School of Engineering & Technology

Department of Mechanical Engineering

Academic Year 2024-25

Expert Lecture on

Introduction to PLC and SCADA

Delivered By

Mr. Harshal Chaughule

Date:	11th March 2025
Venue:	Department of Mechanical Engineering
Expert Speaker:	Mr. Harshal Chaughule, Assistant Professor, EEED, SOET, Sandip University, Nashik

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Introduction

The Department of Mechanical Engineering organized an expert lecture on "Introduction to PLC and SCADA" on 11th March 2025. The session was delivered by Mr. Harshal Chaughule, an esteemed Assistant Professor from the Electrical and Electronics Engineering Department (EEED) at the School of Engineering and Technology (SOET), Sandip University, Nashik. The primary objective of this lecture was to familiarize students with the fundamental concepts of Programmable Logic Controllers (PLC) and Supervisory Control and Data Acquisition (SCADA), which play a critical role in modern industrial automation.

The event was attended by faculty members and students from various engineering disciplines, who showed keen interest in learning about industrial automation systems and their practical applications. The lecture served as an opportunity for students to bridge the gap between theoretical learning and real-world industrial processes.

Overview of the Lecture

Mr. Harshal Chaughule commenced the session by introducing the students to the significance of industrial automation and its applications in various sectors such as manufacturing, process industries, power plants, and utilities. The session was structured into two key segments:

1. Introduction to PLC

- Definition and Importance of PLC in automation
- Evolution of PLCs from relay-based control systems to modern digital controllers
- Architecture and working principle of PLC
- Programming languages used in PLC (Ladder Logic, Functional Block Diagram, Structured Text, etc.)
- Real-world applications of PLC in industrial automation
- Advantages of PLCs over traditional relay-based control systems
- Demonstration of PLC programming using simulation software

2. Introduction to SCADA

- Definition and role of SCADA in industrial automation
- Components of SCADA: Remote Terminal Units (RTUs), Master Terminal Units (MTUs), and Human-Machine Interface (HMI)
- Communication protocols used in SCADA (Modbus, Profibus, Ethernet/IP, etc.)
- SCADA architecture and data flow in industrial monitoring systems
- Application of SCADA in monitoring and controlling industrial processes such as water treatment plants, power grids, and manufacturing units
- Case studies showcasing SCADA implementation in industries

Interactive Session and Demonstration

The lecture was highly interactive, with students actively participating and asking insightful questions. Mr. Chaughule conducted a live demonstration showcasing the interfacing of PLC with SCADA, allowing students to understand real-time data acquisition, process control, and remote monitoring. He explained how industries leverage these technologies to optimize production efficiency, ensure safety, and improve operational reliability.

During the hands-on session, students were introduced to PLC simulation software and learned how to design basic control logic. They were also given an overview of SCADA visualization tools, which are used for monitoring and controlling industrial processes in real time.

Furthermore, Mr. Chaughule discussed various challenges faced in industrial automation and how emerging technologies like IoT and Artificial Intelligence are enhancing the efficiency of PLC and SCADA systems.

Key Takeaways

- Fundamental understanding of PLC architecture, programming languages, and industrial applications
- Insight into SCADA systems, their components, and operational significance
- Exposure to real-world case studies and live demonstrations
- Knowledge of the latest trends in industrial automation, including IoT integration with PLC and SCADA
- Awareness of career opportunities in industrial automation, control systems, and process optimization

Conclusion

The expert lecture on "Introduction to PLC and SCADA" provided an in-depth understanding of the core concepts of industrial automation. The session was well-received by students and faculty members, as it bridged the gap between theoretical knowledge and practical applications. Many students expressed their enthusiasm to explore automation technologies further and work on related projects.

The Department of Mechanical Engineering extends its gratitude to Mr. Harshal Chaughule for sharing his expertise and inspiring students. His practical insights and engaging presentation made the session highly informative and beneficial for all attendees. The department looks forward to organizing more such knowledge-sharing sessions in the future to keep students updated with the latest advancements in engineering and automation.

Glimpses of the Event-


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