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Course Name

Advanced Human-Machine Interface (HMI) Design

Sector Name

Instrumentation & Controls

Document Type

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Advanced Human-Machine Interface (HMI) Design

Course Introduction

This course provides an in-depth understanding of Advanced Human-Machine Interface (HMI) Design, focusing on best practices for creating user-friendly, efficient, and visually effective interfaces in industrial automation systems. Participants will learn how to design HMIs that improve operator efficiency, reduce human error, and enhance situational awareness.

The course covers modern HMI trends, usability principles, graphical best practices, security considerations, and real-world implementation strategies.

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Advanced Human-Machine Interface (HMI) Design

Target Audience

✓ HMI designers and developers in industrial automation
✓ Control engineers are optimizing user interfaces for operators
✓ SCADA and PLC programmers integrating HMI systems
✓ Industrial UX/UI designers improving usability and efficiency
✓ Cybersecurity professionals securing HMI networks
✓ Process engineers enhancing operator situational awareness

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Learning Objectives

- ✓ Understand HMI fundamentals and their role in industrial automation.
- ✓ Learn ergonomic and usability principles for effective HMI design.
- ✓ Apply modern design trends, including high-performance graphics and situational awareness techniques.
- ✓ Optimize HMI screen navigation and alarm management for better operator response.
- ✓ Implement secure and reliable HMI systems with cybersecurity considerations.
- ✓ Integrate HMI with PLCs, SCADA, and Industrial IoT (IIoT) platforms.
- ✓ Design mobile and remote HMIs for enhanced accessibility.
- ✓ Use HMI development software tools for real-world applications.

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Course Outline

✓ 01 Day One

Module 1: Introduction to Human-Machine Interfaces (HMI)

- ✓ The role of HMI in industrial automation
- ✓ Evolution of HMI from basic panels to advanced touchscreen interfaces
- ✓ Key components of HMI systems (hardware and software)

Module 2: Usability and Ergonomic Principles in HMI Design

- ✓ Best practices for intuitive user interfaces
- ✓ Color theory and contrast for readability and visibility
- ✓ Button placement and screen hierarchy for operator efficiency

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Course Outline

✓ 02 Day Two

Module 3: High-Performance HMI Design

- ✓ The difference between traditional vs. modern HMIs
- ✓ Designing for situational awareness and minimal distraction
- ✓ Graphical best practices – avoiding clutter, excessive animations, and unnecessary details

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Course Outline

✓ 03 Day Three

Module 4: HMI Navigation and Alarm Management

- ✓ Designing clear and structured navigation menus
- ✓ Alarm rationalization and prioritization for better decision-making
- ✓ Best practices for displaying real-time and historical data

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Advanced Human-Machine Interface (HMI) Design

Course Outline

✓ 04 Day Four

Module 5: Security and Reliability in HMI Systems

- ✓ Cybersecurity risks in HMI design and how to mitigate them
- ✓ Role-based access control and user authentication strategies
- ✓ Network security considerations when connecting HMIs to SCADA and IIoT

Module 6: Integration with Industrial Control Systems

- ✓ Connecting HMIs with PLCs, SCADA, and MES
- ✓ Industrial communication protocols (Modbus, OPC UA, Ethernet/IP, PROFINET)
- ✓ Data logging, reporting, and cloud connectivity for IIoT

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Course Outline

✓ 05 Day Five

Module 7: Mobile and Web-Based HMI Solutions

- ✓ Designing responsive HMI interfaces for mobile devices
- ✓ Cloud-based HMIs and remote monitoring solutions
- ✓ Challenges and best practices for mobile industrial applications

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Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
June 27, 2027	July 1, 2027	5 days	4250.00 $	KSA , Jeddah
Sept. 6, 2027	Sept. 10, 2027	5 days	4950.00 $	England , London
Dec. 7, 2026	Dec. 11, 2026	5 days	4250.00 $	UAE , Dubai
March 15, 2027	March 19, 2027	5 days	4250.00 $	UAE , Dubai

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