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Directorate General Resettlement (DGR) Courses for JCOs / OR and Equivalent Ranks Training Year: 2026- 27

Industrial Automation: Managing Smart Factories

Duration: 12 Weeks

Basic Qualification Required:
Diploma in Mechanical/ Electrical/ Electronics/ equivalent

Batch 1: 24-Aug-26 to 13-Nov-26
Batch 2: 23-Feb-27 to 15-May-27

Training Venue: CEMS, Visakhapatnam

Industrial Automation: Managing Smart Factories

Course Overview:

This course is designed to provide comprehensive knowledge and skills in the field of industrial automation, focusing on the management of smart factories. Participants will learn about various automation technologies, including PLC (Programmable Logic Controller) systems, SCADA (Supervisory Control and Data Acquisition), Robotics, IIoT (Industrial Internet of Things), and AI (Artificial Intelligence) applications in industrial settings. Emphasis will be placed on understanding the integration of these technologies to optimize manufacturing processes, enhance productivity, and ensure operational efficiency in smart factories.

Course Outcome:

Upon completion of the course, participants will be equipped with the knowledge and skills to:

- ▶ Design and implement automation solutions for industrial processes.
- ▶ Integrate various automation technologies to create smart factory environments.
- ▶ Analyze data generated by automation systems to improve efficiency and productivity.
- ▶ Implement predictive maintenance strategies to minimize downtime.
- ▶ Manage and optimize smart factory operations effectively.

Career Opportunities in India:

- ▶ Automation Engineer
- ▶ Industrial Automation Specialist
- ▶ SCADA Engineer
- ▶ PLC Programmer
- ▶ Robotics Engineer
- ▶ IIoT Solutions Architect
- ▶ Manufacturing Automation Consultant
- ▶ Smart Factory Manager

Industry Applications:

The knowledge and skills acquired in this course are applicable across various industries, including:

- ▶ Automotive Manufacturing
- ▶ Pharmaceutical Production
- ▶ Food and Beverage Processing
- ▶ Chemical Plants
- ▶ Electronics Manufacturing
- ▶ Textile Industry
- ▶ Oil and Gas Refineries
- ▶ Renewable Energy Production

Future Scope:

- ▶ With the rapid advancement of automation technologies and the growing adoption of Industry 4.0 principles, the demand for professionals skilled in managing smart factories is expected to increase.
- ▶ Opportunities for specialization in areas such as AI, Machine Learning, and cybersecurity within the field of industrial automation are likely to expand.
- ▶ Continued innovation in robotics and IoT will open up new possibilities for enhancing efficiency and productivity in manufacturing.
- ▶ Professionals with expertise in industrial automation will play a crucial role in shaping the future of manufacturing by driving innovation and optimizing processes.

Month 1: Fundamentals of Industrial Automation

Week 1-2: Introduction to Industrial Automation

- ▶ Understanding the basics of industrial automation
- ▶ Introduction to smart factories and Industry 4.0
- ▶ Overview of automation components: PLCs, HMIs, SCADA systems, sensors, actuators, etc.
- ▶ Case studies on the successful implementation of automation in industries

Week 3-4: PLC Programming

- ▶ Basics of PLC (Programmable Logic Controller) programming
- ▶ Hands-on exercises on ladder logic programming
- ▶ Understanding PLC hardware and software components
- ▶ Simulation of PLC programs for various industrial processes management, etc.



Month 2: Management of Smart Factories / Network Integration

Week 1-2: Human-Machine Interface (HMI) and SCADA Systems

- Introduction to HMIs and SCADA systems
- Designing user-friendly HMIs for industrial applications
- Configuring SCADA systems for data acquisition and control
- Integration of PLCs, HMIs, and SCADA for effective automation

Week 3-4: Industrial Networking and Communication Protocols

- Basics of industrial networking: Ethernet/IP, Profinet, Modbus, etc.
- Configuring networked automation systems
- Troubleshooting and maintenance of industrial networks
- Cybersecurity considerations in industrial automation

Month 3: Advanced Automation Technologies

Week 1-2: Robotics and Automated Systems

- Introduction to industrial robots and their applications
- Programming robots for automation tasks
- Integration of robots with PLCs and HMIs
- Hands-on experience with robotic arms and automated systems

Week 3-4: Advanced Topics in Industrial Automation

- Machine vision systems and their role in automation
- Predictive maintenance and condition monitoring
- Big data analytics for optimizing industrial processes
- Emerging trends in industrial automation: AI, IoT, cloud computing

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