express Settings  Starting the Express Server,  ***Configuring Routes***- Implementing Routes, Applying Parameters in Routes,  ***Using Request/Responses Objects-*** Setting Headers, Setting the Status, Sending Response | **CO1,**  **CO2** |
| **Unit-4** | ***How React Works*** - Page Setup, React Elements, ***ReactDOM***-Children, ***React Components***- React Components :A Historical Tour,  ***React with JSX*** - React Elements as JSX, Babel, Recipes as JSX, React Fragments, Intro to webpack-Creating the Project, Loading the Bundle, Source Mapping, Create React App,  **React State Management**  ***Building Forms*** - Using Refs, Controlled Components, Creating Custom Hooks, Adding Colors to State,  **Incorporating Data**  ***Requesting Data***- Sending Data with a Request, Uploading Files with Fetch, Authorized Requests, Saving Data Locally, Handling Promise States, ***Virtualized Lists*** - Creating a Fetch Hook, Creating a Fetch Component, Handling Multiple Requests, Memozing Values,  ***React Router*** - Incorporating the Router, Router Properties-Nesting Parameters, Using Redirects-Routing Parameters. | **CO1,**  **CO3** |

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| **Unit-5** | **Understanding NoSQL and MongoDB**: Why NoSQL?, ***Understanding MongoDB***: Understanding Collections, Understanding Documents, ***MongoDB Data Types***;  **Getting Started with MongoDB and Node.js**: ***Building the MongoDB Environment***- Installing MongoDB, Starting MongoDB, Stopping MongoDB, ***Accessing MongoDB from the Shell Client*** -MongoDB Shell commands and methods**, Adding the MongoDB Driver to Node.js , *Connecting to MongoDB from Node.js*-** Understanding the Write Concern, Connecting to MongoDB from Node.js Using the Mongo Client Object | **CO1,**  **CO4** |

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| **Learning Resources** | |
| **Text Books** | 1. Node.js, MongoDB and Angular Web Development by Brad Dayley, Brendan Dayley, Caleb Dayley, 2nd edition, Perason, ISBN-13: 978-0134655536, ISBN-10: 0134655532 2. Learning React Modern Patterns for Developing React Apps, 2nd Edition, Oreilly, ISBN: 978-1-492-D5172-5 |
| **Reference Books** | 1. Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, and Node by Vasan Subramanian, Apress; 2nd ed. edition (13 May 2019), ISBN-10 ‏ : ‎ 1484243900, ISBN-13 ‏ : ‎ 978-1484243909 2. Mongodb, React, React Native Full-Stack Fundamentals and Beyond, by Eric Bush, Zaccheus Entertainment Publication, ISBN-10 ‏ : ‎ 0997196688, ISBN-13 ‏ : ‎ 978-0997196689  Quick Start Guide: Build web applications with MongoDB, Express.js, React, and Node by Eddy Wilson Iriarte Koroliova, Packt Publishing, ISBN-10: 1787281086, ISBN-13‏: ‎ 978-1787281080Beginning Node.js, Express & MongoDB Development, by Greg Lim (Author), ISBN-10 : 9811480281  1. Beginning Node.js, Basarat Syed, APress, ISBN-10: 9781484201886 |
| **e- Resources & other digital material** | 1. [www.w3schools.com](http://www.w3schools.com/) 2. <https://www.javatpoint.com/mean-stack-tutorial> 3. <https://www.linode.com/docs/guides/mean-stack-tutorial/> |

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