

Máster online 100%

Master in Energy Technology for Sustainable Development + 60 ECTS Credits

Structuralia

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Master in Energy Technology for Sustainable Development + 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 Technology for Sustainable Development offers in-depth specialization for professionals in the energy sector who seek to lead the transformation towards a sustainable model. You will address the global environmental and energy context, analyzing the dynamics that drive the adoption of renewable versus non-renewable energy technologies. This perspective will allow you to make informed decisions about the strategic direction of energy projects and policies, driving the global energy transition. You will delve into the technical characteristics of water and wind generation, understanding their applications and optimizations to maximize performance and efficiency. You will explore the technological context and the particularities of biomass energy, from its foundations to its most advanced technical characteristics. This knowledge will allow you to evaluate and select the most appropriate solutions for various energy production scenarios, considering their impact and viability. In addition, you will specialize in the design and management of renewable electricity self-consumption facilities. You will master the key aspects and the specific equipment necessary for these systems, always from the perspective of current events and the applicable regulatory context. You will develop a strategic vision to implement projects that not only optimize consumption, but also actively contribute to energy sustainability and operational efficiency. This program is designed for you to update your skills and lead innovation in the sector, anticipating

market demands and future regulations, consolidating your profile as an expert in sustainable energy.

Agenda

MODULE 1. CONTEXT AND TECHNOLOGY OF RENEWABLE ENERGY

1. DIDACTIC UNIT 1. ENVIRONMENTAL AND ENERGY CONTEXT

1. Kyoto Protocol and environmental problems
2. Environmental consequences
3. History and current energy context
4. World energy reserves

2. DIDACTIC UNIT 2. RENEWABLE AND NON-RENEWABLE ENERGY TECHNOLOGIES

1. Introduction to types of energy generation
2. Primary and final energies
3. Definition and types of energy vectors
4. Renewable and non-renewable sources
5. Non-renewable sources: nuclear and fossils
6. Solar renewable sources
7. Technological classification of renewable energies
8. Groups and subgroups of the different renewable technologies.

3. DIDACTIC UNIT 3. GENERATION TECHNOLOGIES WITH WATER AND WIND

1. Introduction to generation with water and wind
2. Energy technologies with water: hydroelectric and maritime
3. Wind energy technologies: onshore and offshore wind

4. DIDACTIC UNIT 4. TECHNOLOGICAL CONTEXT OF BIOMASS ENERGY

1. Introduction to biomass energy
2. Advantages and disadvantages of biomass among energy sources
3. Context and energy requirements of biomass at the European and national level

5. DIDACTIC UNIT 5. TECHNICAL CHARACTERISTICS OF BIOMASS TECHNOLOGIES

1. Classification of the different types of biomass
2. Characteristics of the different types of biomass
3. Energy conversion with thermochemical and biochemical methods
4. Energy forms: heat, biofuel, electricity generation and cogeneration
5. Applications and boilers: practical case
6. Economic aspects of biomass conversion
7. Biofuels: biodiesel and bioethanol

MODULE 2. ELECTRICAL SELF-CONSUMPTION INSTALLATIONS WITH RENEWABLE ENERGY

1. DIDACTIC UNIT 1. KEY ASPECTS AND SPECIFIC EQUIPMENT OF SELF-CONSUMPTION

1. The electricity market. Electric pool, operation and invoice terms

2. Distribution of electrical energy
3. Centralized and distributed electricity generation
4. Technical characteristics of distributed generation networks.
5. Smart energy and communication microgrids. Near or distant future?
6. Energy self-consumption. Concept, advantages and possibilities
7. Network parity
8. Types of self-consumption
9. Load management and monitoring equipment
10. Measurement and control equipment. Unidirectional and bidirectional counters

2. DIDACTIC UNIT 2. CURRENT CURRENT AND REGULATORY CONTEXT OF SELF-CONSUMPTION

1. Self-consumption by net and instantaneous balance. Problems, solutions and situation
2. European political framework
3. National regulatory framework for self-consumption
4. Procedure for connecting renewable installations to the low voltage network
5. Phases and stages to request the connection of renewable installations of any power
6. Procedure for legalization of self-consumption facilities
7. Economic remuneration of the injected renewable energy

3. DIDACTIC UNIT 3. SCHEMES OF SELF-CONSUMPTION INSTALLATIONS. ITC-40 OF THE REBT ON LOW VOLTAGE GENERATING INSTALLATIONS

1. Technical characteristics and types of low voltage generating installations. ITC-BT-40.
2. General conditions
3. Conditions for connection. Types of self-consumption schemes
4. Scheme of isolated facilities. Type A.
5. Diagrams of type C1 generating installation connected to the distribution and associated supply network
6. Diagrams of type C1 generating installation connected to the internal network and associated supply
7. Diagrams of type C2 generating installation with associated supply

4. DIDACTIC UNIT 4. TECHNICAL SPECIFICATIONS OF SELF-CONSUMPTION INSTALLATIONS

1. Maximum powers in low voltage interconnected plants
2. Maneuver and measurement equipment to be available at the interconnection point
3. Reactive energy control
4. Connection cables
5. waveform
6. Protections
7. Grounding installations
8. Start-up

5. DIDACTIC UNIT 5. ADVANCED ENERGY SYSTEMS OF PRODUCTION, COLLECTION AND ACCUMULATION

1. Cogeneration and absorption
2. heat pumps
3. Energy accumulation systems
4. Hydrogen fuel cells

5. Capture and accumulation of CO2

MODULE 3. ELECTRIC THERMOSOLAR POWER PLANTS

1. DIDACTIC UNIT 1. CURRENT AND FUTURE OF THERMOELECTRIC SOLAR ENERGY

1. Current context of thermoelectric power
2. Future of thermoelectric energy

2. DIDACTIC UNIT 2. THERMODYNAMICS AND THERMOELECTRIC SOLAR TECHNOLOGIES

1. Introduction to thermodynamics
2. Thermal machines and thermodynamic cycles for the production of electricity
3. Classification of concentrated solar thermal systems (STSC)
4. Concentration of solar radiation
5. Comparison of the different systems

3. DIDACTIC UNIT 3. PARABOLIC CHANNEL TECHNOLOGY I

1. Main components of parabolic trough collectors
2. Solar field configuration

4. DIDACTIC UNIT 4. PARABOLIC CHANNEL TECHNOLOGY II

1. The power block
2. Electrical, control and auxiliary system
3. Angle of incidence of a parabolic trough collector
4. Energy balance of the parabolic trough collector

5. DIDACTIC UNIT 5. CENTRAL TOWER TECHNOLOGY

1. Components
2. Central Tower Technology Overview
3. Energy balance

6. DIDACTIC UNIT 6. PARABOLIC DISK AND FRESNEL CONCENTRATOR TECHNOLOGIES

1. Parabolic dish technology
2. Fresnel concentrator technology

7. DIDACTIC UNIT 7. HYBRIDIZATION AND STORAGE

1. Hybridization
2. Storage

8. DIDACTIC UNIT 8. RESEARCH AND EXAMPLES OF CONFIGURATION AND OPERATION

1. R&D&I development
2. Examples of plants in operation

9. DIDACTIC UNIT 9. MAINTENANCE, INVESTMENT AND ENVIRONMENTAL BENEFITS

1. Maintenance. Failures and consequences
2. Investment structure
3. Benefits and environmental impact

MODULE 4. HYDROGEN AS AN ENERGY VECTOR

1. DIDACTIC UNIT 1. ENERGY AND HYDROGEN

1. History of hydrogen
2. What is hydrogen?
3. Current electrical and energy matrix
4. Hydrogen as an energy vector
5. Outlook for the Hydrogen Roadmap

2. DIDACTIC UNIT 2. HYDROGEN GENERATION AND STORAGE

1. PEM Electrolysis
2. Alkaline Electrolysis
3. SOEC and AEM electrolysis
4. Hydrogen storage
5. Hydrogen distribution

3. DIDACTIC UNIT 3. ELECTRICAL POWER GENERATION AND OTHER APPLICATIONS

1. fuel cells
2. PEM fuel cells
3. AT fuel cells
4. Hydrogen turbines and engines
5. Fuel cell vehicles

4. DIDACTIC UNIT 4. HYDROGEN INSTALLATIONS

1. refueling stations
2. Sizing of main equipment
3. Security considerations. Explosive atmospheres
4. Design of facilities related to hydrogen fuel cells
5. Installation calculation example.

MODULE 5. INSTRUMENTATION AND MONITORING OF ENERGY INSTALLATIONS

1. DIDACTIC UNIT 1. INSTRUMENTATION FUNDAMENTALS

1. Instrumentation Basics
2. Types of sensors and transducers
3. Data acquisition systems
4. Calibration of measuring equipment
5. Instrument maintenance and verification

2. DIDACTIC UNIT 2. MONITORING OF ENERGY VARIABLES

1. Electrical parameters: voltage, current, power
2. Thermal parameters: temperature, heat flow
3. Flow measurement in fluid systems
4. Monitoring in solar energy systems
5. Monitoring in wind energy systems

3. DIDACTIC UNIT 3. ENERGY CONTROL AND MANAGEMENT SYSTEMS

1. Energy Management Systems (EMS)
2. Programmable controllers (PLC) and their application in energy installations
3. Automation of energy systems
4. Energy demand management
5. Remote supervision of energy installations

4. DIDACTIC UNIT 4. COMMUNICATION AND DATA TRANSMISSION TECHNOLOGIES

1. Communication protocols in energy systems
2. Wireless sensor networks
3. SCADA technologies for monitoring and control
4. Cybersecurity in the monitoring of energy installations
5. Example of implementation of a communication system for monitoring

MODULE 6. ENVIRONMENTAL IMPACT ASSESSMENT OF ENERGY SYSTEMS

1. DIDACTIC UNIT 1. BASICS OF ENVIRONMENTAL IMPACT ASSESSMENT

1. Concepts and objectives of environmental impact assessment (EIA)
2. Legal and regulatory framework of the EIA
3. Environmental impact assessment methodologies
4. Key actors, procedures and phases of an EIA
5. Life cycle analysis (LCA)

2. DIDACTIC UNIT 2. ENVIRONMENTAL IMPACT ON DIFFERENT ENERGY SYSTEMS

1. Energy and typology of energy projects
2. Environmental effects of fossil fuels
3. Solar energy and its environmental impact
4. Wind energy and its environmental impact
5. Hydroelectric energy and its environmental impact

3. DIDACTIC UNIT 3. EVALUATION AND MITIGATION TECHNIQUES OF ENVIRONMENTAL IMPACTS

1. Qualitative and quantitative environmental impact assessment techniques
2. Environmental simulation tests and models
3. Key environmental indicators
4. Environmental mitigation measures
5. Compensatory and reparative measures

4. DIDACTIC UNIT 4. PRACTICAL CASES OF ENVIRONMENTAL ASSESSMENT

1. Environmental impact assessment of solar parks
2. Environmental impact assessment of wind energy projects

3. Environmental impact assessment in energy generation projects: biomass
4. Impact analysis on large linear energy infrastructures: power lines
5. Compendium of good practices in the environmental management of energy projects

MODULE 7. 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 8. BUILDING CERTIFICATION TOOLS

1. DIDACTIC UNIT 1. INTRODUCTION. LEED 1

1. Session 1: Introduction to sustainable building
2. Session 2: Evaluation and certification systems
3. Session 3: LEED Methodology
4. Session 4: Certification systems
5. Session 5: Performance assessment. ARC

2. DIDACTIC UNIT 2. LEED 2

1. Session 1: READ OM. Categories I
2. Session2: LEED OM. Categories II
3. Session 3: LEED BD+C. Categories I
4. Session 4: LEED BD+C. Categories II

5. Session 5: LEED, application examples

3. DIDACTIC UNIT 3. BREEAM

1. Session 1: BREEAM Methodology
2. Session 2: Certification schemes
3. Session 3: BREEAM New Construction. Categories I
4. Session 4: BREEAM New Construction. Categories II
5. Session 5: BREEAM ES, application examples

4. DIDACTIC UNIT 4. GREEN

1. Session 1: GREEN Methodology
2. Session 2: Certification Tools
3. Session 3: GREEN Equipment. Categories I
4. Session 4: GREEN Equipment. Categories II
5. Session 5: GREEN, application examples.

MODULE 9. FINAL PROJECT

Qualification

University Degree in Master of Lifelong Training in Energy Technology for Sustainable Development issued by the Antonio de Nebrija University with 60 ECTS University Credits. Teachings not leading to obtaining an official qualification

Objectives

- • Integrate the global context of energy and the environment into the strategy of sustainable projects. • Evaluate renewable and conventional energy generation technologies to optimize their application in large-scale initiatives. • Design efficient electricity production systems based on water and wind resources. • Manage the implementation of biomass technologies, from its context to its technical specifications, for sustainable development. • Lead electrical self-consumption projects with renewable sources, guaranteeing compliance with applicable regulations. • Implement advanced systems and specific equipment to optimize the efficiency and integration of self-consumption facilities. • Substantiate the technical and economic feasibility of renewable energy projects, considering their complete life cycle.

What does it prepare you for?

This program prepares you to lead the energy transformation, equipping you with the advanced skills necessary to address the global challenges of the sector. The Master in Energy Technology for Sustainable Development trains professionals in the management of renewable energy projects, enabling you to direct the global energy transformation. You will develop a strategic vision that will allow you to design and implement large-scale renewable energy projects, optimizing generation with water, wind and biomass. You will learn to manage electrical self-consumption installations, from their conception to their commissioning, ensuring regulatory compliance. You will delve into hydrogen as an energy vector, exploring its applications and technical viability. In addition, you will be able to evaluate the environmental impact of energy initiatives and apply energy certification criteria in buildings, integrating sustainability in each phase of the project's life cycle. You will make strategic decisions based on deep technological and regulatory knowledge.

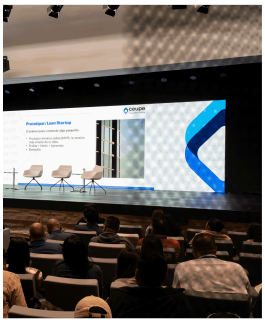
Who is it addressed to?

This program is designed for energy sector professionals, including engineers, consultants and project managers, seeking high-level specialization. If you work in the field of energy and are interested in updating your knowledge in renewable technologies, electrical self-consumption and the potential of hydrogen, this master's degree is for you. It is ideal for those who want to lead the transformation towards a more sustainable model, integrating the evaluation of the environmental impact of energy and applying energy certifications in buildings in their projects. You are looking for a strategic vision that allows you to make informed decisions and advance your career, driving innovation in your organization and actively contributing to energy sustainability.

Professional Outings

- Specialization in energy technology for sustainable development positions you to assume highly responsible roles in the energy transition. You will be able to lead teams as Renewable Energy Project Director, designing and implementing innovative solutions in generation with water, wind and biomass. You will develop the skills to work as a Senior Energy Efficiency Consultant, advising organizations on the optimization of their self-consumption facilities and the integration of advanced systems. You will also be able to assume the role of Business Development Manager in the field of hydrogen as an energy vector, exploring new applications and markets. Your profile will be key for the environmental impact assessment and energy certification, allowing you to assume the role of Sustainability and Regulatory Compliance Specialist. This training prepares you to direct the energy strategy in companies, public organizations or as an independent consultant, promoting innovation and sustainability in the sector.







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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Meet PHIA, your personalized learning assistant

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

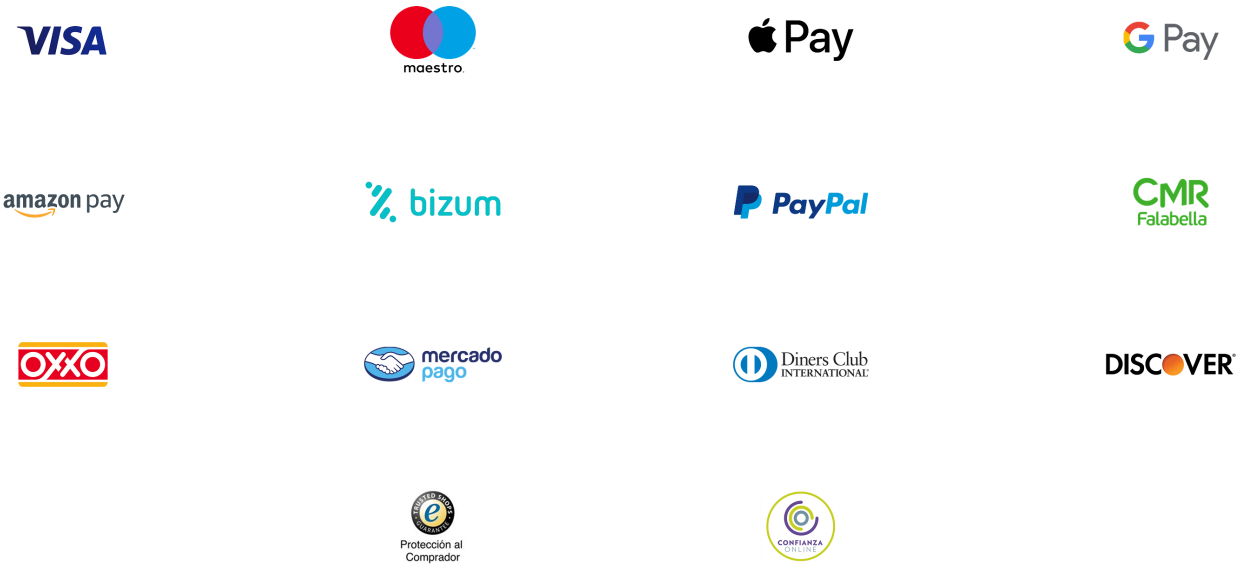
EDUCA EDTECH Group leads the digital revolution in education, promoting the continuous learning and technological transformation. The group is made up of recognized training institutions and its mission is to democratize access to education, promote the transfer of knowledge, technological development 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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20%
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GROUP Scholarship

20%
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Large Family Scholarship