**PRASAD V. POTLURI SIDDHARTHA INSTITUTE OF TECHNOLOGY KANURU, VIJAYAWADA**

**Department of Computer Science and Engineering**

**III B.Tech – II Semester**

**20CS3603 MERN Stack Development**

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| **CO** | **Statement** | **Skill** | **Blooms** | **Units** |
| **CO1** | Understand the fundamental concepts of web application development. | Understand | L2 | 1,2,3,4,5 |
| **CO2** | Apply Node.JS restful APIs to Interact with HTTP services  | Understand, Apply | L2, L3 | 2,3 |
| **CO3** | Apply React JS concepts to build an Application. | Understand, Apply | L2, L3 | 4 |
| **CO4** | Apply the concepts of Mongo DB to manipulate the Database | Understand, Apply | L2, L3 | 5 |

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| **MERN Stack Development Syllabus** |
| **Unit****No.** | **Contents** | **Mapped****CO** |
| **I** | **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, Implementing Looping, Creating Functions, Understanding Variable Scope, Using JavaScript Objects, Manipulating Strings, Working with Arrays, Adding Error Handling | **CO1** |
| **II** | **Getting Started with Node.js**: Understanding Node.js, Installing Node.js, Working with Node Packages, Creating a Node.js Application, Writing Data to the Console | **CO1,****CO2** |
| **III** | **Implementing HTTP Services in Node.js**: Processing URLs, Understanding Request, Response, and Server Objects, Implementing HTTP Clients and Servers in Node.js, Implementing HTTPS Servers and Clients, **Implementing Express in Node.js**: Getting Started with Express, Configuring Routes, Using Request/Responses Objects | **CO1,CO2** |
| **IV** | **How React Works** - Page Setup, React Elements, ReactDOM, React, components, [React with JSX](https://learning.oreilly.com/library/view/learning-react-2nd/9781492051718/ch05.html#react-with-jsx)- React Elements as JSX, [Babel](https://learning.oreilly.com/library/view/learning-react-2nd/9781492051718/ch05.html#babel), Recipes as JSX, React Fragments, Intro to webpack, **React State Management** - Building Forms, **Incorporating Data** - Requesting Data, **Virtualized Lists** - Creating a Fetch Hook, Creating a Fetch Component, Handling Multiple Requests, Memozing Values, React Router. | **CO1,****CO3** |
| **V** | **Understanding NoSQL and MongoDB**: Why NoSQL?, Understanding MongoDB, MongoDB Data Types; **Getting Started with MongoDB and Node.js**: Building the MongoDB Environment, Accessing MongoDB from the Shell Client, MongoDB Shell commands and methods, Adding the MongoDB Driver to Node.js , Connecting to MongoDB from Node.js | **CO1,CO4** |

 **CO-PO Mapping**

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| **Contribution of Course Outcomes towards achievement of Program Outcomes** |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
| **CO1** | √ |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **CO2** | √ |  | √ |  |  |  |  |  | √ | √ |  |  | √ |  |
| **CO3** | √ |  | √ |  |  |  |  |  | √ | √ |  |  | √ |  |
| **CO4** | √ |  | √ |  |  |  |  |  | √ | √ |  |  | √ |  |

**Strength of Correlation**

Distribution of marks weightage to PO’s through CO’s.

* The strength of correlation levels is based on percentage of marks distribution towards PO.

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| --- | --- | --- | --- |
| CIE | **Test** | **Test Number** | **Marks** |
| Objective Exam (10) | Objective Exam -1 | 10 |
| Objective Exam -2 | 10 |
| Assignment (5) | Assignment -1  | 5 |
| Assignment - 2 | 5 |
| Descriptive Exam (15) | Descriptive Exam - 1 | 15 |
| Descriptive Exam - 2 | 15 |

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| **CO** | **Skill** | **Blooms** | **Units** | **Assessing Tools can be used to measure CO (CIE)****Marks** | **Assessing Tools can be used to measure CO (SEE)****Marks** |
| CO1 | Understand | L2 | 1,2,3,4,5 | Objective Exam (20)Descriptive Exam (5)Assignment (2) | 27 |
| CO2 | Apply, Design,Individual Performance, Communication | L3 | 2,3 | Descriptive Exam (15)Assignment (4) | 19 |
| CO3 | Apply, Design,Individual Performance, Communication | L3 | 4 | Descriptive Exam (5)Assignment (2)  | 7 |
| CO4 |  Apply, Design,Individual Performance, Communication | L4 | 5 | Descriptive Exam (5)Assignment (2) | 7 |

**Strength of Correlation**

|  |  |
| --- | --- |
| **% of questions towards PO** | **Level (Weight)** |
| >=20% of total marks | 3 |
| >10% and <20% of total marks | 2 |
| <= 10% of total marks  | 1 |

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| **CO** | **Skill** | **Bloom's** | **Units** | **Assessing tools can be used to measure CO (CIE) Marks** | **Assessing tools can be used to measure CO (SEE) Marks** | **Total (CIE+SEE)** | **Percentage (%)** | **Strength of Correlation** | **PO** |
| **CO1** | Understand | L2 | 1,2,3,4,5 | Objective Exam (20) Descriptive Exam (5)Assignment (2) | 27 | => 27+14 = 41  | 68 | 33 | PO1 |
| **CO2** | Apply, Design,Individual Performance, Communication | L3 | 2,3 | Descriptive Exam (15)Assignment (4) | 19 | => 19 + 24 = 43 | 43% | 3 | PO1PO3PO9PO10PSO1 |
| **CO3** | Apply, Design,Individual Performance, Communication | L3 | 4 | Descriptive Exam (5)Assignment (2)  | 7 | => 7 + 14 | 21% | 3 | PO1PO3PO9PO10PSO1 |
| **CO4** |  Apply, Design,Individual Performance, Communication | L3 | 5 | Descriptive Exam (5)Assignment (2) | 7 | =>7 + 14 | 21% | 3 | PO1PO3PO9PO10PSO1 |

**Course Articulation Matrix:**

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| **Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial, 2: Moderate, 1:Slight)** |
|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| **CO1** | 3 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **CO2** | 3 |  | 3 |  |  |  |  |  | 3 | 3 |  |  | 3 |  |
| **CO3** | 3 |  | 3 |  |  |  |  |  | 3 | 3 |  |  | 3 |  |
| **CO4** | 3 |  | 3 |  |  |  |  |  | 3 | 3 |  |  | 3 |  |
| **Average** | **3** |  | **3** |  |  |  |  |  | **3** | **3** |  |  | **3** |  |

**Course Coordinators Signature Module Coordinators Signature Program Coordinators Signature**

Dr P. Sai Kiran

Mr. B. Vishnu Vardhan Mr. B. Vishnu Vardhan Mrs B. Lakshmi Ramani

Mr. Y. Ayyappa