

# Postgraduate Diploma Energy and Energy Auditing





## Postgraduate Diploma Energy and Energy Auditing

- » Modality: online
- » Duration: 6 months
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtitute.com/in/engineering/postgraduate-diploma/postgraduate-diploma-energy-energy-auditing](http://www.techtitute.com/in/engineering/postgraduate-diploma/postgraduate-diploma-energy-energy-auditing)

# Index

01

Introduction

---

*p. 4*

02

Objectives

---

*p. 8*

03

Course Management

---

*p. 12*

04

Structure and Content

---

*p. 16*

05

Methodology

---

*p. 22*

06

Certificate

---

*p. 30*

01

# Introduction

Natural resources are not unlimited and, therefore, they must be consumed efficiently. Additionally, energy-saving allows benefits in the economy of the citizens, but, mainly, it provides benefits for the environment. All this makes it essential to carry out audits to control consumption. This program in Energy and Energy Auditing aims to train professionals in this field to improve their daily work and advance in the field of sustainability.

A

B

C

D

E

F



“

*Energy audits reveal problems in the facilities that, after being solved, can help to save energy”*

The Postgraduate Diploma in Energy and Energy Auditing addresses the complete range of issues involved in this field, both in the residential and tertiary sectors. Its study has a clear advantage over other programs that focus on specific blocks, which prevents the student from knowing the interrelationship with other areas included in the multidisciplinary field of Energy and Energy Auditing.

Cities behave as a single body of energy consumption and expenditure; in fact, these units are responsible for almost 70% of the world's energy consumption. Energy consumption is directly related to the amount of CO2 emissions. The highest emissions levels recorded are also related to life in cities.

Improper energy consumption puts pressure on the quality of other factors, such as the reduction of freshwater reservoirs, air quality, and increased waste. In the cities, many have found their home, their personal development and their lifestyle. Therefore, an in-depth study of energy in building construction will help the student to understand the responsibility of efficient use.

On the other hand, this program places special emphasis on energy audits, since it is impossible to improve that which is not known. Conducting an energy audit is the first step to achieve energy savings in the building and improve towards a clear goal of sustainability. And it is even more relevant when the use of the building is intensive, such as in tertiary buildings.

In this way, students will specialize in the distinction between energy diagnosis, energy audit and energy audit for the provision of a contract through an Energy Service Company (ESCO), and will define the skills of the energy auditor, as well as their attributes, knowledge, skills that they must have informing the different types of accreditations that exist.

Additionally, with this Postgraduate Diploma, the student will achieve an exhaustive knowledge of all the renewable energies and the uses that, in their development, can be currently applied in the building industry. In addition, as it is a 100% online Postgraduate Diploma, the student is not constrained by fixed timetables or the need to move to another physical location, but can access the contents at any time of the day, balancing their professional or personal life with their academic life.

This **Postgraduate Diploma in Energy and Energy Auditing** contains the most complete and up-to-date academic program on the market. The most important features include:

- ◆ The development of practical cases presented by experts in Energy and Energy Auditing
- ◆ The graphic, schematic, and practical contents with which they are created provide scientific and practical information on the disciplines that are essential for professional development
- ◆ Practical exercises where the self-assessment process can be carried out to improve learning
- ◆ Its special emphasis on innovative methodologies in Energy and Energy Auditing
- ◆ Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection work
- ◆ Content that is accessible from any fixed or portable device with an Internet connection



*Do not miss the opportunity to take with us this Postgraduate Diploma in Energy and Energy Auditing. It's the perfect opportunity to advance your career"*

“

*This Postgraduate Diploma is the best investment you can make when selecting a refresher program to expand your existing knowledge of Energy and Energy Auditing”*

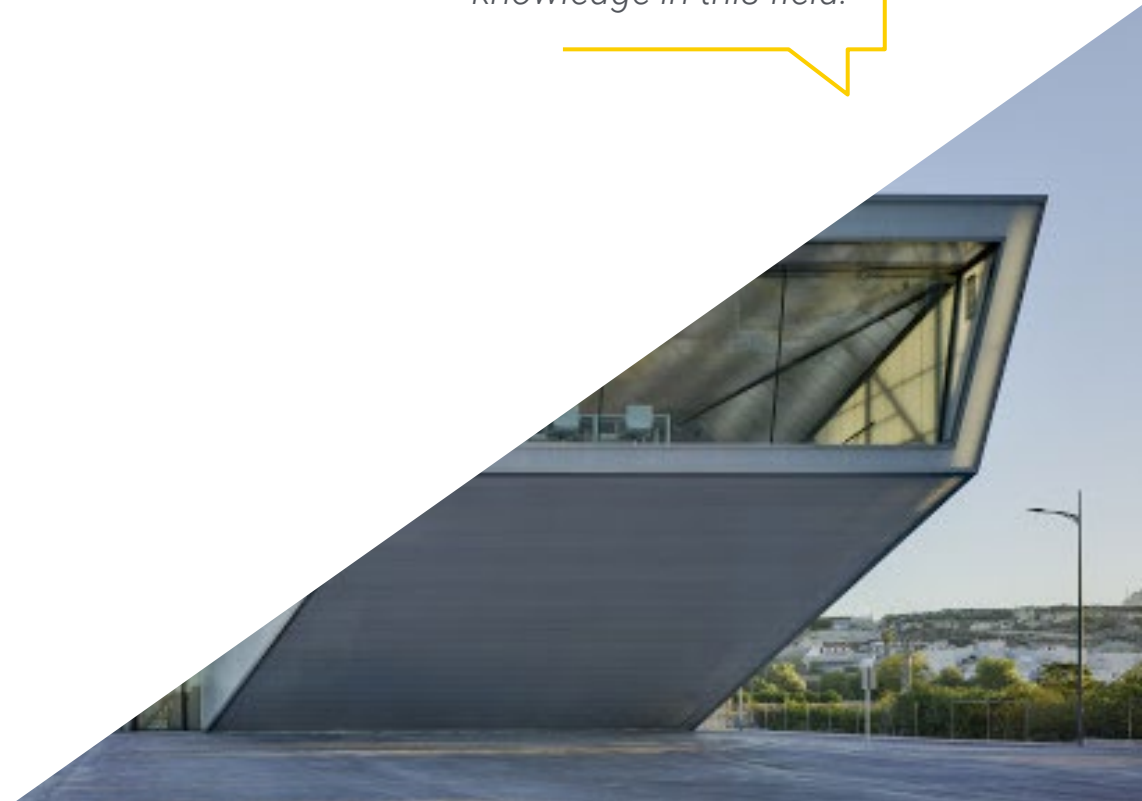
Its teaching staff includes professionals belonging to the field of construction, who bring to this program the experience of their work, as well as recognized specialists from leading companies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide immersive learning programmed to train in real situations.

This program is designed around Problem-Based Learning, whereby the professional must try to solve the different professional practice situations that arise throughout the program. For this purpose, the professional will be assisted by an innovative interactive video system created by renowned experts in Energy and Energy Auditing with extensive experience.

*This program comes with the best teaching material, providing you with a contextual approach that will facilitate your learning.*

*This 100% online Postgraduate Diploma will allow you to balance your studies with your professional work while expanding your knowledge in this field.*





# 02 Objectives

The Postgraduate Diploma in Energy and Energy Auditing is designed to facilitate the performance of the professionals in this field to enable them to master the main developments in this area of building construction.







“

*This is the best option to learn  
about the latest advances in  
Energy and Energy Auditing”*



## General Objectives

---

- ◆ Understand the impact of a city's energy consumption and the major elements that make it function, the buildings
- ◆ Analyze energy consumption and demand in depth, as these are the key determinants of a building's energy comfort
- ◆ Prepare the student to perform energy audits in accordance with EN 16247-2, provide energy services and energy certification to establish improvement measures to increase energy savings and sustainability in buildings
- ◆ Carry out an exhaustive analysis on the technique of each of the renewable energies. This will allow the student to have the ability and vision to design the best options for choosing an energy source in terms of available resources
- ◆ Internalize and expand on self-consumption, as well as the advantages of its application in buildings



*Take the step to get up to date on the latest developments in Energy and Energy Auditing”*







## Specific Objectives

---

### Module 1. Energy in the Construction of Buildings

- ◆ Gain insight into energy in cities
- ◆ Identify the importance of a building's energy performance
- ◆ Deepen the differences between energy consumption and energy demand
- ◆ Analyze in detail the importance of energy comfort and liveability

### Module 2. Energy Audits and Certification

- ◆ Recognize the type of work to be developed depending on the objectives set by the client to recognize the need to perform an energy audit
- ◆ Perform an energy audit according to EN 16247-2 to establish an action protocol to determine the initial situation and to propose energy saving options
- ◆ Analyze the provision of energy services to know each of their characteristics in defining energy service contracts
- ◆ Perform energy certification on buildings to determine the initial energy rating and define improvement options according to standards

### Module 3. Renewable Energies

- ◆ Deal in detail with the evolution of renewable energies up to their current applications
- ◆ Carry out exhaustive studies of applying these energies in today's construction
- ◆ Internalize and expand on self-consumption, as well as the advantages of its application in buildings

03

# Course Management

In our university we have professionals specialized in each area of study, who pour their expertise into our specialization courses.







“

*Our university employs the best professionals in all areas who share their knowledge to help you”*

## Management



### Mr. Nieto-Sandoval González- Nicolás, David

- Industrial Technical Engineer by the E.U.P. of Málaga
- Industrial Engineer from E.T.S.I.I
- Master's Degree in Integral Management of Quality, Environment and Health and Safety at Work from the University of the Balearic Islands
- He has been working for more than 11 years, both for companies and independently, for clients in the private agri-food industrial sector and the institutional sector, as a consultant in engineering, project manager, energy saving and circularity in organizations
- Professor certified by the EOI in the areas of industry, entrepreneurship, human resources, energy, new technologies and technological innovation
- Trainer for the European INDUCE project
- Trainer at institutions such as COGITI or COIIM

## Professors

### Ms. Peña Serrano, Ana Belén

- ♦ Technical Engineer in Topography from the Polytechnic University of Madrid
- ♦ Master's Degree in Renewable Energies from San Pablo CEU University
- ♦ Postgraduate Certificate in Geological Cartography from Universidad Nacional de Educación a Distancia (National University of Distance Education)
- ♦ Postgraduate Certificate in Building Energy Certification from Fundación Laboral de la Construcción
- ♦ Her experience covers several sectors from working on site, to managing people in human resources
- ♦ She collaborates in different scientific communication projects, directing the dissemination in different media in the field of energy

- ♦ Member of the work management team for the Master's Degree in Environmental and Energy Management in Organizations at the International University of La Rioja

### Mr. González Cano, José Luis

- ♦ Degree in Optics and Optometry from the Complutense University of Madrid
- ♦ Lighting Designer He collaborates with companies in the lighting sector in consulting, training, lighting technology projects and implementation of ISO 9001:2015 quality systems (internal auditor)
- ♦ He is a teacher for Vocational Training in electronic systems, telematics (CISCO certified instructor), radio communications, IoT
- ♦ Member of the Professional Association of Lighting Designers (Technical Consultant) and member of the Spanish Lighting Committee, who participates in working groups on LED technology



“

*Train in the world's leading  
private online university"*

04

# Structure and Content

The structure of the contents has been designed by the best professionals in the field of sustainability and energy-saving in building construction, with extensive experience and recognized prestige in the profession.







“

*We have the most complete and up-to-date program on the market. We strive for excellence and for you to achieve it too”*

## Module 1. Energy in the Construction of Buildings

- 1.1. Energy in Cities
  - 1.1.1. City Energy Behavior
  - 1.1.2. Sustainable Development Goals
  - 1.1.3. ODS 11 - Sustainable Citizens and Communities
- 1.2. Less Consumption or Cleaner Energy
  - 1.2.1. The Social Awareness of Clean Energies
  - 1.2.2. Social Responsibility in Energy Usage
  - 1.2.3. Greater Energy Need
- 1.3. Smart Cities and Buildings
  - 1.3.1. Smart Buildings
  - 1.3.2. Current Situation of Smart Buildings
  - 1.3.3. Smart Building Examples
- 1.4. Energy Consumption
  - 1.4.1. Building Energy Consumption
  - 1.4.2. Measuring Energy Consumption
  - 1.4.3. Knowing Our Consumption
- 1.5. Energy Demand
  - 1.5.1. Building Energy Demand
  - 1.5.2. Calculating Energy Demand
  - 1.5.3. Managing Energy Demand
- 1.6. Efficient Usage of Energy
  - 1.6.1. Responsibility in Energy Usage
  - 1.6.2. Knowing Our Energy System
- 1.7. Energetic Liveability
  - 1.7.1. Energy Liveability as a Key Aspect
  - 1.7.2. Factors Affecting Building Energetic Liveability
- 1.8. Thermal Comfort
  - 1.8.1. The Importance of Thermal Comfort
  - 1.8.2. The Need for Thermal Comfort
- 1.9. Energy Poverty
  - 1.9.1. Energy Dependence
  - 1.9.2. Current Situation







- 1.10. Solar Radiation. Climate Zones
  - 1.10.1. Solar Radiation
  - 1.10.2. Hourly Solar Radiation
  - 1.10.3. Effects of Solar Radiation
  - 1.10.4. Climate Zones
  - 1.10.5. The Importance of the Geographic Location of a Building

## Module 2. Energy Audits and Certification

- 2.1. Energy Audits
  - 2.1.1. Energy Diagnostics
  - 2.1.2. Energy Audits
  - 2.1.3. ESE Energy Audits
- 2.2. Competencies of an Energy Auditor
  - 2.2.1. Personal Attributes
  - 2.2.2. Knowledge and Skills
  - 2.2.3. Skill Acquisition, Maintenance and Improvement
  - 2.2.4. Certifications
  - 2.2.5. List of Energy Service Providers
- 2.3. Energy Audits in Building Construction: UNE-EN 16247-2
  - 2.3.1. Preliminary Contact
  - 2.3.2. Field Work
  - 2.3.3. Analysis
  - 2.3.4. Report
  - 2.3.5. Final Presentation
- 2.4. Auditing Measurement Tools
  - 2.4.1. Network Analyzer and Clamp Ammeters
  - 2.4.2. Luxmeter
  - 2.4.3. Thermohygrometer
  - 2.4.4. Anemometer
  - 2.4.5. Combustion Analyser
  - 2.4.6. Thermographic Camera
  - 2.4.7. Transmittance Meter

- 2.5. Investment Analysis
  - 2.5.1. Preliminary Considerations
  - 2.5.2. Noise Assessment Criteria
  - 2.5.3. Cost Study
  - 2.5.7. Grants and Subsidies
  - 2.5.8. Recovery Period
  - 2.5.9. Optimal Profitability Level
- 2.6. Managing Contracts with Energy Services Companies
  - 2.6.1. Energy Efficiency Services: UNE-EN 15900
  - 2.6.2. First Service: Energy Management
  - 2.6.3. Second Service: Maintenance
  - 2.6.4. Third Service: Total Guarantee
  - 2.6.5. Fourth Service: Facility Improvement and Renovation
  - 2.6.6. Fifth Service: Savings and Renewable Energy Investments
- 2.7. Certification Programs: HULC
  - 2.7.1. HULC Program
  - 2.7.2. Data Prior to Calculation
  - 2.7.3. Practical Case Example: Residential Case
  - 2.7.4. Practical Case Example: Small Tertiary Case
  - 2.7.5. Practical Case Example: Large Tertiary
- 2.8. Certification Programs: CE3X
  - 2.8.1. CE3X Program
  - 2.8.2. Data Prior to Calculation
  - 2.8.3. Practical Case Example: Residential Case
  - 2.8.4. Practical Case Example: Small Tertiary Case
  - 2.8.5. Practical Case Example: Large Tertiary
- 2.9. Certification Programs: CERMA
  - 2.9.1. CERMA Program
  - 2.9.2. Data Prior to Calculation
  - 2.9.3. Practical Case Example: New Construction
  - 2.9.4. Practical Case Example: Existing Buildings
- 2.10. Certification Programs: Others
  - 2.10.1. Variety in Energy Calculation Programs Use
  - 2.10.2. Other Certification Programs

## Module 3. Renewable Energies

- 3.1. Thermal Solar Power
  - 3.1.1. Thermal Solar Power Scope
  - 3.1.2. Thermal Solar Power Systems
  - 3.1.3. Thermal Solar Power Today
  - 3.1.4. Thermal Solar Power Use in Buildings
  - 3.1.5. Advantages and Disadvantages
- 3.2. Photovoltaic Solar Power
  - 3.2.1. Photovoltaic Solar Power Evolution
  - 3.2.2. Photovoltaic Solar Power Today
  - 3.2.3. Photovoltaic Solar Power Use in Buildings
  - 3.2.4. Advantages and Disadvantages
- 3.3. Microhydraulic Power
  - 3.3.1. Hydraulic Power in Buildings
  - 3.3.2. Hydraulic Power and Microhydraulic Power Today
  - 3.3.3. Practical Applications of Hydraulic Power
  - 3.3.4. Advantages and Disadvantages
- 3.4. Micro-Wind Power
  - 3.4.1. Wind and Micro-Wind Power
  - 3.4.2. Update on Wind and Micro-Wind Power
  - 3.4.3. Practical Applications of Wind Power
  - 3.4.4. Advantages and Disadvantages
- 3.5. Biomass
  - 3.5.1. Biomass as Renewable Fuel
  - 3.5.2. Types of Biomass Fuel
  - 3.5.3. Oil-Fired Heat Production Systems
  - 3.5.4. Advantages and Disadvantages
- 3.6. Geothermal
  - 3.6.1. Geothermal Energy
  - 3.6.2. Geothermal Power Systems Today
  - 3.6.3. Advantages and Disadvantages





- 3.7. Aerothermal Power
  - 3.7.1. Aerothermal Power in Buildings
  - 3.7.2. Aerothermal Power Systems Today
  - 3.7.3. Advantages and Disadvantages
- 3.8. Cogeneration Systems
  - 3.8.1. Cogeneration
  - 3.8.2. Cogeneration Systems in Homes and Buildings
  - 3.8.3. Advantages and Disadvantages
- 3.9. Biogas in Building
  - 3.9.1. Potentialities
  - 3.9.2. Biodigesters
  - 3.9.3. Integration
- 3.10. Self-Consumption
  - 3.10.1. Self-Consumption Application
  - 3.10.2. Self-Consumption Benefits
  - 3.10.3. The Sector Today
  - 3.10.4. Self-Consumption Power Systems in Buildings

“ *This specialization will allow you to comfortably advance in your career* ”

# 05

# Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning.**

This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.





“

*Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"*

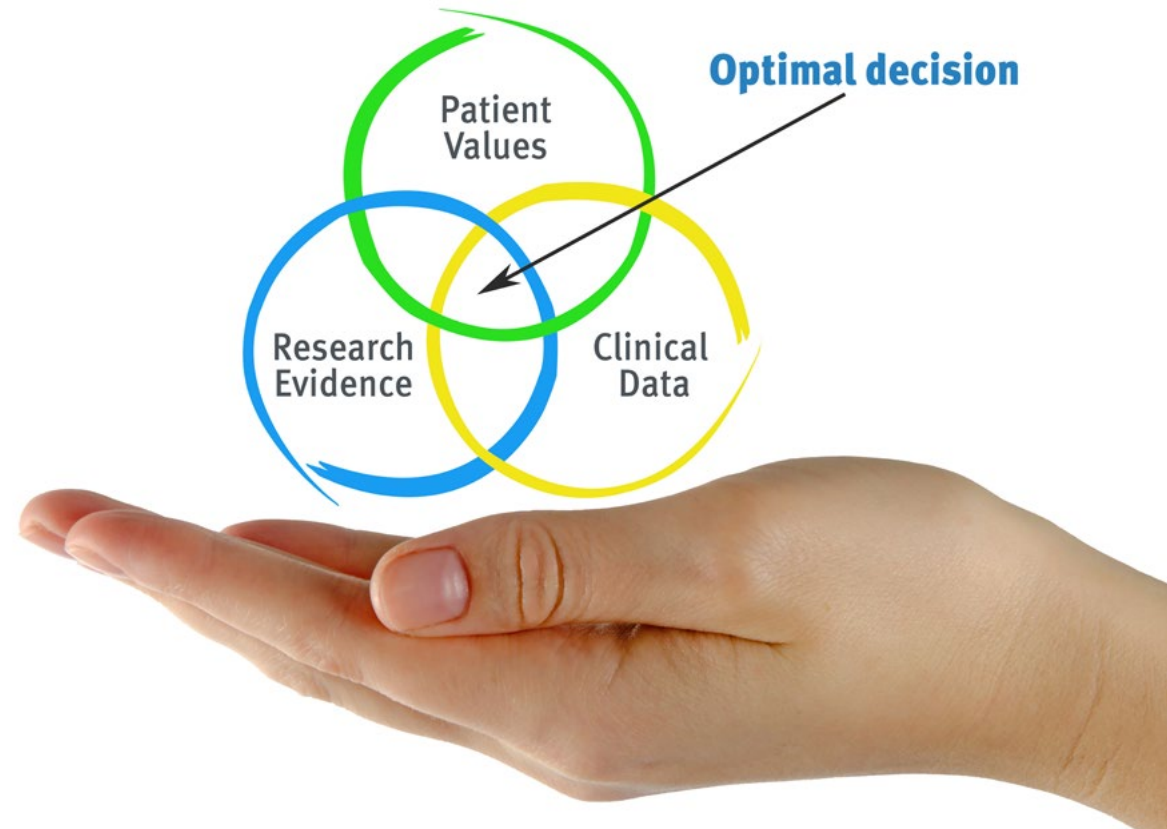


## Case Study to contextualize all content

Our program offers a revolutionary approach to developing skills and knowledge. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.



*At TECH, you will experience a learning methodology that is shaking the foundations of traditional universities around the world"*



*You will have access to a learning system based on repetition, with natural and progressive teaching throughout the entire syllabus.*





*The student will learn to solve complex situations in real business environments through collaborative activities and real cases.*

### A learning method that is different and innovative

This TECH program is an intensive educational program, created from scratch, which presents the most demanding challenges and decisions in this field, both nationally and internationally. This methodology promotes personal and professional growth, representing a significant step towards success. The case method, a technique that lays the foundation for this content, ensures that the most current economic, social and professional reality is taken into account.

“*Our program prepares you to face new challenges in uncertain environments and achieve success in your career”*

The case method is the most widely used learning system in the best faculties in the world. The case method was developed in 1912 so that law students would not only learn the law based on theoretical content. It consisted of presenting students with real-life, complex situations for them to make informed decisions and value judgments on how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

What should a professional do in a given situation? This is the question that you are presented with in the case method, an action-oriented learning method. Throughout the program, the studies will be presented with multiple real cases. They will have to combine all their knowledge and research, and argue and defend their ideas and decisions.

## Relearning Methodology

TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

*In 2019, we obtained the best learning results of all online universities in the world.*

At TECH, you will learn using a cutting-edge methodology designed to train the executives of the future. This method, at the forefront of international teaching, is called Relearning.

Our university is the only one in the world authorized to employ this successful method. In 2019, we managed to improve our students' overall satisfaction levels (teaching quality, quality of materials, course structure, objectives...) based on the best online university indicators.



In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically.

This methodology has trained more than 650,000 university graduates with unprecedented success in fields as diverse as biochemistry, genetics, surgery, international law, management skills, sports science, philosophy, law, engineering, journalism, history, and financial markets and instruments. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

*Relearning will allow you to learn with less effort and better performance, involving you more in your training, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation for success.*

From the latest scientific evidence in the field of neuroscience, not only do we know how to organize information, ideas, images and memories, but we know that the place and context where we have learned something is fundamental for us to be able to remember it and store it in the hippocampus, to retain it in our long-term memory.

In this way, and in what is called neurocognitive context-dependent e-learning, the different elements in our program are connected to the context where the individual carries out their professional activity.





This program offers the best educational material, prepared with professionals in mind:



### Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.



### Classes

There is scientific evidence suggesting that observing third-party experts can be useful.

Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.



### Practising Skills and Abilities

They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.



### Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.





#### Case Studies

Students will complete a selection of the best case studies chosen specifically for this program. Cases that are presented, analyzed, and supervised by the best specialists in the world.



#### Interactive Summaries

The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



#### Testing & Retesting

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.



06

# Certificate

The Postgraduate Diploma in Energy and Energy Auditing guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma issued by TECH Technological University.





“

*Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork"*

This **Postgraduate Certificate in Energy and Energy Auditing** contains the most complete and up-to-date program on the market.

After the student has passed the assessments, they will receive their corresponding Postgraduate Diploma issued by **TECH Technological University** via tracked delivery\*.

The certificate issued by **TECH Technological University** will reflect the qualification obtained in the Postgraduate Diploma, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Postgraduate Diploma in Energy and Energy Auditing**

Official N° of hours: **450 h.**



\*Apostille Convention. In the event that the student wishes to have their paper certificate issued with an apostille, TECH EDUCATION will make the necessary arrangements to obtain it, at an additional cost.

future

health confidence people

education information tutors

guarantee accreditation teaching

institutions technology learning

community commitment

personalized service innovation

knowledge present quality

online training

development language

virtual classroom

**tech** technological  
university

## Postgraduate Diploma Energy and Energy Auditing

- » Modality: online
- » Duration: 6 months
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online



# Postgraduate Diploma Energy and Energy Auditing

