

Máster online 100%

Master in Robotic Systems and Automation Engineering + 60 ECTS Credits

Structuralia

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Master in Robotic Systems and Automation Engineering + 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 Robotic Systems and Automation Engineering is an advanced program designed for engineering and industrial professionals seeking deep specialization and updating in robotics and automation. This program offers you an in-depth look at the most advanced industrial automation technologies, where efficiency and precision are critical factors for competitiveness. You will develop a specialization in the integration of robots and the strategic management of automation technologies, addressing the current challenges of the sector. You will explore the evolution of industrial robotics, from its foundations to the strategic incorporation of robots in automated lines, analyzing their technical and morphological characteristics for optimal implementation. You will delve into the operation of actuator equipment and the implementation of sensors, understanding their critical role in the operability and reliability of the systems. You will acquire advanced skills in guided and textual programming of robots, mastering the necessary tools to optimize their performance and efficient management of the controller unit. You will delve into terminal elements and their specific applications, such as Pick and Place, and specialized components for high-precision tasks such as painting, welding, and assembly. This Master prepares you to lead the digital transformation, managing the implementation of advanced solutions in robotic engineering and automation,

consolidating your profile as a reference in the industrial sector. You will obtain a strategic vision to optimize productivity and innovation in any industrial environment.

Agenda

MODULE 1. INDUSTRIAL ROBOTS

1. DIDACTIC UNIT 1. ROBOTICS. EVOLUTION AND MAIN CONCEPTS

1. Introduction to robotics
2. Context of industrial robotics
3. Current market for manipulator arms
4. What is meant by Industrial Robot
5. Elements of a robotic system
6. Subsystems of a robot
7. Tasks performed with robotics
8. Robot classification

2. DIDACTIC UNIT 2. INCORPORATION OF THE ROBOT IN AN AUTOMATED LINE

1. The role of Robotics in automation
2. Interaction of robots with other machines
3. The robotic cell
4. Technical and economic study of the robot
5. Regulations
6. Accidents and safety measures

3. DIDACTIC UNIT 3. TECHNICAL AND MORPHOLOGICAL CHARACTERISTICS OF ROBOTS

1. Robot arm components
2. Robot features and capabilities
3. Definition of degrees of freedom
4. Definition of load capacity
5. Definition of movement speed
6. Spatial resolution, accuracy, repeatability and flexibility
7. Definition of workload
8. Considerations on control systems
9. Robot morphology
10. Cartesian coordinate type. Cantilever and porch
11. Cylindrical typology
12. Spherical type
13. Universal robot arms

4. DIDACTIC UNIT 4. ACTUATING EQUIPMENT

1. Typology of actuators and transmissions
2. Operation and characteristic curves
3. Servomotor Operation
4. Stepper motors
5. Hydraulic Actuators
6. Pneumatic Actuators
7. Comparative study
8. Transmission typology

5. DIDACTIC UNIT 5. SENSORS IN ROBOTICS

1. Sensory devices
2. Technical characteristics
3. Commissioning of sensors
4. Non-optical position sensors
5. Optical position sensors
6. speed sensors
7. Proximity sensors
8. Force sensors
9. Computer vision

6. DIDACTIC UNIT 6. THE CONTROLLER UNIT

1. The controller
2. Hardware
3. Control methods
4. The processor in a robotic controller
5. Real-time execution

7. DIDACTIC UNIT 7. TERMINAL ELEMENTS AND TRANSFER APPLICATIONS. PICK AND PLACE

1. Robot terminal elements and actuators
2. Connection between wrist and end tool
3. Use of robots to transfer materials and automated loading/unloading. Pick and place
4. Material transfer applications. Pick and place
5. Picking and holding parts by vacuum. Suction cups
6. Permanent magnets and electromagnets
7. Mechanical gripping forceps
8. Adhesive systems
9. Fluidic systems
10. Hitch Grip

8. DIDACTIC UNIT 8. COMPONENTS FOR PAINTING, WELDING AND ASSEMBLY TASKS

1. Robotic painting
2. The painting system. Mixer and equipment
3. robotic welding
4. TIG and MIG welding
5. Spot welding
6. laser welding
7. The assembly process
8. Assembly methods
9. Pairing and joining parts
10. Piece arrangement

9. DIDACTIC UNIT 9. GUIDED AND TEXTUAL PROGRAMMING

1. Initial Robot Programming Concepts
2. Guided programming. Passive and Active
3. The ideal textual language for programming robots

4. Existing typologies of textual languages
5. General characteristics
6. Robot, object and task oriented programming
7. Robot level programming
8. Object level programming
9. Task-level textual programming
10. The V+ or V3 language
11. The RAPID programming language
12. The IRL language
13. The OROCOS language
14. CAD programming

MODULE 2. TREND AND FUTURE OF 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 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 4 standard. Boolean algebra
4. Fundamental postulates of Boolean Algebra applied to electrical contacts
5. 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. INDUSTRIAL COMMUNICATION NETWORKS AND BUSES

1. DIDACTIC UNIT 1. INTRODUCTION AND OPERATION OF COMMUNICATION NETWORKS

1. The need for industrial communication networks
2. Centralized, distributed and hybrid control systems
3. Advanced industrial organization systems: ERP and MES
4. The CIM pyramid and industrial communication
5. Control networks versus data networks
6. Field buses, industrial LANs and LAN/WAN
7. Control network architecture: ring, star and bus topology
8. Application of the OSI model to industrial networks and buses
9. Fundamentals of transmission, access control and addressing in industrial networks
10. Security procedures in the communications network
11. Introduction to RS, RS, IEC, ISOCAN, IEC, Ethernet, USB standards

2. DIDACTIC UNIT 2. 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

3. DIDACTIC UNIT 3. 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

4. DIDACTIC UNIT 4. OPERATION AND COMPONENTS OF THE AS-INTERFACE BUS (AS-I)

1. History of the AS-Interface bus
2. AS-i bus characteristics
3. AS-i bus components gateways...
4. Assembly and composition
5. AS-Interface network configuration
6. Application of the ISO/OSI albus AS-i model
7. Connectivity and gateways
8. The slave and communication with sensors and actuators (Interface)
9. Transmission systems (Interface)
10. The AS-i Master (Interface)
11. The AS-Interface protocol: characteristics, coding, media access, errors and configuration
12. Operational phases of bus operation

5. DIDACTIC UNIT 5. OPERATION AND COMPONENTS OF THE PROFIBUS FMS, DP AND PA BUS

1. PROFIBUS (Process Field BUS)
2. Introduction to Profibus
3. Using PROFIBUS profiles for DP, PA and FMS
4. ISO OSI Model for Profibus
5. Cable for RS-, fiber optic and IEC -
6. Data coordination in Profibus
7. Profibus DP Basic Functions and Configuration
8. Profibus FMS
9. Communication and applications of Profibus-PA
10. Troubleshooting with Profisafe
11. Applications for special devices
12. GSD files and ID number for device connection

6. DIDACTIC UNIT 6. OPERATION AND COMPONENTS OF THE CAN PROTOCOL AND THE CANOPEN BUS

1. CAN protocol basics
2. Frame format in the CAN protocol
3. Study of media access in the CAN protocol
4. Synchronization
5. Topology
6. Typology of CAN connectors
7. Applications: CANopen, DeviceNet, TTCAN...
8. Introduction to the CANopen BUS
9. CANOpen Simplified Architecture
10. Using the object dictionary in CANopen
11. Profiles
12. Management of cattle
13. CANopen structure: definition of SDOs and PDOs

7. DIDACTIC UNIT 7. INDUSTRIAL ETHERNET

1. Ethernet and the industrial field
2. The advantages of industrial Ethernet over the rest
3. Solutions to make Ethernet compatible in industry
4. Protocol Evolutions: RETHER and ETHEREAL
5. Priority mechanisms in Ethernet: IEEE P and switch configuration
6. Components and schematics
7. Use of industrial Ethernet in field buses
8. PROFINET
9. EtherNet/IP
10. ETHERCAT

8. DIDACTIC UNIT 8. WIRELESS NETWORKS

1. Context of wireless technology in industrial applications
2. Wireless Systems
3. Components
4. Wireless in the industry
5. Transmission technologies
6. Wireless typologies
7. Wireless network parameters
8. Antennas
9. Wireless Ethernet
10. IEEE Standard
11. Security elements in a Wi-Fi network

MODULE 5. HMI AND SCADA SYSTEMS IN INDUSTRIAL PROCESSES

1. DIDACTIC UNIT 1. 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

2. DIDACTIC UNIT 2. SCADA HARDWARE: MTU, RTU AND COMMUNICATIONS

1. General operating principle of a SCADA system
2. Subsystems that make up a supervision and command system
3. Components of an RTU, operation and characteristics
4. Telemetry systems: generic, dedicated and multiplexers

5. RTU control and communications software
6. Types of capabilities of an RTU
7. Interrogation, exception reporting, and RTU-initiated transmissions
8. Communications failure detection
9. Phases of implementation of a SCADA in a facility

3. DIDACTIC UNIT 3. SCADA SOFTWARE AND OPC UA COMMUNICATION

1. Object-oriented programming fundamentals
2. Driver, development utilities and Run-time
3. Development Utilities and Run-time Program
4. Using databases for storage
5. Communication methods between applications: OPC, ODBC, ASCII, SQL and API
6. The evolution of the OPC protocol to OPC UA (Unified Architecture)
7. Configuration of OPC controls in the SCADA

4. DIDACTIC UNIT 4. IMPLEMENTATION PLANS AND DRAWINGS

1. Symbols and diagrams
2. Identification of instruments and functions
3. Symbology used in process control
4. Design of implementation and distribution plans
5. Typology of symbols
6. Examples of schemes

5. DIDACTIC UNIT 5. INTERFACE DESIGN WITH STANDARDS

1. Initial Fundamentals of Automated System Design
2. Presentation of some standards and methodological guides
3. industrial design
4. Design of control and indication elements
5. Colors in the service bodies
6. Location and use of control elements

6. DIDACTIC UNIT 6. GEMMA: GUIDE TO THE START AND STOP MODES IN AN AUTOMATION

1. Origin of the GEMMA guide
2. GEMMA Basics
3. State-rectangles: operating, shutdown or defect procedures
4. GEMMA use methodology
5. Selection of start and stop modes
6. Implementation of GEMMA to GRAFCET
7. Base GRAFCET enrichment method
8. Method by decomposition by TASKS: vertical or hierarchical coordination
9. Alarm treatment with GEMMA

7. DIDACTIC UNIT 7. DEVELOPMENT MODULES

1. Common software packages
2. Configuration Module Graphical Operator Interface Tools
3. Utilities for process control
4. Trending Representation

5. Alarm and event management tools
6. Recording and archiving of events and alarms
7. Reporting tools
8. Recipe creation tool
9. Communications Settings

8. DIDACTIC UNIT 8. INTERFACE DESIGN IN HMI AND SCADA

1. Initial design criteria
2. Architecture
3. Considerations in the distribution of screens
4. Choice of screen navigation
5. Appropriate use of color
6. Correct use of textual information
7. Adequate definition of equipment, states and process events
8. Use of information and process values
9. Trend tables and graphs
10. Commands and data entry
11. Correct implementation of Alarms
12. Evaluation of SCADA designs

MODULE 6. INDUSTRIAL MAINTENANCE

1. DIDACTIC UNIT 1. MAINTENANCE ORGANIZATION

1. The objectives and functions of maintenance
2. Corrective, preventive and predictive maintenance
3. Total Productive Maintenance
4. Organization, materials and spare parts catalog in the maintenance warehouse
5. Computer-aided management and maintenance programs (G.M.A.O)
6. Maintenance sheets: work order, maintenance ranges and standards
7. The historical bank of interventions
8. Organization of maintenance management
9. The quality of maintenance.

2. DIDACTIC UNIT 2. 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 CMMS
6. How to choose a CMMS Program - CMMS Software
7. PMX-PRO Free Maintenance Software

3. DIDACTIC UNIT 3. CONCEPTS AND EQUIPMENT USED IN INDUSTRIAL AUTOMATION

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

6. Man-machine dialogue, HMI and SCADA

4. DIDACTIC UNIT 4. ROBOTICS. EVOLUTION AND MAIN CONCEPTS

1. robotics
2. Evolution of industrial robots. Robotics
3. Manipulator robot manufacturers
4. Definition of Robot
5. Basic components of a robotic system
6. Structural and functional subsystems
7. Robotics applications
8. Robot classification criteria

5. DIDACTIC UNIT 5. ELECTRICAL INSTALLATIONS APPLIED TO AUTOMATED INSTALLATIONS

1. Types of engines and fundamental parameters
2. Starting and reversing procedures for motors
3. Protection systems for electrical lines and receivers
4. Motor speed variators. Regulation and control
5. Protection devices for electrical lines and receivers
6. DIDACTIC UNIT 6. COMPONENTS OF ELECTRICAL AUTOMATIONS
7. Sequential and continuous automations. Wired automations
8. Elements used in the creation of automation: operator elements, relay, sensors and transducers
9. Cables and cable management systems
10. Design techniques for wired automation for control and power
11. Assembly and verification techniques for wired automations

7. DIDACTIC UNIT 7. ADJUSTMENT AND ADJUSTMENTS OF AUTOMATED INSTALLATIONS

1. Adjustments and adjustments of mechanical, pneumatic and hydraulic systems
2. Adjustments and adjustments of electrical and electronic systems
3. PLC Program Settings among others
4. Adjustments and adjustments of electronic systems
5. Regulations and adjustments of regulation and control equipment
6. Assembly and commissioning reports

8. DIDACTIC UNIT 8. ELECTRICAL-ELECTRONIC CORRECTIVE MAINTENANCE

1. Interpretation of technical documentation
2. Typology of breakdowns
3. Diagnosis of faults in the electrical-electronic system
4. Machines, equipment, fixtures, tools and means used in maintenance
5. Maintenance of electrical and electronic systems
6. Equipment maintenance
7. Repair of electrical-electronic automation systems. Verification and commissioning
8. Repair and maintenance of electrical panels

MODULE 7. IOT: INTERNET OF THINGS

1. DIDACTIC UNIT 1. INTERNET OF THINGS

1. Context Internet of Things (IoT)
2. What is IoT?
3. Elements that make up the IoT ecosystem
4. IoT architecture
5. Devices and elements used
6. Examples of use
7. Challenges and future lines of work

2. DIDACTIC UNIT 2. TECHNOLOGIES APPLIED TO THE INTERNET OF THINGS

1. The relationship between M2M and IoT
2. IoT and Smart Cities
3. Intelligent transportation systems
4. Smart Home
5. DIDACTIC UNIT. 3 IOT DEVICES AND APPLICATIONS
6. Devices and IoT
7. Interfaces
8. 3D printing

4. DIDACTIC UNIT 4. IOT SECURITY

1. ICT security
2. Types of ICT security
3. IoT Vulnerabilities
4. IoT-Specific Security Needs

5. DIDACTIC UNIT 5. ENERGY SYSTEMS BASED ON IOT

1. The importance of energy efficiency
2. The sources of consumption
3. IoT as a great ally of renewable energies
4. Microgrids

6. DIDACTIC UNIT 6. CYBERPHYSICAL SYSTEMS

1. Context Cyber-Physical Systems (CPS)
2. CPS Features
3. CPS Components
4. Examples of use
5. Challenges and future lines

7. DIDACTIC UNIT 7. INTERNET OF THINGS WITH ARDUINO

1. Introduction to Arduino
2. Features
3. Objectives
4. A trip through the past
5. The microcontroller
6. Hardware components

MODULE 8. ARTIFICIAL VISION AND ITS APPLICATION IN INDUSTRY 4.0

1. DIDACTIC UNIT 1. ARTIFICIAL VISION: DEFINITION AND MAIN ASPECTS

1. Artificial vision and its application in industry 4.0

2. DIDACTIC UNIT 2. COMPONENTS OF A ARTIFICIAL VISION SYSTEM

1. Optics
2. Lighting
3. Cameras
4. 3D systems
5. Sensors
6. Compact equipment
7. Methodologies for hardware selection

3. DIDACTIC UNIT 3. IMAGE PROCESSING USING ARTIFICIAL VISION

1. Algorithms
2. Software
3. Image segmentation and interpretation
4. Methodologies for software selection

4. DIDACTIC UNIT 4. APPLICATIONS OF VISION IN INDUSTRY 4.0

1. Classic applications: discrimination, fault detection...
2. New applications: OCR codes, traceability, robotics, recognition (OKAO)

MODULE 9. FINAL PROJECT

Qualification

University Degree in Master of Continuing Education in Robotic Systems Engineering and Automation issued by the Universidad Antonio de Nebrija with 60 ECTS University Credits. Non-official degree courses

Objectives

- • Lead the incorporation of robotic systems into automated production environments, improving operational efficiency. • Establish criteria for the selection and configuration of actuators and sensors, optimizing the functionality of the equipment. • Apply advanced programming methodologies for industrial robots, guaranteeing their optimal performance. • Manage controller units and terminal elements, adapting them to specific industrial applications such as Pick and Place. • Analyze the technical and morphological characteristics of robotics for its strategic implementation in the industry. • Integrate specialized components for high-precision tasks such as painting, welding and assembly into automated systems. • Anticipate and guide trends in robotic technologies, promoting innovation and competitiveness in the sector.

What does it prepare you for?

This program prepares you to lead the integration of robotic systems in advanced industrial environments, improving operational efficiency through industrial automation. You will develop the ability to design and implement solutions with robots, understanding their technical and morphological characteristics for optimal selection. You will learn to select and configure actuator and sensor equipment, optimizing their performance in various applications. You will master guided and textual robot programming, allowing you to create precise sequences for complex tasks such as Pick and Place, painting, welding and assembly. You will integrate a comprehensive understanding of the controlling unit and the terminal elements, which will allow you to make strategic decisions for the continuous improvement of automated lines. The Master in Robotic Systems and Automation Engineering trains professionals in the management of advanced solutions to optimize productivity. Additionally, you will position yourself to anticipate and direct future trends in robotics, driving innovation and competitiveness in your sector.

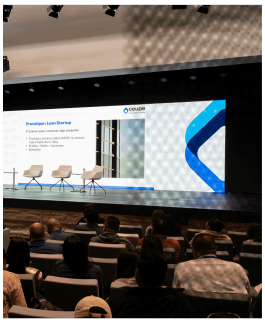
Who is it addressed to?

Engineering professionals and technical personnel already working in the industrial sector will find in this program a deep specialization in industrial robotics and automation. It is ideal for those interested in industrial robotic systems and the integration of systems in automated lines, providing you with the strategic vision to update your knowledge and make advanced decisions. It will allow you to master guided and textual robot programming, as well as the management of robotic actuators, sensors, and controllers. You will advance your career by leading projects for the incorporation of terminal elements and transfer, painting, welding or assembly applications, consolidating your role as an expert in the field of advanced automation.

Professional Outings

- Specialization in robotic systems engineering and industrial automation positions you to assume highly responsible roles in the manufacturing and technology sector. You will be able to work as an Industrial Robotics Integration Engineer, leading the implementation of robots in automated production lines and optimizing processes. You'll also work your way up as a Robot Programming Specialist, designing and optimizing work sequences for complex tasks such as painting, welding, or high-precision assembly. You will be an Automation Consultant, strategically advising on the selection and configuration of robotic actuators and sensors for specific projects. Additionally, you will be able to assume the role of Applied Robotics Project Manager, managing the incorporation of terminal elements and Pick and Place type transfer applications. Your advanced knowledge of controlling units and morphological characteristics of robots will allow you to direct technological evolution and innovation 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.

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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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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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Funding and scholarships

Finance your course or master's degree and enjoy the available scholarships. Contact our expert team to know which one best suits your profile.

25% Alumni Scholarship

15% Scholarship recommended

20% Functional Diversity Scholarship

20% Unemployment scholarship

15% GROUP Scholarship

20% Scholarship for Professionals, Healthcare, members

15% Entrepreneurship Scholarship

20% Large Family Scholarship