Structuralia
Engineering eLearning

UNIVERSIDAD
NEBRIJA

Master´s Degree in Sustainable Electricity Generation + 60 ECTS Credits





Choose to learn at school
leader in online training

INDICE

1 | About **Structuralia**

2 | **Alliance**

3 | **Rankings**

4 | By **EDUCA EDTECH Group**

5 | LXP **Methodology**

6 | **Why choosing** Structuralia?

7 | Trainning **program**

8 | **List of Subjects**

9 | **Contact**

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 Sustainable Electricity Generation + 60 ECTS Credits

LENGHT
1500 horas

MODE
ONLINE

ASSISTANCE
PERSONALIZED

CREDIT
60 ECTS

Certificacion

Master´s Degree in Sustainable Electricity Generation with 60 ECTS Credits awarded by the Antonio de Nebrija University. Teaching not leading to an officially accredited qualification



Description

The objective of the program is to impart technical, economic, environmental and project management knowledge for the sustainable generation of electricity through the use of renewable energies.

Goals

The goals of this program seek to enable the student to: - Understand the energy context in which the world moves and its dependence on fossil fuels, as well as the main policies for the transition from fossil to renewable energies. - Analyze traditional electricity generation technologies by using coal, natural gas, and nuclear energy - Learn the new electricity generation technologies through renewable resources: wind, solar, hydraulic, biomass, energy from the sea, etc. - Study hydrogen energy as a new energy vector and understand its importance in energy storage and transport - Learn the importance of smart grids, distributed generation, and electric mobility as elements that will transform and make the city of the future more sustainable. - Learn the management methodology applied to renewable energy projects - Design and implement a renewable energy project. - Learn work methodologies (including computer tools) that are currently applied by companies in energy related projects.

What does it prepare you for?

The following program is aimed at the following audiences: - Holders of engineering degrees - Holder of science degrees - Master and technical engineers - Technical architects and building engineers - Professionals from the sector with college education

Who is the target audience?

As a result, the student will be able to carry out the design and dimensioning of wind farms, photovoltaic solar plants, hydroelectric plants, biomass projects, and other renewable energy initiatives (e.g., Thermoelectric, geothermal, and energy from the sea). Likewise, knowledge on hydrogen energy, and on other renewable gasses (biofuels) will be provided, as well as on the infrastructure to be implemented in the cities of the future (e.g., Distributed generation, smart networks, electric mobility).

Job opportunities

This master’s degree seeks to open the doors to the sector of electric energy generation by means of renewable energy sources, and more specifically, to: - The implementation and management of renewable resource measurement campaigns - Renewable resource analyses (e.g., wind resource analysis) - The knowledge of renewable generation technologies, such as wind turbines, solar panels,

hydraulic turbines, etc. - The conceptual, or basic design of renewable energy facilities (e.g, wind farms, photovoltaic solar plants) - The management of renewable energy and hydrogen energy projects - The construction of wind farm facilities and photovoltaic solar plants - The management of distributed generation projects, smart grids, and sustainable mobility

List of subjects

MODULE 1. GLOBAL ENERGY CONTEXT

UNIT 1. ENERGY AND DEVELOPMENT

1. Global energy context
2. Climate change
3. Decarbonisation of the economy and energy transition
4. Climate neutrality. The Green Deal
5. Smart cities

UNIT 2. SUSTAINABLE DEVELOPMENT

1. Sustainable development goals
2. United nations climate summits. Kyoto protocol and Paris agreement
3. Clean Development Mechanisms (CDM) and Joint Implementation (JM)
4. Emissions trading
5. CO2 capture and usage

UNIT 3. THE ROLE OF RENEWABLE ENERGIES AND OTHER MAINTENANCE TECHNOLOGIES

1. Energy security. Energy policy of the European Union
2. Penetration of renewable energy and electrification by 2050
3. The importance of hydrogen
4. The batteries
5. Distributed generation

UNIT 4. OTHER VECTORS OF CHANGE

1. General aspects of energy efficiency (I)
2. General aspects of energy efficiency (II)
3. Energy efficiency in transport
4. Energy efficiency in buildings
5. Circular economy

MODULE 2. CONVENTIONAL HEAT GENERATION

UNIT 1. INTRODUCTION TO THERMODYNAMICS. FUELS. THE STEAM POWER PLANT

1. Introduction to thermodynamics
2. Fuels and combustion
3. The steam power plant (I). The regenerative Rankine cycle
4. The steam power plant (II). General arrangement. Main equipment
5. Types of steam power plants

UNIT 2. GAS TURBINES POWER PLANTS

1. The gas turbine. The Brayton cycle
2. Types of gas turbines. Parts of the gas turbine. Technologists
3. Simple cycle power plants
4. Combined cycle power plants
5. General arrangement of a combined cycle power plant. Components

UNIT 3. DIESEL ENGINE POWER PLANTS. SITUATION AND OUTLOOK OF CONVENTIONAL THERMAL GENERATION

1. The internal combustión engine. The Otto cycle and the Diesel cycle
2. The diesel engine. Types. Technologists
3. The engine power plant. Types and configurations
4. General arrangement and components
5. Situation and outlook of conventional thermal generation

UNIT 4. NUCLEAR ENERGY

1. Nuclear energy basic concepts
2. Nuclear technology fundamentals
3. Conventional nuclear power plants
4. Nuclear power plants safety and radiation protection
5. The role of nuclear energy in the transition to decarbonization

MODULE 3. HYDROELECTRIC POWER

UNIT 1. INTRODUCTION TO HYDROPOWER. DAMS AND RESERVOIRS

1. Introduction and general information on hydroelectric generation
2. Typology of hydroelectric power plants
3. Hydraulic resource assessment
4. Dams and weirs (I). Introduction and typology
5. Dams and weirs (II). Actions, landfills and drainage

UNIT 2. HYDRAULIC CIRCUITS

1. Intake works
2. Channels and pressure galleries
3. Penstocks
4. Gates and valves
5. Hydraulic circuit equipment

UNIT 3. HYDROELECTRIC TURBINES AND ELECTRICAL EQUIPMENT

1. Powerhouse and introduction to turbines
2. Field of application of turbines and action turbines
3. Reaction turbines
4. Turbine selection criteria and performance
5. Generators, regulation and control

UNIT 4. PUMPED-STORAGE, PROJECT DEVELOPMENT AND ENVIRONMENTAL CONSIDERATIONS

1. Pumped-storage power plants
2. Feasibility studies
3. Sizing example
4. Hydroelectric projects
5. Environmental evaluation. Environmental impact mitigation

MODULE 4. 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 5. HYDROGEN AS AN ENERGY VECTOR

UNIT 1. ENERGY AND HYDROGEN

1. The hystory of hydrogen
2. What is hydrogen?
3. Current electricity and energy matrix
4. Hydrogen as an energy carrier
5. Prospects for the hydrogen roadmap

UNIT 2. HYDROGEN GENERATION AND STORAGE

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

UNIT 3. POWER GENERATION AND OTHER APPLICATIONS

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

UNIT 4. HYDROGEN INSTALLATIONS

1. Refuelling stations
2. Sizing of main equipment
3. Safety considerations. Explosive atmospheres
4. Design of hydrogen and fuel cell installations
5. Examples of installation calculations

MODULE 6. ALTERNATIVE RENEWABLE ENERGIES. BIOETHANOL, 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 7. 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 8. DESIGN AND MANAGEMENT OF ENERGY PROJECTS

UNIT 1. PROJECT AND ITS ORGANIZATION

1. Renewable energy projects. Definition and type of projects
2. Project objectives
3. Different organizations and roles in the project

4. The project team. The project manager

UNIT 2. PROJECT DEVELOPMENT

1. Site search and land management
2. Acquisition of projects in the development phase
3. Project analysis. Detailed business plan
4. Project processing

UNIT 3. DEFINITION OF DETAIL AND PROPOSAL FOR APPROVAL

1. Project execution strategy (I)
2. Project execution strategy (II)
3. Bidding processes
4. Contracts
5. Risk management (I). Risk matrix
6. Risk management (II). Contingency estimation

UNIT 4. PROJECT CONSTRUCTION AND COMPLETION

1. Project planning
2. Project budget and economic control
3. Safety and environmental management
4. Procurement management and equipment manufacturing control
5. Construction and commissioning supervision
6. Completion of construction, contracts closing and transfer to operations organization

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 SUSTAINABLE ELECTRICITY GENERATION

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.

Find us here!

info@structuralia.com

www.structuralia.com

Follow us to stay updated!

España

inglaterra



Structuralia
Engineering eLearning



By
EDUCA EDTECH
Group