

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme	Bachelor of Technology				Branch/Spec.	Computer Science & Engineering			
Semester	VI				Version	1.0.0.0			
Effective from Academic Year		2024-25			Effective for the batch Admitted in			June 2022	
Subject code		2CSE611		Subject Name		Web Development using React and NodeJS			
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture (DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	2	0	5	Theory	40	60	100
Hours	3	0	4	0	7	Practical	60	40	100
Pre-requisites:									
Knowledge of Object Oriented Concepts , Database, HTML, CSS, JavaScript.									
Learning Outcomes:									
After Successful completion of the course, students will be able to:									
<ul style="list-style-type: none"> • Understand the web development using React • Understand Node.js architecture and core concepts • Implementation of web application using Node JS and Express JS • To understand how to implement Rest APIs 									
Theory syllabus									
Unit	Content								Hrs
1	Introduction to Node.js Introduction to Node.js-Setting Up a Node.js Environment - Installing Node.js and npm - Creating a basic Node.js server - Handling HTTP requests and responses Programming with Node. Express JS-Configuring Routes-Working with Express Understanding asynchronous JavaScript - Callbacks and Promises - Introduction to async-File System-Read File-Writing a File-Opening a File-Deleting a File-Writing a file asynchronously-Other I/O Operations.								9
2	React Basics and Components Introduction to React and JSX- Overview of React.js - JSX syntax and its advantages- Creating a basic React Component-React Components, Props, and State - Building reusable components - Understanding props and state- Managing component lifecycle-Conditional Rendering and Event Handling - Rendering components conditionally - Handling events in React - State updates and re-renders								9
3	React State Management and Hooks React States and Hooks- Managing state with use State - Exploring various React Advanced React Hooks- Effect hook for side effects - Context API for state management - Custom Hooks-React Routing - Introduction to React Router- Implementing client-side routing - Navigating between components								9
4	Building RESTful APIs with Node.js and Express.js Introduction to RESTful APIs- Understanding REST principles - HTTP methods and status codes - Building API endpoints with Express-Express Middleware and Error Handling - Using middleware in Express- Handling errors in Express applications - Logging and debugging-Building a RESTful API - Designing and implementing API routes - Integrating								9

	MongoDB with Mongoose - Testing APIs with Postman-Database Connectivity-Connecting String-Configuring-Updating Records-Working with Select Command-Deleting Records.	
5	Project and Deployment Building a simple CRUD application-Integrating frontend (React) with backend (Node.js and Express)-Deployment Strategies- Deployment options (e.g., Heroku, Netlify) - Deploying Node.js and React applications	9
Self-Study Topics:		
Enhancing Node performance,Data caching with Redis,Automated Headless Browser Testing,Wiring Up Continuous Integration		
Practical content		
Practicals will be based on Node.js and react		
Mooc Course		
https://www.coursera.org/learn/developing-backend-apps-with-nodejs-and-express		
Text Books		
1	Node.js Design Patterns: Design and implement production-grade Node.js applications using proven patterns and techniques, 3rd Edition	
2	The Road to React: The React.js with Hooks in JavaScript Book (2023 Edition)	
Reference Books		
1	Beginning Node.js, Express & MongoDB Development	
2	Fullstack React: The Complete Book on ReactJS - Full Package	

Course Outcomes:												
COs	Description											
CO1	UnderStand the web development using React											
CO2	Understand Node.js architecture and core concepts											
CO3	Implementation of web application using Node JS and Express JS											
CO4	To understand how to implement Rest APIs											
Mapping of CO and PO:												
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	3	2	2	0	0	3	1	2	1
CO2	3	1	1	2	2	1	0	0	2	1	2	1
CO3	2	2	0	1	2	1	0	0	2	2	2	1
CO4	3	3	1	3	2	2	0	0	3	2	2	1