Structuralia
Engineering eLearning

UNIVERSIDAD
NEBRIJA

Master´s Degree in Energy Efficiency and Renewable Energies + 60 ECTS Credits





Choose to learn at school
leader in online training

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ABOUT STRUCTURALIA

Structuralia is an online educational institution offering highly specialized postgraduate programs in engineering, infrastructure, construction, energy, building, digital transformation, and new technologies. Since our founding in 2001, we have been committed to providing quality training for the professional development of **engineers, architects, and STEM professionals.**

We provide a platform where you can acquire new skills and enhance your knowledge without being limited by time or location. Our methodology ensures an engaging, interactive, and **supportive educational experience,** equipping our students to meet future challenges in their respective fields of work.

More than **20** years of experience

Over **200k** student have learnt with us

More than **90** nationalities among our students



Specialize to
advance your career

STRUCTURALIA ALLIANCE AND NEBRIJA UNIVERSITY

Structuralia and the University of Nebrija successfully consolidate a strategic partnership. Thus, the collaboration between Structuralia and the University of Nebrija promotes a collaborative, innovative and accessible approach towards learning that is adapted to the individual needs of students.

The two institutions prioritize practical and flexible learning, adapted to the demands of today's working world, and which promotes the personal and professional development of each student. The purpose is to acquire new knowledge in a dynamic and didactic way, which facilitates its retention and contributes to developing the necessary skills to be ready to take part in a society in constant and rapid transformation.

Structuralia and the University of Nebrija have set as their main objective the democratization of education to bring it to even the most remote areas and taking advantage of the latest technological innovations. In addition, they have a team of highly specialized teachers and learning platforms that incorporate cutting-edge educational technology to provide academic support throughout the entire educational process.



STRUCTURALIA RANKINGS

Structuralia has achieved the recognition of different national and international rankings, thanks to its commitment to **democratize education** and bet on educational innovation to **achieve excellence.**

For the elaboration of these rankings, **indicators** such as online and offline reputation, the quality of the institution, social responsibility, educational innovation or the profile of professionals are used.















QS, seal of academic excellence

Structuralia: 5 stars in online education

BY EDUCA EDTECH

Structuralia is a brand endorsed by **EDUCA EDTECH Group,** which is composed of a group of experienced and recognized **educational institutions of online training.** All the entities that make it up share the mission of **democratizing access to education** and are committed to knowledge transfer, technological development and research.

EDUCA EDTECH Group

ONLINE EDUCATION

EUROINNOVA INTERNATIONAL ONLINE EDUCATION

inesem business school

INEAF BUSINESS SCHOOL

red educa.net

inesalud

EDU SPORT

EDUCA business school

ESIBE ESCUELA IBEROAMERICANA DE POSTGRADO

Educa.Pro

ceupe European Business School

UDAVINCI

CAPMAN testing solutions

Structuralia Engineering eLearning

UNIMIAMI International University of Miami

Educa PHAROS

LXP METHODOLOGY

The **EDUCA LXP** methodology enhances the learning experience by incorporating AI into e-learning processes. It utilizes highly customized predictive models based on the analysis of student interactions with their virtual environments.

EDUCA LXP is the outcome of **Research Results Transfer** from multiple interdisciplinary R&D+i projects, involving international universities dedicated to knowledge transfer, technological development and research.



1. Flexibility

100% online and flexible learning, allowing students to study where, when and how they want.



2. Accessibility

We believe in making education accessible to all, working to ensure that everyone has the opportunity to continue their learning journey.



3. Personalization

We offer customized learning paths tailored to each student's unique needs and preferences.



4. Accompaniment / Academic mentoring

Guidance and support. Our team of expert teachers provides academic guidance, advocating for educational quality and adapting to the needs of the ever-changing labor market.



5. Innovation

We are at the forefront of technological development, constantly evolving with AI-driven Learning Experience Platforms.



6. Educational excellence

Our didactic approach focuses on competence based learning, promoting practical and meaningful learning experiences to ensure professional development.



Programs

Our own university and official programs

WHY CHOOSIG STRUCTURALIA

1. Our Experience

- ✓ More than **20 years of experience**.
- ✓ More than **200.000 students** have already learnt in our virtual classrooms.
- ✓ More than **90 nationalities** among our student body.

2. Our Team

Currently, Structuralia has a team of **more than 550 professionals working in the STEM (Science, Technology, Engineering and Mathematics)**. Our staff is solidly framed in a structure that facilitates the highest quality in the attention to students.

3. Our Methodology



100% ONLINE

Study at your convenience, wherever you are. Access our virtual campus from any device.



LEARNING

We strive for a deep integration of new knowledge into your cognitive framework.



TEAM TEACHERS

Structuralia has a team of professionals to elevate your study experience with topquality education.



NOT BE ALONE

Receive continuous guidance from our tutoring team throughout your student journey.

4. AENOR Quality

- ✓ We are Collaboration Agency Nº99000000169 authorized by the Ministry of Employment and Social Security.
- ✓ Annual external audits are carried out to ensure the highest quality by AENOR.
- ✓ Our teaching processes are certified by AENOR under ISO 9001.

Master´s Degree in Energy Efficiency and Renewable Energies + 60 ECTS Credits



LENGHT
1500 horas



MODE
ONLINE



ASSISTANCE
PERSONALIZED



CREDIT
60 ECTS

Certificacion

Master´s Degree in Energy Efficiency and Renewable Energies with 60 ECTS Credits awarded by the Antonio de Nebrija University. Teaching not leading to an officially accredited qualification



Description

Energy models are changing, and the emerging initiatives are settling upon the pillars of energy efficiency and renewable energies. Therefore, this Master's program has been designed to integrate the main aspects of energy efficiency and the incorporation of renewable energies in engineering projects such as buildings and installations for fossil source replacement, or electric energy production and its direct injection into the net.

Goals

- The students will be able to achieve the following:
- Manage building/facility energy efficiency and renewable energy projects based on the comprehensive implementation of all the associated technical, legal and economic aspects.
- Learn how to approach and manage building energy efficiency, and renewable energy system integration projects.
- Learn and apply building energy management and renewable energy technologies.
- Conduct energy efficiency and renewable energy technical
- economic studies and viability analyses
- Learn the legal and administrative aspects associated with energy efficiency and renewable energy projects
- Calculate CO2 avoided emissions related to fossil fuel replacement projects according to official methodologies

What does it prepare you for?

This program is aimed at: energy sector professionals, architecture and engineering professionals, students in the fields of engineering, environmental science, architecture and construction, chemistry, physics, etc. It is also aimed at management staff from energy and electromechanical installation companies.

Who is the target audience?

The program has been subdivided into 2 major sections: The first section includes the key energy efficiency and renewable energy aspects as applied in construction and industry. The second section includes a technical-economic analysis of the main renewable energy sources such as solar, geothermal energy or biomass.

Job opportunities

- Project Engineer - Energy Consultant - Energy Technician - Energy and Environment Tech Consultant - Energy Manager - Energy Efficiency and Renewable Energy Business Manager

List of subjects

MODULE 1. BUILDING ENERGY MANAGEMENT

UNIT 1. THE ENERGY CONTEXT

1. Introduction
2. The International Energy Context
3. The Spanish Energy Context
4. European Regulatory Framework on Energy in Buildings
5. USA Regulatory Framework, ASHRAE Standards

UNIT 2. NEW CONSTRUCTION. CTE AND CEE

1. Introduction to CTE and Energy Certification
2. CTE Basic Requirements of Habitability
3. CTE Basic Requirements for Energy Saving
4. The Energy Certification
5. Recognized Documents for Energy Certification and Normative Relationship

UNIT 3. EXISTING BUILDINGS

1. The Energy Audit
2. Energy Audit Stage 1. Current Situation Analysis
3. Energy Audit Stage 2. Proposals and Economic Analysis
4. European Regulation. Series UNE-EN_16247-1,2,3,4.2012
5. Energy Audit ASHRAE Level II

UNIT 4. ENERGY CERTIFICATION OF EXISTING BUILDINGS

1. Existing Buildings. The Energy Certification
2. Designbuilder. Thermal Enclosure Definition
3. Designbuilder. Systems Definition
4. Designbuilder. Results and Improvement Measures
5. Case Study

MODULE 2. BUILDING ENERGY SYSTEMS. HVAC AND ACS

UNIT 1. HVAC SYSTEM WITH CONVENTIONAL EQUIPMENT

1. Introduction to HVAC System
2. Primary Loop
3. Secondary Loop
4. Generation of Heating and Cooling
5. Transport Fluid and Terminal Units

UNIT 2. AEROTHERMAL AND GEOTHERMAL SYSTEMS

1. Aerothermal Energy. Concept and characteristics
2. Aerothermal Energy. Design and calculation
3. Geothermal Energy. Concept and characteristics
4. Geothermal Energy. Design and calculation
5. Comparative Study

UNIT 3. VENTILATION

1. Introduction to Ventilation
2. Ventilation Systems in Residential Buildings
3. Ventilation in Tertiary Sector Buildings
4. Primary Air Handling Units
5. Ventilation Systems. Design and Calculation

UNIT 4. DHW

1. Introduction
2. Market Demand Assessment
3. Residential Buildings. Design and calculation
4. Tertiary Sector Buildings. Design and calculation
5. Case Study

MODULE 3. BUILDING ENERGY SYSTEMS. LIGHTING, AND BMS

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

UNIT 2. CONTROL AND MANAGEMENT SYSTEMS (I)

1. Introduction
2. Control Systems. Control Signals
3. Control Systems. Sensors
4. Control Systems. Actuators
5. Control Systems. Controllers

UNIT 3. CONTROL AND MANAGEMENT SYSTEMS (II)

1. Control Systems. Walkways or gateway
2. Control Systems. Measuring and Supervising
3. Management Systems
4. Advanced Management Systems
5. Systems Integration

UNIT 4. ENERGY MANAGEMENT AND MARKETS

1. ISO 50001 and Directive 2012/27/UE
2. Electricity Market, Tariff Scheme
3. CO2 Emission Trading. Rights Assignment and Financial Framework
4. Financial Management on Energy Projects
5. Energy Service Companies (ESCO)

MODULE 4. INTEGRATION OF RENEWABLE ENERGY IN BUILDINGS

UNIT 1. SOLAR THERMAL ENERGY

1. Principles of Solar Energy Conversion
2. Resource Assessment
3. Low-Temperature Solar Energy
4. Solar Air Conditioning
5. Concentrated Solar Power

UNIT 2. PHOTOVOLTAICS

1. Photovoltaic Effect
2. Components of a Photovoltaic System
3. Current Status of the Technology and the Market
4. Design and Calculation of Photovoltaic Systems
5. Standards and Regulations

UNIT 3. SMALL WIND TURBINE ENERGY

1. Resource Assessment
2. Description of the Technology
3. Dimensioning and Calculation of the Produced Energy
4. Small Wind Turbine Installations in Urban Environment
5. Economy and Environmental Impact of Wind Energy

UNIT 4. BIOMASS ENERGY

1. Biomass Use
2. Energy Use
3. Use in Construction
4. Systems and Equipment
5. District Headquarters

MODULE 5. ENERGY EFFICIENCY IN INDUSTRY SECTOR

UNIT 1. CURRENT ENERGY SITUATION

1. The Energy in Industry
2. The Importance of Energy Efficiency
3. Energy Legislation
4. Subsidies, Financing and Other Initiatives to Promote Energy Efficiency in the Industry
5. Successful Cases

UNIT 2. THE ENERGY MANAGER

1. The Position of Energy Manager. Responsibilities
2. Energy Service Companies (ESCO)
3. Standards Applicable to ESCOs
4. Energy Strategy
5. Successful Cases

UNIT 3. THE ENERGY AUDIT IN THE INDUSTRY

1. Basic Concepts
2. Methodology of the Energy Audit Process
3. Action Plans
4. Results. Energy Indicators
5. Successful Cases

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

1. Thermal and Electrical Systems
2. Heating, Ventilation and Air Conditioning
3. Lighting
4. Other Systems and Equipment of Energy Consumption
5. Energy Efficiency Solutions in the Industry

MODULE 6. PHOTOVOLTAIC SOLAR ENERGY

UNIT 1. THE SOLAR RESOURCE AND THE PHOTOVOLTAIC EFFECT

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

UNIT 2. PHOTOVOLTAIC SOLAR TECHNOLOGIES

1. Classification of PV solar technologies
2. Crystalline silicon technology
3. Thin-film panel technology (I)
4. Thin-film panel technology (II)
5. Concentrator photovoltaics

UNIT 3. ELECTRICAL ENERGY PRODUCED BY A PHOTOVOLTAIC POWER PLANT. THE PVSYST PROGRAM

1. Solar energy production. The PR concept
2. PVSYST. Site definition and meteorological basis
3. PVSYST. Component modeling (I)
4. PVSYST. Component modeling (II)
5. PVSYST. Energy simulation and results

UNIT 4. MAIN EQUIPMENT AND INFRASTRUCTURES

1. Photovoltaic self-consumption. PVSYST simulation program
2. Solar trackers and structures
3. Main electrical equipment
4. Medium voltage cables and electrical substation
5. Civil works

MODULE 7. RENEWABLE ENERGIES. BIODIESEL, BIOGAS, BIOMASS COMBUSTION, AND SOLAR THERMOELECTRIC POWER

UNIT 1. BIOMASS

1. Introduction to biomass
2. Biomass as an energy source
3. Characterization of biomass as an energy resource
4. Problems of the use of biomass
5. Biomass technologies and treatments

UNIT 2. BIOGAS

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

UNIT 3. BIOFUELS

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

UNIT 4. BIOMASS COMBUSTION

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

MODULE 8. THE ENERGY OF THE SMART CITY OF THE FUTURE

UNIT 1. INTRODUCTION. SMART CITY CONCEPT

1. Introduction and objectives
2. Smart cities
3. Some experiences of smart cities

4. Energy in cities
5. The consumer at the centre. Smart meters

UNIT 2. SUSTAINABLE MOBILITY

1. The need to decarbonise transport
2. Possible actions to decarbonise transport
3. The electric vehicle
4. The electric bus
5. New business models

UNIT 3. RENEWABLE DISTRIBUTED GENERATION

1. Overview of renewable distributed generation
2. Boosting distributed generation and self-consumption
3. Incorporation of self-consumption into the electricity system
4. Energy communities
5. Some experiences

UNIT 4. SMART GRIDS

1. Electricity distribution (I)
2. Electricity distribution (II)
3. Networks and energy transition
4. New tools. Acquiring flexibility
5. Smart grids

MODULE 9. WIND ENERGY

UNIT 1. PHYSICAL AND METEOROLOGICAL CONCEPTS

1. History of wind energy
2. Wind meteorology
3. The physics of wind resources
4. Site selection
5. Wind resource measurement campaign

UNIT 2. WIND TURBINE TECHNOLOGY AND WIND DATA ANALYSIS

1. Wind resource
2. Practical exercise. Wind resource descriptive statistical analysis. Windographer program
3. Wind turbines (I)
4. Wind turbines (II)
5. Wind turbines (III)

UNIT 3. MICROSITING STUDY THROUGH AN ELECTRIC POWER PRODUCTION COMPUTATIONAL MODEL

1. WASP program. Data analysis model (WASP climate analyst)
2. WASP program. Terrain topographic modeling (WASP map editor)

3. Exercise. Power curve and thrust coefficient
4. WASP program. Power simulation (I)
5. WASP program. Power simulation (II)

UNIT 4. WINDFARM DESIGN

1. Windfarm construction project
2. Windfarm electrical power facilities and installations
3. High-voltage electrical power substation
4. Overhead high-voltage power line
5. Offshore wind power

MODULE 10. MFP. MASTER´S DEGREE IN RENEWABLE TECHNOLOGIES IN POWER GENERATION

1. TRABAJO FINAL DE MÁSTER.

Did you find this information interesting?

If you still have questions, our academic advising team will be happy to answer them.

Ask us about our training method, our teachers, scholarships or even just get to know us.

Request information without commitment.

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