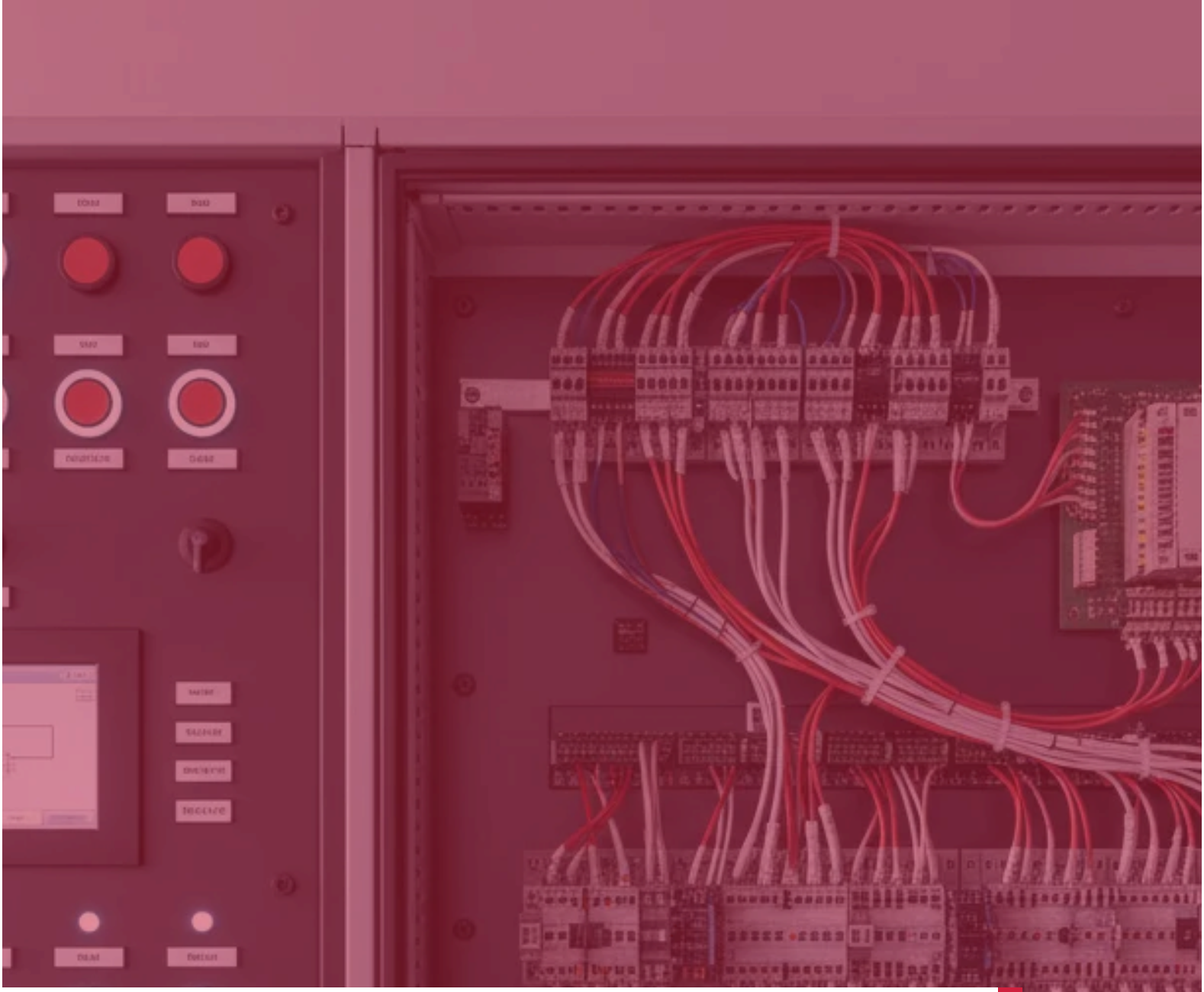


Máster online 100%

Master in Industrial Automation Engineering and Industry 4.0 + 60 ECTS Credits

Structuralia

Máster online 100%

Master in Industrial Automation Engineering and Industry 4.0 + 60 ECTS Credits

Modality
Online

Languages
Español

Duration
1500 hours (60 ECTS)

No Limit
AI Assistant

Does it include practices?
NO

Educational Institutions

Structuralia Engineering eLearning

Universidad Nebrija

Summary

The Master in Industrial Automation Engineering and Industry 4.0 is an advanced specialization program designed for professionals in the industrial sector who seek to update and enhance their skills in critical and emerging areas. You will access rigorous and updated training, consolidating your expertise in industrial electricity, programmable automation and predictive and corrective industrial maintenance. This program provides you with specialized strategic and technical knowledge, allowing you to master the assembly and assembly techniques of cutting-edge electrical and electronic equipment, the advanced interpretation of connection diagrams and guides under current regulations, and the comprehensive management of complex air conditioning systems. With an eminently practical approach, you will acquire the ability to address the complex challenges of industrial automation, from design to implementation. You will develop mastery in the identification of key elements and equipment, as well as in connection and connectorization techniques, fundamental for operability, safety and energy efficiency. You will strengthen your professional profile, preparing you to lead the optimization of processes, the implementation of innovative projects and the management of multidisciplinary teams. With this master's degree, you will not only update your technical knowledge, but you will transform your decision-making and management

capacity in the field of engineering, positively impacting your professional career and the efficiency of industrial operations.

Agenda

MODULE 1. INDUSTRIAL ELECTRICITY

1. DIDACTIC UNIT 1. ELEMENTS AND EQUIPMENT USED IN INDUSTRIAL AUTOMATION SYSTEMS

1. Structure of an automatic system: power network, electrical cabinets, command and control desks, wiring, sensors, actuators, among others
2. Technologies applied in automation: wired logic and programmed logic
3. Types of process controls: open loop or closed loop
4. Types of applicable industrial processes
5. Electrical switchgear: contactors, switches, relays, among others
6. Detectors and sensors
7. Field instrumentation: pressure, flow, level and temperature measuring instruments
8. Control equipment: analog regulators and digital regulators
9. Actuators: starters, drives, regulation and control valves, motors, among others
10. Cables and conduction systems: types and characteristics
11. Electrical safety elements and equipment. Standardized symbology
12. Pneumatic elements: air production and treatment, distributors, valves, pressure switches, cylinders, pneumatic motors, vacuum, among others
13. Hydraulic elements: hydraulic group, distributors, hydrovalves, servovalves, pressure switches, cylinders, hydraulic motors, accumulators, among others
14. Electropneumatic and electrohydraulic devices
15. Standardized symbology

2. DIDACTIC UNIT 2. ASSEMBLY AND ASSEMBLY TECHNIQUES OF ELECTRICAL AND ELECTRONIC EQUIPMENT

1. Schemes and technical documentation
2. Tools for assembly
3. Assembly phases and sequences
4. Location and collection of elements and components
5. Component assembly procedures
6. Fixing and holding techniques
7. Protective equipment
8. Safety and environmental standards
9. Reporting

3. DIDACTIC UNIT 3. ELEMENTS, TOOLS AND EQUIPMENT FOR CONNECTION OF ELECTRICAL AND ELECTRONIC EQUIPMENT

1. Elements and components of electrical or electronic equipment
2. Connectors and terminals: Types, characteristics and applications. Normalization
3. Cables. Types and characteristics. Normalization
4. Electrical and manual tools for connection and connectorization
5. Auxiliary materials. Fixing and labeling elements: flanges, twist locks, cable gland elements, clamps, tapes, etc.
6. Welding. Types
7. Protective and safety equipment
8. Safety regulations

9. Environmental standards

4. DIDACTIC UNIT 4. INTERPRETATION OF SCHEMES AND CONNECTION GUIDES FOR ELECTRICAL AND ELECTRONIC EQUIPMENT

1. Connector and terminal symbols
2. Interpretation of electrical and electronic diagrams
3. Interpretation of assembly and assembly manuals
4. Cable and conductor coding
5. Cables, terminals and connectors associated with electrical equipment
6. Cables, terminals and connectors associated with electronic equipment
7. Connection diagrams and guides
8. Connectorization diagrams and guides

5. DIDACTIC UNIT 5. CONNECTION AND CONNECTORIZATION TECHNIQUES OF ELECTRICAL AND ELECTRONIC EQUIPMENT

1. Assembly guides and plans
2. Cable conditioning
3. Connection techniques
4. Welding. Types and techniques
5. Connectorizing techniques
6. Fixation techniques
7. Labeling techniques
8. Verification procedures
9. Reporting
10. Safety regulations
11. Environmental standards

6. DIDACTIC UNIT 6. PREVENTIVE MAINTENANCE TECHNIQUES FOR ELECTRICAL AND ELECTRONIC ELEMENTS AND EQUIPMENT OF INDUSTRIAL AUTOMATION SYSTEMS

1. Analysis of electrical and electronic equipment and elements of industrial automation systems
2. Predictive maintenance
3. Preventive maintenance: Established procedures
4. Replacement of elements based on their half-life
5. Preventive maintenance of cabinets and control and control panels
6. Preventive maintenance of field instrumentation: instruments for measuring pressure, flow, level and temperature, among others
7. Preventive maintenance of control equipment: analog regulators and digital regulators
8. Preventive maintenance of actuators: starters, drives, regulation and control valves, motors
9. Electrical safety elements and equipment
10. Interpretation of plans and diagrams
11. Standardized symbology
12. Protocol completion

7. DIDACTIC UNIT 7. PROCEDURES FOR SUPERVISION OF THE ASSEMBLY OF INDUSTRIAL AUTOMATION SYSTEMS

1. Specification of the technical characteristics of the enclosures, degree of protection and grounding
2. Construction techniques and verification of paintings, cabinets and desks. Interpretation of plans

3. Determination of the phases of construction of enclosures: selection, layout, machining, distribution and marking of elements and equipment, wiring and marking, final checks, waste treatment
4. Cables and cable management systems
5. field elements
6. Supervision of control elements
7. Interpretation of plans
8. Selection and handling of tools and equipment

8. DIDACTIC UNIT 8. TECHNIQUES FOR COMMISSIONING PROTOCOLS OF INDUSTRIAL AUTOMATION SYSTEMS

1. Start-up protocols
2. Cold start
3. Hot start-up
4. Operating parameters in the facilities: Adjustments and calibrations
5. Setup
6. Measurement instruments and procedures
7. Regulatory tests (tightness, leaks, pressure, among others)
8. Safety measures in the insulation and connections of machines and equipment

9. DIDACTIC UNIT 9. START-UP TECHNIQUES

1. Measurement of variables (electrical, pressure, temperature, among others)
2. Programmable equipment control programs
3. Regulation according to specifications
4. Modification, adjustment and verification of installation parameters
5. Adjustment and verification of installed equipment
6. Techniques for checking the protection and insulation of pipes and accessories
7. Tightness, pressure and mechanical resistance tests
8. Cleaning and disinfection of circuits and facilities
9. Industrial signage
10. Marking of hydraulic and electrical conduits
11. Color code
12. Parameter measurements: Procedures. Instruments
13. Adjustment, regulation and control parameters in industrial automation systems
14. Control and regulation systems
15. Measurements of temperature, pressure, among others
16. Harmful factors and their treatment: Dilations. Vibrations. Discharges
17. Alarms

10. DIDACTIC UNIT 10. BASIC CONCEPTS ON SAFETY AND HEALTH AT WORK

1. Work and health
2. Professional risks
3. Risk factors
4. Consequences and damages derived from work
5. Basic regulatory framework regarding occupational risk prevention
6. Public organizations related to occupational health and safety

11. DIDACTIC UNIT 11. ELECTRICAL RISKS

1. Types of electrical accidents

2. direct contacts
3. Protection against direct contact
4. indirect contacts
5. Safety regulations

MODULE 2. ELEMENTS AND MECHANISMS OF INDUSTRIAL MACHINES

1. DIDACTIC UNIT 1. INTERPRETATION OF DRAWINGS OF INDUSTRIAL MACHINE ELEMENTS

1. Orthogonal and isometric representation
2. View rendering systems
3. Cuts and sections
4. Dimensioning rules
5. Assembly drawings, exploded drawings and lists of materials
6. Fitting systems, tolerances and surface signs
7. Threaded, welded, riveted, pin and bolt joints: Types. Characteristics. Representation and standards
8. Manual sketching of parts
9. Drawing rules
10. Graphic interpretation of mechanical elements and pneumatic and hydraulic circuits

2. DIDACTIC UNIT 2. KNOWLEDGE OF MATERIALS OF INDUSTRIAL MACHINE ELEMENTS

1. General properties
2. Carbon and alloy steels and cast irons
3. Non-metallic materials
4. Heat treatments: Annealing. Normalized. Temper. Tempered. Cemented. etc

3. DIDACTIC UNIT 3. AXLES, SUPPORTS, COUPLINGS AND ACCESSORIES

1. Trees and axes: Form. Characteristics. Applications
2. Sliding friction rotary bearings: Types. Material. Settings. Lubrication
3. Linear sliding carriages with guides, plates, columns, bushings, among others
4. Rotary and linear bearings: Types. Application. Assembly provisions. Settings. Lubrication
5. Sealing gaskets for bearings and shafts: Types. Features
6. Unions for cubes: Keys, tongues, cones, among others
7. Couplings
8. Clutches
9. Brakes. Tires. Electromagnetic
10. Elastic springs: Types. Material. Characteristics. Applications

4. DIDACTIC UNIT 4. MOTION TRANSMITTERS

1. Belt transmission: Types. Characteristics. Applications
2. Chain transmission: Types. Characteristics. Applications
3. Gear transmission: Types. Characteristics. Applications
4. Gear trains. Speed reducers. Gearboxes. Differential gear mechanisms
5. Ratchet mechanism
6. Eccentric or cam mechanisms
7. Connecting rod-crank mechanism
8. Rack-pinion mechanism

9. Screw-nut mechanism by sliding or rolling

5. DIDACTIC UNIT 5. CALCULATION OF BASIC MECHANICAL QUANTITIES

1. Transmission ratio
2. Linear and angular speed
3. Starting power required on the engine
4. Friction, acceleration, starting, braking or damping forces and torques
5. Relationship between parameters: Par. Power. Speed

6. DIDACTIC UNIT 6. PNEUMATIC-HYDRAULIC AUTOMATIONS

1. Calculations: Units. Characteristics. Laws
2. Fluids: Types. Features
3. Actuators: Linear. Rotating. Limited turn
4. Directional valves
5. Lock valves
6. Flow valves
7. Pressure valves
8. Drive groups: Pumps. Deposits. Filters. Accessories
9. Pipes. Connections. Couplings. Flanges
10. Sealing joints: Types. Features

MODULE 3. PROGRAMMABLE PLANTS

1. DIDACTIC UNIT 1. INTRODUCTION TO INDUSTRIAL AUTOMATION

1. Previous concepts
2. Automation objectives
3. Degrees of automation
4. Automation classes
5. Equipment for industrial automation

2. DIDACTIC UNIT 2. INTRODUCTION TO PROGRAMMABLE CONTROLLERS

1. History and evolution of programmable controllers
2. Advantages and disadvantages of the PLC compared to wired logic
3. Classification of automata
4. Functioning and essential blocks of programmable controllers
5. Operation of programmable controllers
6. Power supply
7. central processing unit; CPU
8. PLC memory
9. Input and output interface

3. DIDACTIC UNIT 3. OPERATING CYCLE OF THE AUTOMATION

1. Modes of operation
2. Operating cycle
3. System checks
4. Runtime and real-time control
5. Fast Process Elements

4. DIDACTIC UNIT 4. PLC CONFIGURATION

1. Types of processors in the Central Processing Unit
2. Control Unit Configuration
3. Central Multiprocessors
4. Peripheral Processors
5. Redundant control units
6. Input/output system configurations
7. Centralized Inputs/Outputs
8. Distributed Inputs/Outputs
9. Mass memory

5. DIDACTIC UNIT 5. PLC PROGRAMMING: GENERAL CONCEPTS AND BOOLE ALGEBRA

1. General programming concepts
2. Application program structures and execution cycle
3. Representation of programming languages and the IEC 61131-3 standard
4. Boolean algebra
5. Fundamental postulates of Boolean Algebra applied to electrical contacts
6. Morgan's theorems

6. DIDACTIC UNIT 6. PLC PROGRAMMING: LANGUAGE ON THE LEVEL OF FUNCTIONS

1. Function plane language
2. Logic Gates or Fundamental Functions
3. Special features
4. Example solved using function plane

7. DIDACTIC UNIT 7. PLC PROGRAMMING: LANGUAGE IN CONTACT SCHEMES

1. Language in contact schemes
2. Language rules
3. Language elements
4. Example solved using a ladder diagram

8. DIDACTIC UNIT 8. PLC PROGRAMMING: LANGUAGE IN INSTRUCTION LIST

1. Instruction List Language
2. Structure of a command instruction
3. Examples of control instructions for different brands of PLC's
4. Instructions in instruction list

9. DIDACTIC UNIT 9. PLC PROGRAMMING: GRAFCET

1. Grafcet
2. Basic Principles
3. Grafcet structures
4. User program
5. Application example: overhead crane control

10. DIDACTIC UNIT 10. INPUT AND OUTPUT INTERFACE IN THE PLC: TYPOLOGY AND DIAGNOSIS

1. Input and output interface
2. Digital input signals (on-off)
3. Analog input signals
4. relay outputs
5. Transistor outputs
6. Departures to Triac
7. Analog outputs
8. Diagnosis and verification of inputs and outputs through instrumentation
9. Analog inputs in PLC: normalization and scaling

MODULE 4. AIR CONDITIONING INSTALLATIONS

1. DIDACTIC UNIT 1. THERMOTECHNICS APPLIED TO AIR CONDITIONING INSTALLATIONS

1. Physical knowledge applied to air conditioning installations: speed, flow, pressure, energy, heat, cooling/heating power
2. Units used in air conditioning installations
3. heat transmission
4. Properties of insulating materials
5. Properties of the building walls (enclosures, walls, windows, floors)
6. Types of thermal loads
7. refrigeration production
8. Psychrometry and Hygrometry
9. Air properties and environmental comfort parameters

2. DIDACTIC UNIT 2. FLUID MECHANICS APPLIED TO AIR CONDITIONING INSTALLATIONS

1. Types of fluids used in air conditioning installations
2. Properties of heat transfer fluids
3. Static pressure, dynamic pressure and total pressure
4. Pressure losses or pressure drops
5. Absolute and relative pressure
6. Velocity, flow and pressure loss in ducts and pipes
7. Typical values of velocity and pressure loss in pipes
8. Typical values of velocity and pressure loss in ducts

3. DIDACTIC UNIT 3. CLASSIFICATION AND CONFIGURATION OF AIR CONDITIONING INSTALLATIONS

1. Air conditioning installations by the operating circuit
2. Installations depending on the fluid used
3. Installations depending on the equipment used
4. Mounting arrangements of the different cold generation systems
5. Constituent elements of the different types of installations
6. Operating principles
7. Facility configuration
8. Plans and principle diagrams
9. Energy efficiency of the facilities

4. DIDACTIC UNIT 4. COMPONENTS AND CALCULATION OF THE OPERATIONAL PARAMETERS OF THE AIR CONDITIONING INSTALLATIONS

1. Systems and functional groups that make up the installation
2. Identification of components and their mission in the installation
3. Regulation systems adopted for the correct operation of the installation
4. Materials used
5. Calculation of thermal loads for air conditioning
6. Diagrams of operating principle and air treatment in the installation
7. Definition of the tables, diagrams and curves that characterize the installation
8. Presentation and structure of an air conditioning installation project

5. DIDACTIC UNIT 5. CHARACTERISTICS AND CALCULATION OF THE ELEMENTS AND AUXILIARY EQUIPMENT OF AIR CONDITIONING INSTALLATIONS

1. Ducts and distribution elements
2. Pipes
3. Heat exchangers
4. Accumulator deposits
5. Expansion vessels
6. Water treatment equipment: anti-legionella treatments in cooling towers
7. Valves, pumps, filters and fans
8. Terminal elements (grid and diffusers)
9. Supports and fastenings
10. Dilators
11. Isolations

6. DIDACTIC UNIT 6. CHARACTERISTICS AND OPERATION OF THE REGULATION AND CONTROL EQUIPMENT OF THE INSTALLATION

1. Flow regulation equipment
2. Temperature regulation and control equipment
3. Hydraulic balancing equipment
4. Electronic regulation of motor speed
5. Control of thermo-hygrometric conditions
6. Indoor air quality control
7. Consumption accounting

7. DIDACTIC UNIT 7. AIR CONDITIONING INSTALLATION PROJECTS

1. Installation thermal balance
2. Type projects of air conditioning installations

MODULE 5. DIGITAL TWINS

1. DIDACTIC UNIT 1. INTRODUCTION TO DIGITAL TWINS

1. What is Digital Twins?
2. Fields of application of Digital Twins
3. Use of artificial intelligence and Machine Learning in Digital Twins
4. Digital Twins as a tool in production
5. Monitoring the digital twin in decision making
6. Communication between real system and Digital Twin

7. Optimizing maintenance with Digital Twins

2. DIDACTIC UNIT 2. MECHANICAL MANUFACTURING PRODUCTION SIMULATION

1. Concept, classification and applications
2. Clock management in discrete simulation
3. Random simulation, sample collection and results analysis
4. Introduction to simulation languages

3. DIDACTIC UNIT 3. CONTEXT OF SIMULTANEOUS ENGINEERING AND PRODUCT LIFE CYCLE

1. Background and emergence of simultaneous engineering techniques
2. Production control from design
3. Design for six sigma DFSS
4. Definition and trends of Concurrent Engineering
5. Conventional engineering VS concurrent engineering
6. Fundamentals and common elements of concurrent engineering tools: the T's
7. Product life cycle
8. "Design for X" tools
9. Examples of application of simultaneous engineering

4. DIDACTIC UNIT 4. INTEGRATION OF CONCURRENT ENGINEERING WITH THE QUALITY MANAGEMENT SYSTEM

1. Parallels between quality and simultaneous engineering
2. Quality improvement tools
3. Quality assurance: ISO and PDCA
4. Total quality management: EFQM
5. Cause-Effect Diagram
6. Pareto diagram
7. Quality Control Circles

5. DIDACTIC UNIT 5. FUNDAMENTALS OF PROCESS CONTROL AND SUPERVISION SYSTEMS: SCADA AND HMI

1. Evolutionary context of visualization systems
2. Advanced industrial organization systems: ERP and MES
3. Prior supervision and control considerations
4. The concept of "real time" in a SCADA
5. Concepts related to SCADA
6. Definition and characteristics of distributed control systems
7. SCADA Systems vs DCS
8. Technical-economic viability of a SCADA system
9. Current SCADA Developer Market
10. Industrial PCs and expansion cards
11. HMI operator screens
12. Characteristics of an HMI screen
13. HMI screen programming software
14. Tablet PC devices

6. DIDACTIC UNIT 6. BUSES AND INDUSTRIAL NETWORKS. INITIAL CONCEPTS

1. Field buses: application and fundamentals
2. Evaluation of industrial buses
3. Differences between conventional wiring and bus wiring
4. Selecting a field bus
5. Operation and architecture of nodes and repeaters
6. Standard connectors
7. Normalization
8. Industrial communications applied to installations in Home Automation and Inmotics
9. Proprietary buses and open buses
10. Trends
11. Network management

7. DIDACTIC UNIT 7. OPERATION AND APPLICATION OF THE MAIN INDUSTRIAL BUSES

1. Bus classification
2. AS-i (Actuator/Sensor Interface)
3. DeviceNet
4. CANopen (Control Area Network Open)
5. SDS (Smart Distributed System)
6. InterBus
7. WorldFIP (World Factory Instrumentation Protocol)
8. HART (Highway Addressable Remote Transducer)
9. P-Net
10. BITBUS
11. ARCNet
12. CONTROLNET
13. PROFIBUS (PROcess Field BUS)
14. FIELDBUS FOUNDATION
15. MODBUS
16. INDUSTRIAL ETHERNET

8. DIDACTIC UNIT 8. CMMS - COMPUTER AIDED MAINTENANCE MANAGEMENT

1. What is CMMS
2. What is CMMS - GMAC
3. Advantages of using CMMS Programs - CMMS Software
4. The best CMMS Programs - CMMS Software
5. Modules of a CMMSHow to choose a CMMS Program - CMMS Software
6. How to choose a CMMS Program - CMMS Software
7. PMX-PRO Free Maintenance Software

MODULE 6. PRODUCTION MANAGEMENT IN MANUFACTURING

1. DIDACTIC UNIT 1. STRUCTURE OF THE LEAN SYSTEM

1. Principles of the Toyota Way
2. Lean Organization Structure
3. Focus on time: speed
4. Basic Lean Tools
5. Lean principle of zero defects
6. Ishikawa or cause-effect diagram
7. Jidoka: autonomization of defects

8. Poka Yoke: automatic elimination of non-quality operations

2. DIDACTIC UNIT 2. 5S METHOD AND STANDARDIZATION

1. Introduction and previous concepts about S
2. Resistance to the implementation of the S
3. SEIRI or Selection
4. SEITON or order
5. SEISO or cleaning
6. SEIKETSU or standardization
7. SHITSUKE, sustain, discipline or continue improving
8. General procedure for implementing the S

3. DIDACTIC UNIT 3. JUST IN TIME AND PRODUCTION LEVELING

1. Just in time (JIT)
2. JIT Cadence Principle: Takt Time
3. Stacked Bar Chart (Yamazumi)
4. Demand Leveling: Heijunka Technique

4. DIDACTIC UNIT 4. VSM TECHNIQUE ADDED VALUE MAP AND SMED

1. Process mapping and reengineering: Value Stream Mapping (VSM)
2. Value Stream Map (VSM)
3. SMED: quick change of machines
4. Stages of the SMED method
5. Application techniques for the analysis and implementation of SMED Examples

5. DIDACTIC UNIT 5. TOTAL QUALITY MANAGEMENT AND KAIZEN

1. Total Quality Management TQM Quality assurance systems
2. Continuous improvement and total quality
3. Quality control in design phase+B301
4. Quality control in the manufacturing process phase: self-control and release of fine-tuning
5. Final quality control stage
6. Statistical Process Control SPC
7. Descriptive statistics: calculation of the mean and standard deviation
8. Using control/trend charts: LCS upper limit and LCI lower limit
9. Process Capability KPI Cp and Cpk Calculation
10. Quality indicators: defects per million, first-time quality and normal performance
11. Traceability
12. Kaizen
13. Suggestion system
14. Short interval management (GIC)

6. DIDACTIC UNIT 6. THE SIX SIGMA METHODOLOGY: UNE-ISO 13053

1. The idea of an acceptable error rate
2. History of Six Sigma
3. Definition of Six Sigma
4. Six Sigma VS Total Quality VS Quality Assurance
5. DMAIC Phases for Six Sigma: Definition, Measurement, Analysis, Improvement and Control
6. Six Sigma project selection

7. Recommendations, factors and barriers to success in a Sigma project according to UNE-ISO 13053-1
8. Motorola stages for improving process performance with six sigma
9. Calculation of the six sigma level Application examples

MODULE 7. INTRODUCTION TO ROBOTICS

1. DIDACTIC UNIT 1. BASES AND BACKGROUND OF ROBOTICS

1. Concept and history
2. Bases of current robotics
3. Mobile platforms
4. Expected growth in the robotics industry
5. Limits of current robotics

2. DIDACTIC UNIT 2. ROBOTICS AND ARTIFICIAL INTELLIGENCE

1. Robotics
2. Artificial intelligence
3. Goals of artificial intelligence
4. History of artificial intelligence
5. Programming language: the language of robots
6. Research and development in areas of artificial intelligence
7. Robotics and artificial intelligence

3. DIDACTIC UNIT 3. USE OF ROBOTS

1. Introduction
2. Robotics and benefits
3. industrial robotics
4. Future of robotics
5. Robotics and new technologies
6. Trends

4. DIDACTIC UNIT 4. EVOLUTION OF ROBOTS. ROBOTIST

1. Evolution of robotics
2. Future of robotics
3. Robotics in engineering and industry

5. DIDACTIC UNIT 5. EVOLUTION OF ARTIFICIAL INTELLIGENCE. ROBOTIC NEURAL NETWORK DESIGNER

1. Natural and artificial intelligence
2. Artificial intelligence and cybernetics
3. Autonomy in robotics
4. Expert systems
5. Virtual agents with computer facial animation
6. News

6. DIDACTIC UNIT 6. ROBOTIC PROSTHESES

1. Robotics applied to humans: bionics

2. Historical review of prostheses
3. Prosthesis design in the 20th century
4. Recent research and development in hand design
5. Prosthetic systems
6. Use of smart materials in prostheses

7. DIDACTIC UNIT 7. INFLUENCE OF ROBOTICS

1. Introduction
2. Current situation and trends for the future
3. Objectives
4. Methodology and structure

MODULE 8. INTERPRETATION OF PLANS. INDUSTRIAL ENGINEERING SPECIALTY

1. DIDACTIC UNIT 1. INTRODUCTION TO THE REPRESENTATION AND INTERPRETATION OF PLANS

1. Introduction
2. Course objectives

2. DIDACTIC UNIT 2. RULES OF REPRESENTATION

1. Introduction
2. DIN Standards: Deutsches Institut für Normung - German Institute for Standardization
3. ISO Standards: International Organization for Standardization
4. Spanish UNE standards
5. Importances of standards

3. DIDACTIC UNIT 3. TYPE OF TECHNICAL AND FORMAL DRAWINGS

1. Introduction
2. Drawing Classification
3. Types of formats

4. DIDACTIC UNIT 4. LINES

1. Introduction
2. Line width
3. Spacing between the lines
4. Priority order of matching lines
5. Termination of reference lines
6. Guidelines on the use of the lines

5. DIDACTIC UNIT 5. SCALES

1. Introduction
2. Types of scales
3. Graphic, numerical and unit-by-unit scale
4. The scalemeter

6. DIDACTIC UNIT 6. BOUNDATION

1. Introduction
2. Types of dimensioning
3. Dimensions functionality
4. General dimensioning rules
5. Dimensioning elements
6. Dimension lines
7. Auxiliary elevation lines
8. Reference lines
9. Ends and indication of origin
10. Dimension figures
11. Complementary letters and symbols
12. Arrangement of dimensions in technical drawings
13. Particular cases

7. DIDACTIC UNIT 7. PLANE REPRESENTATION SYSTEMS (I)

1. Introduction
2. Conventional views
3. Standard projection systems
4. Particular views
5. Cuts, sections and breaks
6. Other conventions in Technical Drawing

8. DIDACTIC UNIT 8. PLANE REPRESENTATION SYSTEMS (II)

1. Fundamentals of representation systems
2. Dihedral or Monge system
3. Axonometric Systems
4. Introduction to the Bounded System
5. Conical perspective

9. DIDACTIC UNIT 9. THE INSTALLATION PLANS

1. Introduction
2. Sanitation Plans
3. Plumbing Plans
4. Gas Plans
5. Electricity Plans
6. Telecommunications Plans
7. Air Conditioning Plans

MODULE 9. FINAL PROJECT

Qualification

University Degree in Master of Lifelong Training in Industrial Automation Engineering and Industry 4.0 issued by the Antonio de Nebrija University with 60 ECTS University Credits. Teachings not leading to obtaining an official qualification

Objectives

- • Direct the selection and integration of advanced components in automation systems, optimizing their symbology and functionality. • Design and implement assembly and assembly strategies for complex electrical and electronic equipment, guaranteeing operational efficiency and reliability. • Interpret and validate highly complex electrical and electronic diagrams, applying international symbology and coding regulations. • Manage the application of connection and connectorization techniques in electrical and electronic installations, ensuring safety, performance and regulatory compliance. • Implement predictive and preventive maintenance programs for automated systems, evaluating their impact on operational continuity and the useful life of the equipment. • Evaluate the performance of automated systems, identifying opportunities for continuous improvement and leading their strategic optimization. • Integrate a comprehensive perspective of electricity and automation for strategic decision making in the management of projects and industrial processes. • Supervise the start-up and complete life cycle of automated systems, applying advanced verification, adjustment and validation protocols.

What does it prepare you for?

This program prepares you to lead the transformation of production processes through an advanced specialization in industrial engineering. You will develop the ability to design, assemble and maintain complex automated and industrial systems, accurately interpreting advanced electrical and electronic diagrams. You will specialize in process optimization for the continuous improvement of technological infrastructure. You will learn to supervise the start-up of industrial automation systems, applying preventive and corrective maintenance techniques that ensure continuous operation and extension of the useful life of the equipment. You will manage facilities with a strategic perspective, optimizing resources and guaranteeing operational efficiency. You will master the management of programmable controllers, integrating them into cutting-edge solutions. This training equips you with the skills to make critical decisions, promote innovation and optimize the management of technological infrastructure in any industrial environment, preparing you to face the challenges of the sector.

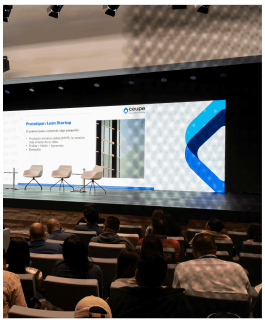
Who is it addressed to?

This master's degree is aimed at engineering professionals, technicians and other specialists who already have solid knowledge in industrial electricity, automation and air conditioning. It is ideal for those working in the industrial sector and seeking high-level specialization, offering a strategic perspective and the necessary advanced tools. This program is for you if you are interested in delving deeper into areas such as the assembly and maintenance of electrical equipment, PLC programming, the design of pneumatic and hydraulic automation, and the efficient management of production systems. It is designed for those seeking to transform their decision-making and leadership capacity in complex projects, promoting innovation and efficiency in their organizations.

Professional Outings

- Specialization in industrial engineering positions you to assume highly responsible roles in the sector. You will be able to lead teams as a Senior Industrial Automation Engineer, where you will design and implement advanced solutions for production systems, integrating programmed logic and the most recent automation technologies. You will also project yourself as Responsible for Maintenance of Automated Systems, optimizing operation and applying preventive and corrective strategies in complex infrastructures, based on specialized knowledge of electrical and electronic equipment. Your expertise will allow you to stand out as a Technical Consultant Specialized in assembly and connection of equipment, advising on large-scale projects and guaranteeing the correct interpretation of diagrams and regulations. Additionally, you will be able to direct the supervision of the start-up of facilities, ensuring the efficient integration of components and the validation of systems. This training prepares you for the strategic management of technological infrastructure, promoting innovation and continuous improvement in industrial environments.







Live Madrid

Live the International Week

As an additional complement to your training, you can be part of the SIM: Week International in Madrid. A unique meeting that brings together students from all over the world. For seven days you can live an academic and cultural experience in the heart of Europe, culminating with the graduation ceremony in Madrid.

- Conferences and workshops with international experts
- Visits to companies and reference organizations
- Networking with students from different countries
- Cultural activities and discovery of Madrid
- graduation ceremony

Structural

Structuralia is a leading educational institution in postgraduate and highly specialized online training, focused on the fields of engineering, architecture, construction, energy, technology and digital transformation.

Founded in 2001 with a strong industrial DNA, the result of collaboration between large companies in the sector and the Universitat Politècnica de Catalunya (UPC), for more than 25 years we have accompanied technical professionals in their academic and professional development through practical, flexible training aligned with the reality of the labor market.

Our training proposal connects advanced technical knowledge, real employability and international projection, acting as key support in the professional evolution of those seeking to specialize, grow professionally and generate impact in their sector, with a firm commitment to the democratization of access to technical excellence.



+350.000

Students have gone through our virtual classrooms



+20 years

Experience in the training sector



5 stars

QS ranking in online education

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Group

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When you enroll in a course or master's degree, you will get a free subscription to MyLXP while your training lasts. You will have access to more than 400 key courses (soft skills, languages, digital skills, etc.) and other surprises. Sign up and see how MyLXP improves your learning.

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The comprehensive tailored online education experience

EDUCA LXP is more than a methodology, it is a completely educational experience personalized thanks to all the possibilities offered by artificial intelligence. Now the content adapts to you, your needs and preferences, while offering you access to updated and practical content that really makes a difference in the labor market.

Flexibility

100% online learning adapted to your schedule: study from any device wherever, whenever and however you want.

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Discover PHIA, your learning assistant that will help you every step of the way.

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Didactic approach oriented to work by competencies, which favors practical and meaningful learning.

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You will have access to more than 400 key courses (soft skills, languages, competencies digital, etc.) and other surprises. Sign up and see how MyLXP improves your learning.

Meet PHIA, your personalized learning assistant

Use all the possibilities of artificial intelligence to get the most out of it match to your training

EDUCA EDTECH Group leads the digital revolution in education, promoting the continuous learning and technological transformation. The group is made up of recognized training institutions and its mission is to democratize access to education, promote the transfer of knowledge, technological development and research.

With the experience accumulated over more than 20 years, we have perfected our learning platform EDUCA LXP (Learning Experience Platform), the basis of our educational methodology, which provides students with online training practical and meaningful.



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