



Vishnu Waman Thakur Charitable Trust's

# VIVA INSTITUTE OF TECHNOLOGY

(Approved by AICTE, New Delhi, DTE, Govt. of Maharashtra and Affiliated to the University of Mumbai)  
Shirgoan, Kumbharpada, Virar(E), Taluka-Vasai-401305, Phone no:7770002544 Website: www.viva-technology.org

DEPARTMENT OF COMPUTER ENGINEERING

## Academic Year 2024 – 2025 (Odd Sem)

**Course name:** - Mastering Frontend Development: React JS and Next JS with Project Deployment on GitHub/GitLab

**Duration:** - Throughout the semester

**Venue:** - VIVA Institute of Technology

**Co-ordinator:** - Vinal Waghela.

**Enrolled students:** - 60

### Course Objective:-

1. Gain a solid foundation in the core concepts and principles of React JS and Next JS, including component-based architecture, state management, routing, and server-side rendering.
2. Learn to build responsive and dynamic web applications using React JS and Next JS, leveraging modern frontend development techniques and best practices.
3. Acquire hands-on experience in version control and project deployment by learning to effectively use GitHub/GitLab for managing code repositories, collaboration, and continuous integration/continuous deployment (CI/CD) workflows.
4. Develop practical skills by working on real-world projects, applying knowledge to create, test, and deploy fully functional web applications, and understanding the lifecycle of frontend development from initial setup to final deployment.

### Course Outcomes: -

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

1. Demonstrate a comprehensive understanding of React JS and Next JS, including the ability to create and manage components, handle state and props, implement routing, and utilize server-side rendering effectively.
2. Develop and deploy fully functional, responsive web applications using React JS and Next JS, showcasing the ability to translate design concepts into interactive user interfaces.
3. Exhibit proficiency in using GitHub/GitLab for version control, including branching, merging, and collaborating with other developers through pull requests and code reviews.
4. Successfully deploy web applications to live environments using GitHub/GitLab CI/CD pipelines, ensuring smooth and automated deployments and updates.
5. Manage project workflows efficiently, from initial setup to final deployment, including writing clear and concise documentation, maintaining code quality, and following best practices for project organization and management.



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**Course Content:-**

<b>UNITS</b>	<b>TOPICS AND SUB-TOPICS</b>
Unit 1: Introduction to React JS and Next JS	1.1 Overview of React JS: Components, JSX, and Virtual DOM 1.2 Getting Started with Create React App 1.3 Introduction to Next JS: Server-Side Rendering and Static Site Generation 1.4 Setting Up Development Environment
Unit 2: Advanced React JS Concepts	2.1 State Management with React Hooks (useState, useEffect, etc.) 2.2 Context API for State Management 2.3 Advanced Component Patterns: Higher-Order Components, Render Props 2.4 Handling Forms and Events
Unit 3: Building and Routing in Next JS	3.1 Pages and Navigation in Next JS 3.2 Dynamic Routing and Nested Routes 3.3 Data Fetching in Next JS: getStaticProps, getServerSideProps 3.4 API Routes in Next JS
Unit 4: Project Deployment with GitHub/GitLab	4.1 Introduction to Git and Version Control 4.2 Setting Up a Repository on GitHub/GitLab 4.3 Branching, Merging, and Pull Requests 4.4 Continuous Integration and Deployment (CI/CD) Pipelines

**Report:-**

**CO-PO Mapping: -**

Course Outcome	Program Outcome											
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1			3									3
CO2			3									3
CO3					3							3
CO4								2			3	3



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CO5											2	3	3

**CO PO Justification: -**

COs	POs	Justification
CO1	PO3	Strongly mapped as the students will be able to build a multi-page e-commerce application using Next JS's routing and dynamic data fetching.
CO2	PO3	Strongly mapped as the students will be able to build an e-commerce application where the product grid dynamically adjusts to screen size, ensuring a seamless user experience across devices.
CO3	PO3	Slightly mapped as the students will be able to use Git commands like git branch, git merge, and git rebase to maintain a clean and manageable project history.
CO4	PO8	Strongly mapped as the students will be able to implement a CI/CD process that includes approval steps for deployment, ensuring accountability and quality assurance.
	PO11	Moderately mapped as the students will be able to use GitLab's CI/CD tools to automate staging and production deployments, reducing downtime and deployment costs.
CO5	PO10	Strongly mapped as the students will be able to create a README file that outlines project setup, dependencies, and usage instructions, as well as providing API documentation.
	PO11	Strongly mapped as the students will be able to set up a project management board (e.g., on GitHub Projects or Trello) to track tasks, allocate resources, and monitor progress.



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Sunita Naik  
Incharge HOD, Computer Engg.