Industrial Automation Track

Comprehensive Understanding & Simulation Skills

Agnes

Phase 1 (Month 1): Automation & PLC Fundamentals

(Online)

Automation Systems & Sensors

- **Foundation of Control:** Explore the principles of modern industrial automation systems, which integrate cutting-edge solutions to enhance productivity and efficiency.

- **Role of Sensors:** Understand how sensors act as the 'eyes and ears' of an automation system, providing critical data for monitoring and decision-making.

Actuators, Motors & Control

- **Driving Action:** Learn about actuators and motors—components that execute commands and perform physical work, including robotic applications for improved accuracy.

- **Core Principles:** Dive into basic control theory, grasping the concepts that govern how automation systems regulate outputs to ensure stable and precise operations.

PLC Programming & Data

- **PLC Core:** Master the fundamentals of PLCs, the 'brains' of industrial operations that monitor and control complex data to ensure safety and efficiency.

- **Programming & Application:** Gain practical skills in PLC programming and data manipulation, essential for configuring systems and managing operational information.

Phase 1 (Month 2): HMI, Networks & Emerging Tech

Integrating Visualization, Connectivity, and Intelligence

HMI & SCADA Concepts

Visualization & Control: Develop intuitive HMI for clear visualization and efficient operator control.

System Oversight: Explore SCADA systems for monitoring complex processes, ensuring safety and optimizing operations.

Intuitive Interfaces **Real-time Data** **System Safety**

Industrial Network Protocols

⇄ **Connectivity Backbone:** Master protocols like PROFINET & Modbus TCP/IP, the backbone for seamless communication between PLCs, HMIs, sensors, and actuators.

🛡 **Reliable Data Exchange:** Understand the principles governing secure and reliable data transfer, forming the communication foundation for integrated automation.

Seamless Communication **Data Integrity** **System Integration**

Robotics & Machine Vision

Industrial IoT (IIoT) & Scoping

Phase 2 (Month 3): Capstone Project Immersion

Offline Application & Integration: Building an Automated Assembly Line

🏭 Automated Line Design & PLC Core

Strategic Blueprint: Design comprehensive assembly lines, integrating cutting-edge solutions to enhance productivity and define operational sequences.

PLC as the Brain: Architect the PLC structure, the central decision-maker, to monitor and control complex data, ensuring safety and efficiency.

[System Integration] [Control Logic]

🔗 Advanced Control & Interfacing

Complex Logic Development: Master advanced PLC programming, including state machines and sophisticated data handling for precise process control.

Intuitive HMI & Communication: Develop clear HMIs for efficient control and establish robust communication protocols for integrated system performance.

🦾 Robotic & Vision Systems

Intelligent Automation: Integrate industrial robots for accuracy and speed. Implement machine vision for quality control and precision guidance.

System Refinement: Develop expertise in systematic troubleshooting and apply optimization techniques to fine-tune system performance for maximum efficiency.

[Precision Movement] [Quality Assurance]

Program Culmination & Career Readiness

Final Project Showcase

Demonstrating Mastery: Present capstone projects integrating PLC, HMI, robotics, and IIoT into a functional solution.

Comprehensive Deliverables: Meticulous documentation of project design, implementation, and results, validating technical understanding.

Technical Proficiency   **Problem Solving**

Analytical Reporting

Career & Professional Growth

Enhancing Employability: Workshops on resume building, interview techniques, and personal branding for the competitive job market.

Strategic Connections: Network with industry experts and potential employers to foster career-advancing relationships.

Industry Readiness   **Professional Skills**

Networking

Recognition & Future Readiness

Formal Achievement: A graduation ceremony celebrating the successful completion of rigorous automation training.

Industry-Recognized Certification: Receive certification affirming specialized skills and enhancing professional credentials.

Academic Success   **Skill Validation**

Career Launch