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A Report on Five-Day Hands-On Skill Development Program on
"MERN Stack from Fundamentals to Industry-Ready Full-Stack Application Development"
Organized by Department of Computer Science & Engineering
In Association with IIC from 03.02.2026 to 07.02.2026.

Report Submitted by: Mr. Anandaraj B, Assistant Professor, Department of Computer Science & Engineering.
Mode of Conduct: Offline
Venue: SRB309
Report Received on 27.02.2026.
Total Participants: 71
Event Overview

Title: "Five-Day Hands-On Skill Development Program on MERN Stack From Fundamentals to Industry-Ready Full-Stack Application Development"

The program commenced at 9:30 AM with a welcome address delivered by **Mr. Anandaraj B, M.Tech., (PhD), Assistant Professor, Department of CSE, MITS**. Then, **Dr. M. Sreedevi, Professor and HoD/CSE**, extended with inagural speech about the program and highlighted the importance of such workshops in building a strong practical foundation in emerging technologies. She encouraged all the students to actively participate, learn new concepts, and explore innovation through hands-on experience. Following this, the session was handed over to **Mr. Neelesh Tiwari,** who guided the participants through engaging, interactive, and practical training program.

Program Objective

The primary objectives of the program were:
- To introduce students to modern full-stack web development practices.
- To provide hands-on experience with the MERN stack ecosystem.
- To bridge the gap between academic curriculum and industry expectations.
- To enable students to develop, test, and deploy real-time applications.
- To improve placement readiness through project-based learning.

Day-Wise Session Topics
Day 1: Foundations of Web Development & MongoDB
Session Topics:
- Introduction to Full-Stack Development
- Understanding Client-Server Architecture
- Introduction to MERN Stack Ecosystem
- JavaScript ES6 Fundamentals
- MongoDB Basics (NoSQL Concepts)
- CRUD Operations in MongoDB
- MongoDB Atlas Setup (Cloud Database)

Hands-On Activities:
- Creating collections and documents
- Performing CRUD operations using MongoDB Shell
- Connecting MongoDB Atlas with local environment

Day 2: Backend Development with Node.js & Express.js
Session Topics:
- Introduction to Node.js Runtime Environment
- Understanding Event Loop and Asynchronous Programming
- Express.js Framework Overview
- RESTful API Design Principles
- Middleware Concept
- Routing and Controllers
- Integration with MongoDB using Mongoose

Hands-On Activities:
- Building REST APIs
- Creating User Authentication APIs
- Testing APIs using Postman
- Error Handling and Validation

Day 3: Frontend Development with React.js
Session Topics:
- Introduction to React.js
- Component-Based Architecture
- JSX and Virtual DOM
- Props and State Management
- React Hooks (useState, useEffect)
- API Integration using Axios
- Conditional Rendering and Forms Handling

Hands-On Activities:
- Creating dynamic UI components
- Connecting frontend with backend APIs
- Implementing Login and Registration Interface

Day 4: Full-Stack Integration & Authentication
Session Topics:
- Connecting React Frontend with Express Backend
- JWT (JSON Web Token) Authentication
- Role-Based Access Control
- Protected Routes
- Environment Variables & Configuration
- Project Folder Structure (Industry Standard)

Hands-On Activities:
- Implementing Login Authentication
- Securing APIs
- Building Dashboard Interface
- Debugging Full-Stack Applications

Day 5: Deployment & Mini Project Development
Session Topics:
- Deployment Concepts (Frontend & Backend)
- Hosting on Vercel / Render / Netlify
- Database Deployment using MongoDB Atlas
- CI/CD Overview
- Resume Optimization with Projects
- Interview Preparation Guidance

Capstone Mini Project:

Students developed a Full-Stack Web Application, such as:

- Student Management System
- Placement Tracker
- Task Management App
- Mentor-Mentee Interaction Portal

Final Program Outcome

By the end of the program, the participants were able to:

- Design and develop full-stack applications independently.
- Create RESTful APIs using Express.js.
- Build responsive front-end interfaces using React.
- Implement authentication using JWT.
- Deploy applications to cloud platforms.
- Demonstrate project experience suitable for campus placements.

The program ended with a Vote of Thanks delivered by **Mrs. P. Jayaselvi M.E.,(PhD).**, expressing gratitude to the resource person, participants, Head of the Department, Principal, and Management for their support and for making the event a grand success.