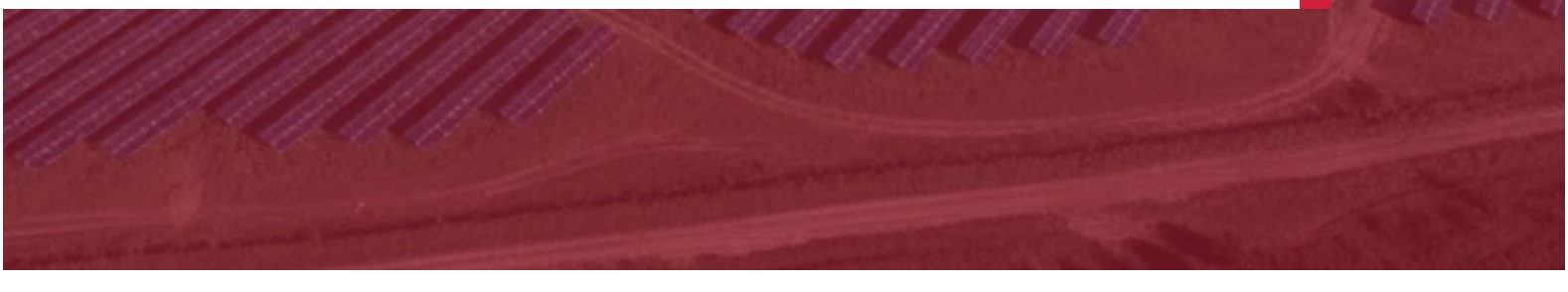


Máster online 100%

Master in Energy Efficiency and Renewable Energies + 60 ECTS Credits

Structuralia



Máster online 100%

Master in Energy Efficiency and Renewable Energies + 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 Energy Efficiency and Renewable Energies is a high-level training for professionals seeking specialization and updating in the transformation of the energy model. This program will allow you to delve deeper into the optimization of energy efficiency and the expansion of renewable energies, equipping you with a comprehensive vision to address complex energy projects. You will master advanced energy management in buildings and facilities, from improving efficiency to integrating renewable systems for industrial decarbonization. You will explore the current energy context, delving into the regulations for new buildings, such as the Technical Building Code (CTE) and the Energy Efficiency Certification (CEE). You will analyze strategies for the energy rehabilitation of existing buildings and the certification processes. The program addresses key energy systems in buildings, including HVAC, aerothermal, geothermal, ventilation and DHW. You

will specialize in lighting management and Building Management Systems (BMS), essential tools for advanced solutions in a sector in continuous transformation.

Agenda

MODULE 1. ENERGY IN BUILDING (ER)

1. DIDACTIC UNIT 1. THE ENERGY CONTEXT

1. Introduction
2. The international energy context
3. The Spanish energy context
4. European regulatory framework in building energy
5. USA regulatory framework, ASHRAE standards

2. DIDACTIC UNIT 2. NEWLY CONSTRUCTED BUILDINGS. CTE AND CEE

1. New building. Introduction to CTE and energy certification
2. The CTE. Basic habitability requirements
3. The CTE. Basic energy saving requirements (The RITE is seen in systems)
4. The energy certification
5. The recognized documents for energy certification and the regulatory relationship

3. DIDACTIC UNIT 3. EXISTING BUILDINGS

1. Existing buildings. The energy audit
2. Energy audit. Phase 1: Analysis of the current situation
3. Energy audit. Phase 2: Proposals and economic analysis
4. European regulations. Series UNE-EN_16247-1,2,3,4:2012
5. ASHRAE Energy Audit II

4. DIDACTIC UNIT 4. ENERGY CERTIFICATION IN EXISTING BUILDINGS

1. Existing buildings. The energy certification
2. The CE3X program. Definition of the envelope
3. The CE3X program. Systems definition
4. The CE3X program. Results and improvement measures
5. The CE3X program. Case study

MODULE 2. ENERGY SYSTEMS IN THE BUILDING: HVAC AND ACS

1. DIDACTIC UNIT 1. HVAC SYSTEM WITH CONVENTIONAL EQUIPMENT

1. Introduction to HVAC system
2. primary loop
3. Secondary loop
4. Heat and cold generation
5. Transport fluid and terminal units

2. DIDACTIC UNIT 2. AEROTHERMY AND GEOTHERMY SYSTEMS

1. Aerothermal. Concept and features
2. Aerothermal. Design and calculation
3. Geothermal. Concept and features

4. Geothermal. Design and calculation
5. Comparative study

3. DIDACTIC UNIT 3. VENTILATION

1. Introduction to ventilation
2. Ventilation systems in residential buildings
3. Ventilation in tertiary buildings
4. Primary air conditioners
5. Ventilation systems, design and calculation

4. DIDACTIC UNIT 4. ACS

1. Introduction
2. Demand assessment
3. Residential buildings. Design and calculation
4. Tertiary buildings. Design and calculation
5. Case study

MODULE 3. ENERGY SYSTEMS IN THE BUILDING: LIGHTING AND BMS

1. DIDACTIC UNIT 1. LIGHTING SYSTEMS

1. Concepts and Regulations
2. Efficient technology in lamps and luminaires
3. Efficient technology in equipment and control
4. Lighting audit
5. Design Criteria and Recommendations

2. DIDACTIC UNIT 2. CONTROL AND MANAGEMENT SYSTEMS 1

1. Introduction
2. Control systems
3. Control signs. Sensors
4. Control signs. Actuators
5. Control systems. Drivers

3. DIDACTIC UNIT 3. CONTROL AND MANAGEMENT SYSTEMS 2

1. Control signs. Walkways or gateway
2. Control signs. Measurement and monitoring
3. Management systems
4. Advanced management systems
5. Systems Integration

4. DIDACTIC UNIT 4. ENERGY MANAGEMENT AND MARKETS

1. ISO 50001 and Directive 2012/27/EU
2. The electricity market, tariff regime
3. Financial management in energy projects
4. Energy Services Companies (ESE)

MODULE 4. INTEGRATION OF RENEWABLE ENERGY IN BUILDINGS

1. DIDACTIC UNIT 1. SOLAR THERMAL

1. Principles of solar thermal
2. Resource evaluation
3. Low temperature solar energy
4. solar cooling
5. Concentrated solar

2. DIDACTIC UNIT 2. SOLAR PHOTOVOLTAIC

1. Photovoltaic effect
2. Components of a photovoltaic system
3. Current state of technology and market
4. Design and calculation of photovoltaic systems
5. Regulation and regulations

3. DIDACTIC UNIT 3. WIND ENERGY

1. Resource evaluation
2. Technology Description
3. Sizing and calculation of the energy produced
4. Mini wind installations in the urban environment
5. Economics and environmental impact of wind power

4. DIDACTIC UNIT 4. BIOMASS ENERGY

1. Biomass utilization
2. Energy use
3. Use in building
4. Systems and equipment
5. district centers

MODULE 5. ENERGY EFFICIENCY IN THE INDUSTRY

1. DIDACTIC UNIT 1. CURRENT ENERGY SITUATION

1. Energy in industry
2. The importance of energy efficiency
3. Energy legislation
4. Subsidies, financing and other initiatives to promote energy efficiency in industry
5. Success stories

2. DIDACTIC UNIT 2. THE ENERGY MANAGER

1. The position of the energy manager (I). Responsibilities
2. The position of the energy manager (II). Responsibilities
3. Energy Service Company (ESE)
4. Regulations for the application of the ESEs
5. Practical examples of ESEs

3. DIDACTIC UNIT 3. THE ENERGY AUDIT IN THE INDUSTRY

1. Basics
2. Energy audit process methodology

3. Action plans
4. Results: energy indicators
5. Success stories

4. DIDACTIC UNIT 4. ENERGY SYSTEMS IN INDUSTRY AND SAVING SOLUTIONS

1. Thermal system
2. electrical system
3. industrial cold
4. Lighting
5. Energy efficiency solutions in industry

MODULE 6. PHOTOVOLTAIC SOLAR ENERGY

1. DIDACTIC UNIT 1. SOLAR RESOURCE AND PHOTOVOLTAIC EFFECT

1. The energy of the sun
2. Radiation measurement and databases
3. The photovoltaic effect
4. The solar cell
5. photovoltaic solar panel

2. DIDACTIC UNIT 2. SOLAR PHOTOVOLTAIC TECHNOLOGIES

1. Crystalline silicon panel technology
2. Crystalline silicon technology
3. Thin film panel technology
4. Thin film panel technology
5. Concentrated solar photovoltaic

3. DIDACTIC UNIT 3. ELECTRICAL ENERGY PRODUCED BY A PHOTOVOLTAIC SOLAR PLANT. PVSYST PROGRAM

1. Solar energy produced. PR concept
2. PVsyst. Definition of the site and meteorological base
3. PVsyst. Component modeling (I)
4. PVsyst. Component modeling (II)
5. PVsyst. Energy simulation and results

4. DIDACTIC UNIT 4. MAIN EQUIPMENT AND INFRASTRUCTURES

1. Photovoltaic self-consumption. Simulation with PVsyst program
2. Structures and solar trackers
3. Main electrical equipment
4. Medium voltage cables and electrical substation
5. civil works

MODULE 7. ALTERNATIVE RENEWABLE ENERGY. BIOETANOL, BIODIESEL, BIOGAS, BIOMASS COMBUSTION AND SOLAR THERMOELECTRIC

1. DIDACTIC UNIT 1. BIOMASS

1. Introduction to biomass
2. Biomass as an energy source

3. Characterization of biomass as an energy resource
4. The problem of the use of biomass
5. Biomass technologies and treatments

2. DIDACTIC UNIT 2. BIOGAS

1. Introduction to biogas
2. Biogas production
3. Biogas production technologies
4. Operations before and after biomethanization
5. Uses of biogas

3. DIDACTIC UNIT 3. BIOFUELS

1. HVO Biodiesel
2. Biodiesel FAME
3. Bioethanol
4. Bioethanol production

4. DIDACTIC UNIT 4. BIOMASS COMBUSTION

1. The combustion reaction. Reagents
2. The combustion reaction. Products
3. Design of combustion facilities
4. Electricity generation with biomass
5. Solar thermoelectric I
6. Solar thermoelectric II

MODULE 8. ENERGY IN A SMART CITY. ELECTRIC VEHICLE, SELF-CONSUMPTION, DISTRIBUTED GENERATION AND SMART GRIDS

1. DIDACTIC UNIT 1. INTRODUCTION. SMART CITY CONCEPT

1. Introduction and Objectives
2. Smart cities
3. Some Smart Cities experiences
4. Energy in cities
5. The consumer at the center. Smart meters

2. DIDACTIC UNIT 2. SUSTAINABLE MOBILITY

1. Need for decarbonization of transportation
2. Possible actions to decarbonize transportation
3. The electric vehicle
4. The electric bus
5. New activity or business models

3. DIDACTIC UNIT 3. RENEWABLE DISTRIBUTED GENERATION

1. Overview of renewable distributed generation
2. Promotion of distributed generation and self-consumption
3. Incorporation of self-consumption in the electrical system
4. Energy communities
5. Some experiences

4. DIDACTIC UNIT 4. SMART NETWORKS

1. Distribution of electrical energy (I)
2. Distribution of electrical energy (II)
3. Networks in the face of the energy transition
4. New tools. Acquisition of flexibility
5. Smart Grids

MODULE 9. WIND ENERGY

1. DIDACTIC UNIT 1. PHYSICAL AND METEOROLOGICAL CONCEPTS OF WIND ENERGY

1. Wind energy history
2. Wind meteorology
3. Physics of the wind resource
4. Site selection
5. Wind measurement campaign

2. DIDACTIC UNIT 2. WIND TURBINE TECHNOLOGY AND WIND DATA ANALYSIS. WINDOGRAPHER PROGRAM

1. wind resource
2. Exercise. Descriptive statistical analysis of the wind resource
3. Wind turbines 1
4. Wind turbines 2
5. Wind turbines 3

3. DIDACTIC UNIT 3. MICROSITING STUDY USING A COMPUTATIONAL MODEL OF ELECTRICAL ENERGY PRODUCTION

1. WASP Program. Data analysis model (WAP CLIMATE ANALYST)
2. WASP Program. Topographic terrain model (WAP BAD EDITOR)
3. WASP Program. Wind Turbine Generator Model
4. WASP Program. Energy simulation I
5. WASP Program. Energy simulation II

4. DIDACTIC UNIT 4. WIND FARM DESIGN

1. Civil works of a wind farm
2. Electrical generation installations of a wind farm
3. High voltage electrical substation
4. High voltage overhead power line
5. offshore wind energy

MODULE 10. TFM. MASTER RENEWABLE ENERGY AND ENERGY EFFICIENCY

Qualification

University Degree in Master of Lifelong Training in Energy Efficiency and Renewable Energies issued by the Antonio de Nebrija University with 60 ECTS University Credits. Teachings not leading to obtaining an official qualification

Objectives

- • Lead comprehensive energy management projects, covering their technical, economic and regulatory dimensions. • Design advanced strategies to optimize energy efficiency in buildings and facilities. • Implement innovative solutions with renewable energy sources, such as aerothermal, geothermal and solar systems, for decarbonization. • Evaluate the technical-economic viability of projects incorporating renewable technologies and improving efficiency. • Manage the energy certification of buildings, applying the Technical Building Code (CTE) and current regulations. • Integrate air conditioning (HVAC), ventilation, ACS and lighting systems with Building Management Systems (BMS) for intelligent energy control. • Make strategic decisions based on data analysis for the continuous optimization of energy performance. • Interpret and apply the international regulatory framework and applicable legislation in efficiency and renewable energy projects.

What does it prepare you for?

This program prepares you to lead the transformation of the energy sector, equipping you with the skills to design and implement powerful energy management strategies. The Master in Energy Efficiency and Renewable Energies trains professionals in optimizing energy performance for the integration of sustainable solutions. You will learn to approach comprehensive improvement projects in buildings and facilities, from conception to implementation, considering all technical, legal and economic aspects. You will develop the ability to evaluate and select the most advanced technologies in sustainable building, such as high-efficiency HVAC systems, aerothermal, geothermal, and smart lighting solutions. You will make strategic decisions based on technical-economic viability analysis, optimizing the performance and integration of clean energy sources. You will manage energy certification and the application of building regulations, ensuring compliance and sustainability of projects. You will drive innovation and efficiency in any organization.

Who is it addressed to?

Aimed at professionals in the energy sector, engineering and architecture who seek high-level specialization in the management of energy projects and the integration of renewable sources. If you work in construction, chemistry, physics or environmental sciences and want to delve deeper into the energy transition, this program offers you a strategic vision. It is also ideal for management personnel of energy companies and electromechanical installations who need to update their knowledge to lead the transformation of the sector. If your interest is to acquire a comprehensive understanding of the technical, legal and economic aspects to address energy audit projects and apply advanced technologies in buildings and facilities, this is your path.

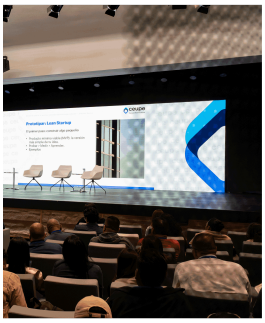
Official Character

This training is not included within the scope of official regulated training (Early Childhood Education, Primary Education, Secondary Education, Official Vocational Training FP, Baccalaureate, University Degree, Master University Officer and Doctorate). It is therefore a complementary and/or specialization training, aimed at the acquisition of certain competencies, skills or aptitudes of a professional nature, which can be assessed as merit in job boards and/or competitive examinations, always within the section of Complementary Training and/or Continuous Training. It is always essential to review the specific grading requirements of the specific public job boards to which we wish to apply.

Professional Outings

- Specialization in the energy management and renewable energy sector positions you to assume highly responsible roles. You will be able to lead teams as Director of Energy Efficiency Projects, designing and implementing innovative solutions in buildings and industry. You will develop as a Senior Consultant in Renewable Energy, advising on the integration of solar, geothermal and biomass systems in complex projects. You will also be able to assume the role of Energy Management Manager in large facilities or building portfolios, optimizing consumption and the carbon footprint. You will be a Specialist in sustainable HVAC and ACS Systems, key to the modernization of infrastructures. Furthermore, the ability to carry out energy audits and certifications will open doors for you as a Senior Energy Auditor, evaluating and proposing improvements in accordance with current regulations. Your profile will be indispensable for energy services companies, specialized engineering and technical departments of large corporations seeking to promote the energy transition.







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

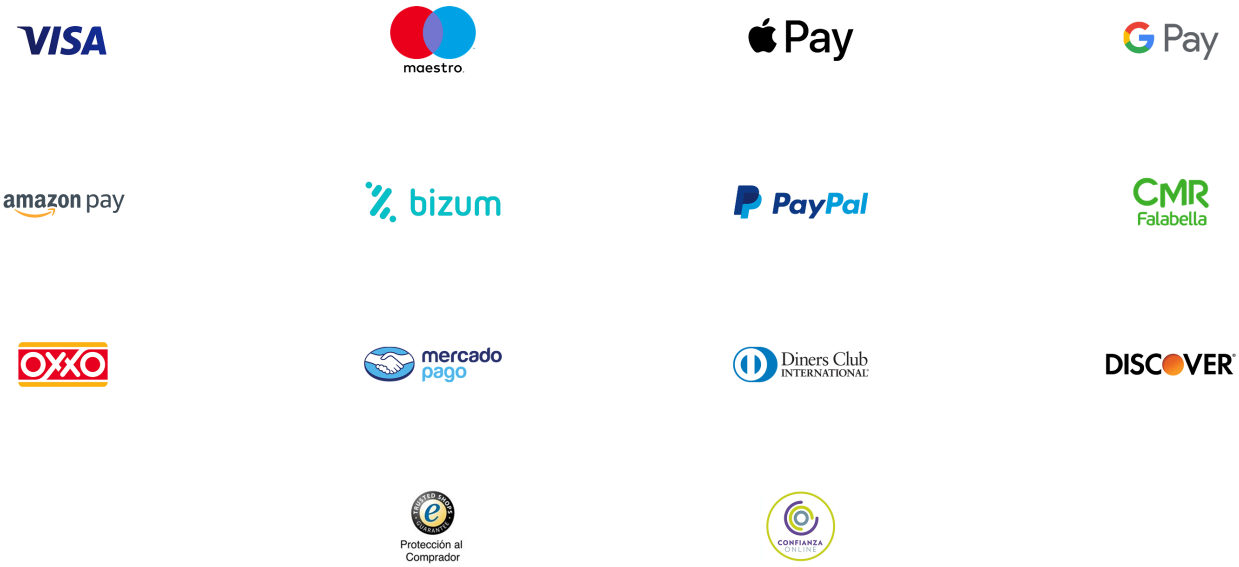
EDUCA EDTECH Group leads the digital revolution in education, promoting the continuous learning and technological transformation. The group is made up of recognized training institutions and its mission is to democratize access to education, promote the transfer of knowledge, technological development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

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