

# Postgraduate Certificate Production and Generation of Electricity with Cogeneration Plants and Methodologies





## Postgraduate Certificate Production and Generation of Electricity with Cogeneration Plants and Methodologies

- » Modality: online
- » Duration: 6 weeks
- » Certificate: TECH Global University
- » Credits: 6 ECTS
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtitute.com/us/engineering/postgraduate-certificate/production-generation-electricity-cogeneration-plants-methodologies](http://www.techtitute.com/us/engineering/postgraduate-certificate/production-generation-electricity-cogeneration-plants-methodologies)

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# 01

# Introduction

This program analyzes the different types of cogeneration system technologies that currently exist and their future trends: with reciprocating engines, gas and steam turbines, and how they can be integrated with combined cycles. It also provides an in-depth breakdown of the operation of the different alternative engines that exist and their influence on the generation process. The parameters to be taken into account in the selection and sizing of a cogeneration plant are also defined, analyzing the different types of existing technology, their sizing and the selection of the associated fuel. All in all, it is a very complete program that will boost the professional within the energy sector.





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*You will learn the different types of cogeneration system technologies that exist, their future trends and how they can be successfully integrated with combined cycles”*

Due to the boom that this technology is having, especially in the residential and industrial field, we will study in detail its operation, alternatives in different processes, and the justification for its construction. Thus, in this program we will analyze the different types of cogeneration system technologies that currently exist and their future trends: with reciprocating engines, gas and steam turbines, and how they can be integrated with combined cycles. Likewise, we will break down the operation of the different alternative engines that exist and their influence on the generation process.

In this type of power plants, it is very important to acquire the knowledge of the operation and functioning of the pyrotubular steam generators; therefore, the student will learn how they work, the fuels used and the water treatment to which they are subjected. In this way, you will acquire in-depth knowledge of the technology of the absorption machines that are usually installed in this type of power plant.

On the other hand, since the production process in this type of power plant is based on heat transfer, a topic will be devoted exclusively to the heat exchangers used. Therefore, the analysis of cogeneration plants based on tails cycles, the organic fluids used and the associated thermodynamic process is addressed.

In turn, we will pay attention to the trigeneration, tetrageneration and microcogeneration modalities and their various applications. Finally, the program includes a focus on the evolution and new trends in cogeneration plants.

In addition, as it is a 100% online, program, it provides the student with the ease of being able to study it comfortably, wherever and whenever they want. All you need is a device with internet access to take your career one step further. A modality in line with the current times with all the guarantees to position the professional in a highly demanded area in continuous change, in line with the SDGs promoted by the UN.

This **Postgraduate Certificate in Production and Generation of Electricity with Cogeneration Plants and Methodologies** contains the most complete and up-to-date program on the market. The most important features of the program include:

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



*Thanks to this program, you will know how to assign priorities in trigeneration, tetrageneration and microcogeneration installations successfully, don't hesitate and start now!"*

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*In this TECH course, you will learn in detail the technology associated with reciprocating engines and turbines used in cogeneration plants”*

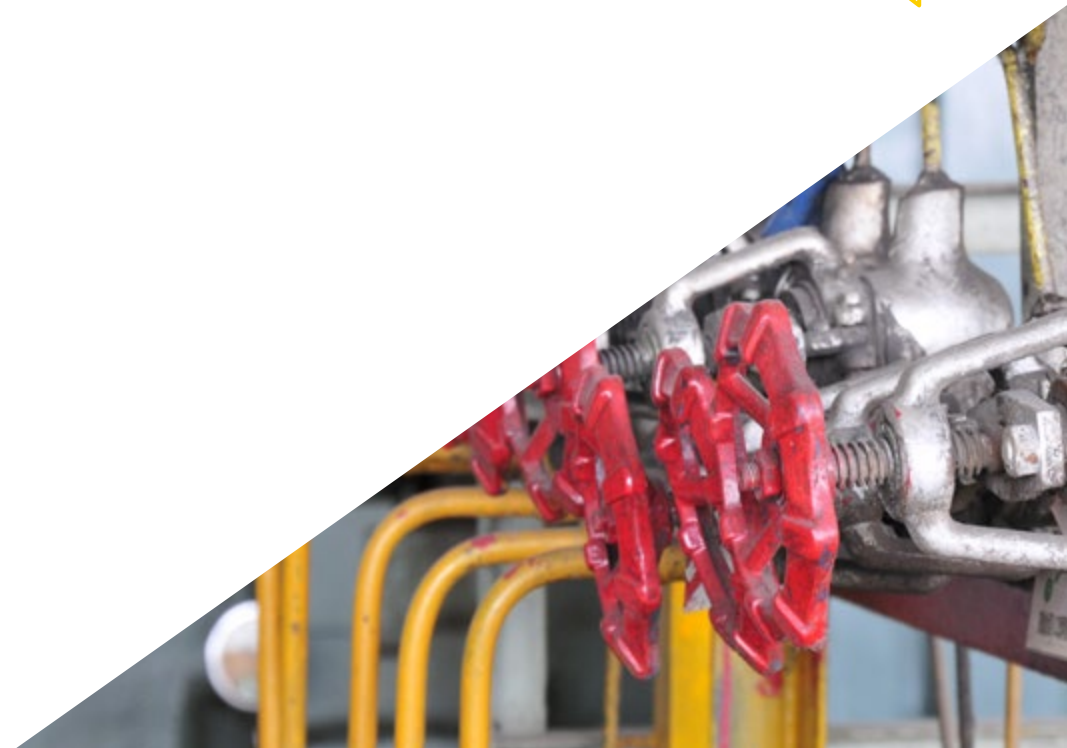
The program's teaching staff includes professionals from the sector who contribute their work experience to this training program, as well as renowned specialists from leading societies and prestigious universities.

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 an immersive training program designed 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 during the academic year. For this purpose, the professional will be assisted by an innovative interactive video system created by renowned and experienced experts.

*You will deepen your knowledge of pyrotube steam generators thanks to quality content prepared by experts.*

*You will successfully learn how to integrate the operation of the various technologies used in machines with absorption techniques.*



# 02 Objectives

The Postgraduate Certificate in Production and Generation of Electricity with Cogeneration Plants and Methodologies methodologies and Plants is aimed at providing the student with the necessary competencies regarding this energy system, with the latest updates and the most innovative aspects of the sector. In this way, we propose a specific and complete syllabus with quality content that, together with the guidance of experts, will enable the professional to achieve the following objectives.







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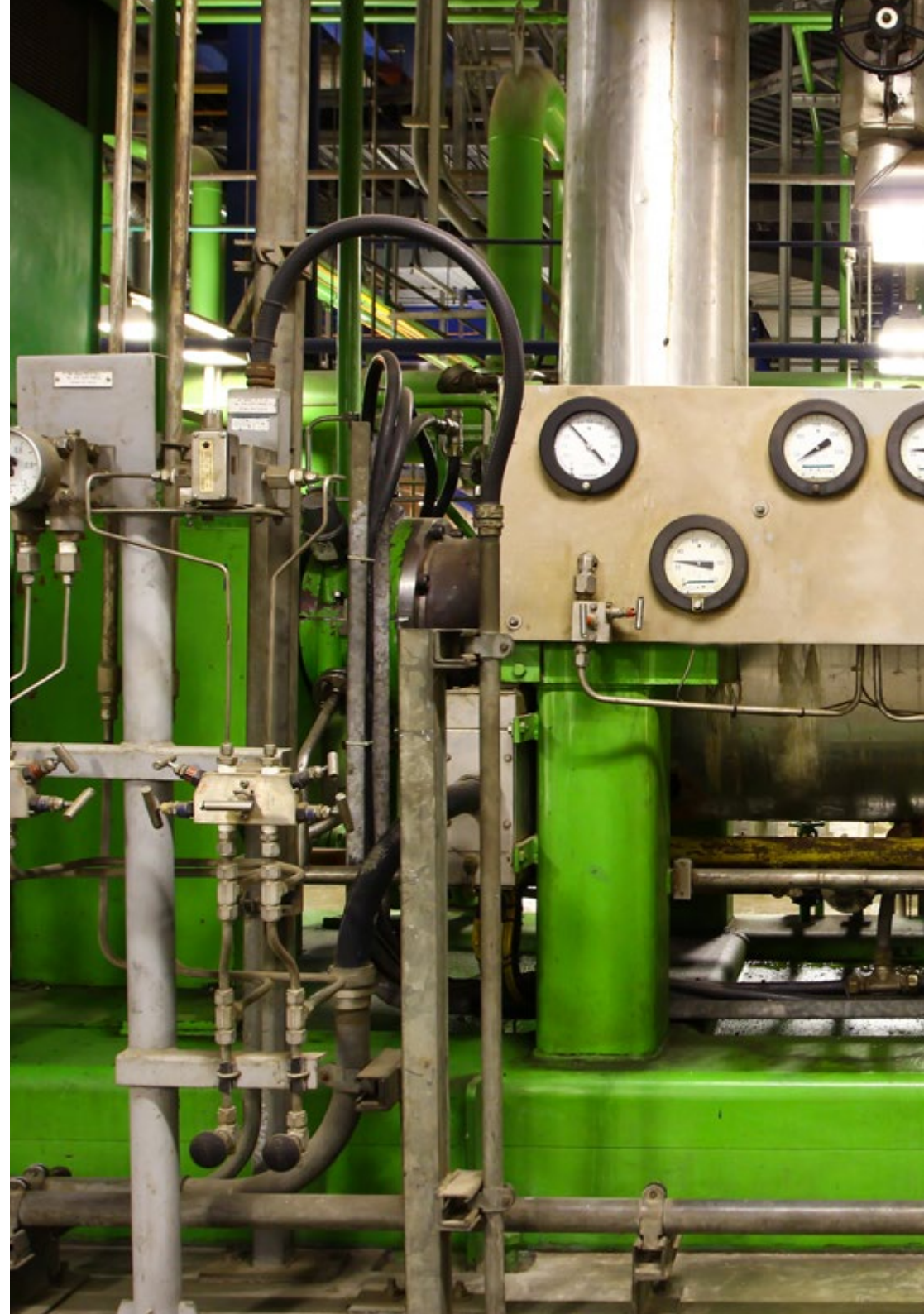
*You will acquire the necessary knowledge to establish the operating and safety criteria according to the requirements of the system to be supported by cogeneration"*

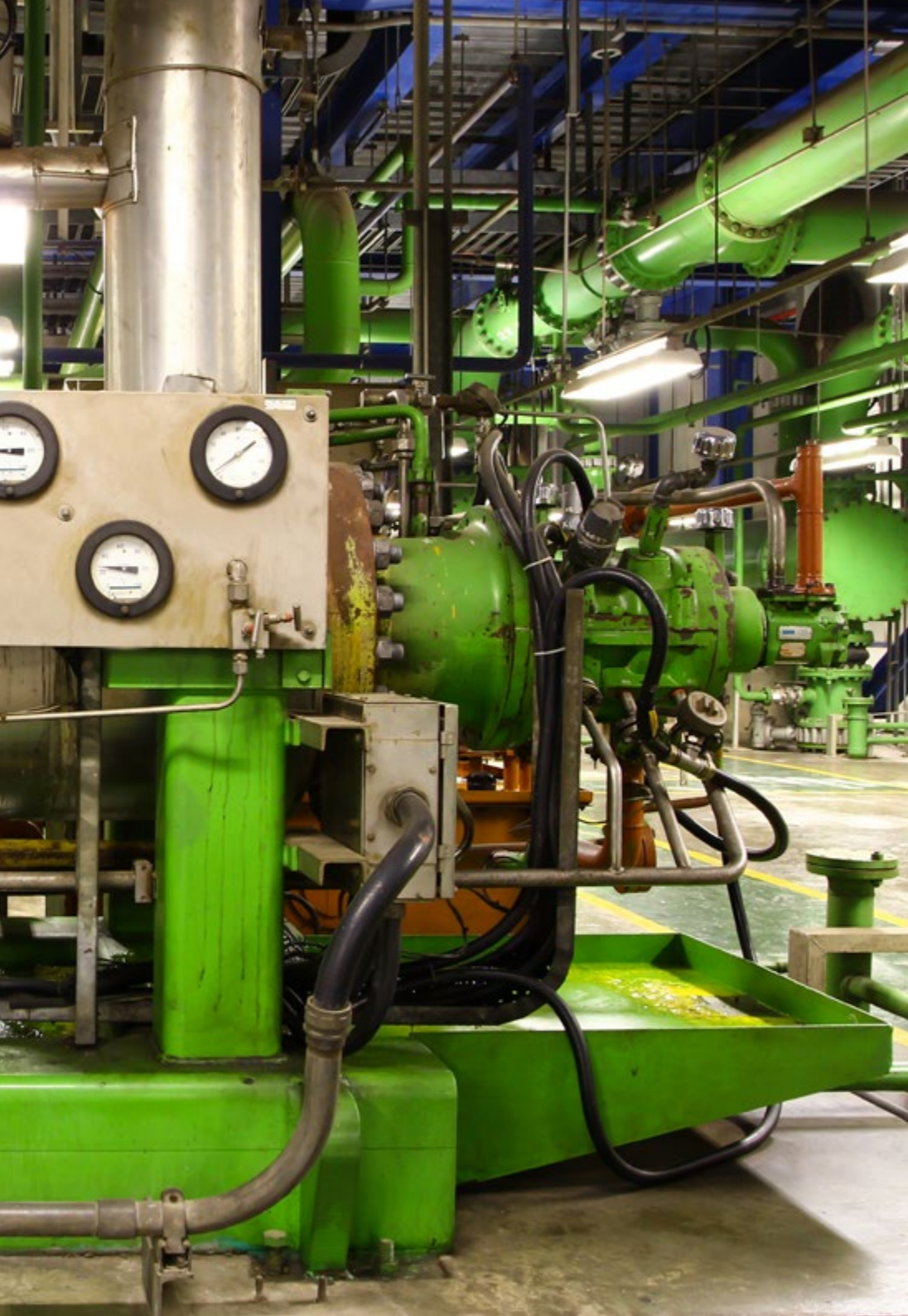


## General Objectives

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- ◆ Interpret the investments and feasibility of power generation plants
- ◆ Discover the potential business opportunities offered by electricity generation infrastructures
- ◆ Delve into the latest trends, technologies and techniques in electric power generation
- ◆ Identify the components necessary for the correct functionality and operation of the facilities that make up the power generation plants
- ◆ Establish preventive maintenance plans that ensure and guarantee the proper operation of the power plants, taking into account human and material resources, the environment and the most rigorous quality standards
- ◆ Successfully manage maintenance plans for power generation plants
- ◆ Analyze the different productivity techniques existing in power generation plants, taking into account the particular characteristics of each facility
- ◆ Select the most appropriate contracting model according to the characteristics of the power plant to be built





## Specific Objectives

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- ◆ Establish the operating and safety criteria according to the requirements of the system to be supported by cogeneration
- ◆ Analyze the different types of cycles that can exist in cogeneration plants
- ◆ Know in detail the technology associated with reciprocating engines and turbines used in cogeneration plants
- ◆ Deepen the knowledge of pyrotubular steam generators
- ◆ Integrate the operation of the various technologies used in the machines with absorption techniques
- ◆ Assigning priorities in trigeneration, tetrageneration and microcogeneration facilities.
- ◆ Supervise and control the correct operation of cogeneration plants with tail cycle
- ◆ Select the type and size of the cogeneration plant according to the energy needs to be covered in the adjacent installations
- ◆ Identify new trends in cogeneration plants

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*With this program you will be able to supervise and control the correct operation of cogeneration plants with tail cycle as an expert”*

# 03

# Course Management

The TECH University, in its maxim of offering an elite education for all, has renowned teachers, professionals in the sector so that the student acquires a solid knowledge in the production and generation of electricity with methodologies and cogeneration plants today. Therefore, this program has a highly qualified professional with extensive experience in the industry, whose trajectory has positioned them as great executives within the sector. In this way, it will offer the best tools to the student in the development of their skills during the course, with the guarantees required to specialize in a sector in full update and innovation, so it will reflect on the different energy production technologies with accuracy and precision to apply it in the transition to a quality and sustainable industry.



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*It stands out in the electric power industry focusing on the latest methodologies and successful cogeneration plants thanks to the professionals behind this program"*

## International Guest Director

Adrien Couton is a prominent **international leader in sustainability**, known for his optimistic approach towards transitions to zero net emissions. As such, with extensive **consulting** and **executive management** experience in **strategy and sustainability**, he has established himself as a truly creative problem solver and strategist focused on building high-performing organizations and teams that contribute to keeping **global warming** below 1.5°C.

As such, he has served as Vice President of Sustainability Solutions at ENGIE Impact, where he has helped large public and private entities plan and execute their transitions to **sustainability** and **zero carbon**. Notably, he has also led strategic partnerships and the commercial deployment of digital and advisory solutions to help clients achieve these goals. He has also been **Director of Firefly, Paris**, an independent **sustainability** consultancy.

Adrien Couton's career has also developed at the convergence of **private sector** initiatives and **sustainability**. Indeed, he has worked as **Engagement Manager** at **McKinsey & Company**, supporting European utilities, and as **Partner and Sustainability Practice Director** at **Dalberg**, a consulting firm focused on **emerging markets**. He has also been **Managing Director** of **India's largest decentralized water systems operator, Naandi Danone JV**, and has held the position of **Private Equity Analyst** at **BNP Paribas**.

To this must be added his time as **Global Portfolio Manager** at **Acumen Fund, New York**, where he has developed two investment portfolios (**Water and Agriculture**) in a pioneering social impact investment fund, applying a VC approach to **sustainability**. In this regard, Adrien Couton has proven to be a dynamic, creative and innovative leader, committed to the fight against **climate change**.



## Mr. Couton, Adrien

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- Vice President of Sustainability Solutions at ENGIE Impact, San Francisco, United States
- Director at Firefly, Paris
- Partner and Head of Sustainability Practice at Dalberg, India
- Executive Director at Naandi Danone JV, India
- Global Portfolio Manager, Water and Agriculture Portfolios at Acumen Fund, New York
- Engagement Manager at McKinsey & Company, Paris
- Consultant at The World Bank, India
- Private Equity Analyst at BNP Paribas, Paris
- Master's Degree in Public Administration at Harvard University, Harvard University
- Master's Degree in Political Science, Sorbonne University, Paris
- Master's Degree in Business Administration, Ecole d'Etudes Supérieures de Commerce (HECH) Paris

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*Thanks to TECH, you will be able to learn with the best professionals in the world”*

## Management



### Mr. Palomino Bustos, Raúl

- ◆ Director at the Institute for Technical Training and Innovation
- ◆ International Consultant in Engineering, Construction and Maintenance of Energy Production Plants for the company RENOVETEC
- ◆ Technological/training expert recognized and accredited by the State Public Employment Service.
- ◆ Industrial Engineer, University of Carlos III in Madrid
- ◆ Industrial Technical Engineer by the EUITI of Toledo
- ◆ Master's Degree in Occupational Risk Prevention from the Francisco de Vitoria University.
- ◆ Master's Degree in Quality and Environment by the Spanish Quality Association





# 04

## Structure and Content

The structure of the contents of this program has been designed by engineering professionals focused on the production and generation of electric energy with cogeneration methodologies and plants, so that they have poured their knowledge and experience into a complete and updated syllabus, oriented towards the sustainability of the sector and the use of resources. The syllabus includes information on its functionality and process alternatives, analyzing in detail the types of existing cycles and the sizing of a plant of these characteristics. Therefore, this curriculum is essential to move towards a more sustainable industry, covering all the knowledge that professionals need to be competent in their day-to-day work in this sector.





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*You will learn about the latest trends in cogeneration plants, their performance, gas turbines and reciprocating engines”*

## MODULE 1. Cogeneration

### 1.1. Structural Analysis

- 1.1.1. Functionality
- 1.1.2. Heat Needs
- 1.1.3. Alternatives in the Processes
- 1.1.4. Justification

### 1.2. Types of Cycles

- 1.2.1. With Reciprocating Gas or Fuel Oil Engine.
- 1.2.2. With a Gas Turbine
- 1.2.3. With a Steam Turbine
- 1.2.4. In Combined Cycle with Gas Turbine
- 1.2.5. In Combined cycle with Reciprocating Engine

### 1.3. Alternative Motors

- 1.3.1. Thermodynamic Effects
- 1.3.2. Gas Engine and Auxiliary Elements
- 1.3.3. Energy Recovery

### 1.4. Pyrotubular Boilers

- 1.4.1. Boiler Types
- 1.4.2. Combustion
- 1.4.3. Water Treatment

### 1.5. Absorption Machines

- 1.5.1. Operation
- 1.5.2. Absorption vs. Compression
- 1.5.3. Water/Lithium Bromide
- 1.5.4. Ammonia/Water

### 1.6. Trigeneration, Tetrageneration and Microcogeneration

- 1.6.1. Trigeneration
- 1.6.2. Tetrageneration
- 1.6.3. Microcogeneration

### 1.7. Exchangers

- 1.7.1. Classification
- 1.7.2. Air-Cooled Exchangers
- 1.7.3. Plate Heat Exchangers

### 1.8. Tail Cycles

- 1.8.1. ORC Cycles
- 1.8.2. Organic Fluids
- 1.8.3. Kalina Cycle

### 1.9. Selection of Cogeneration Plant Type and Size

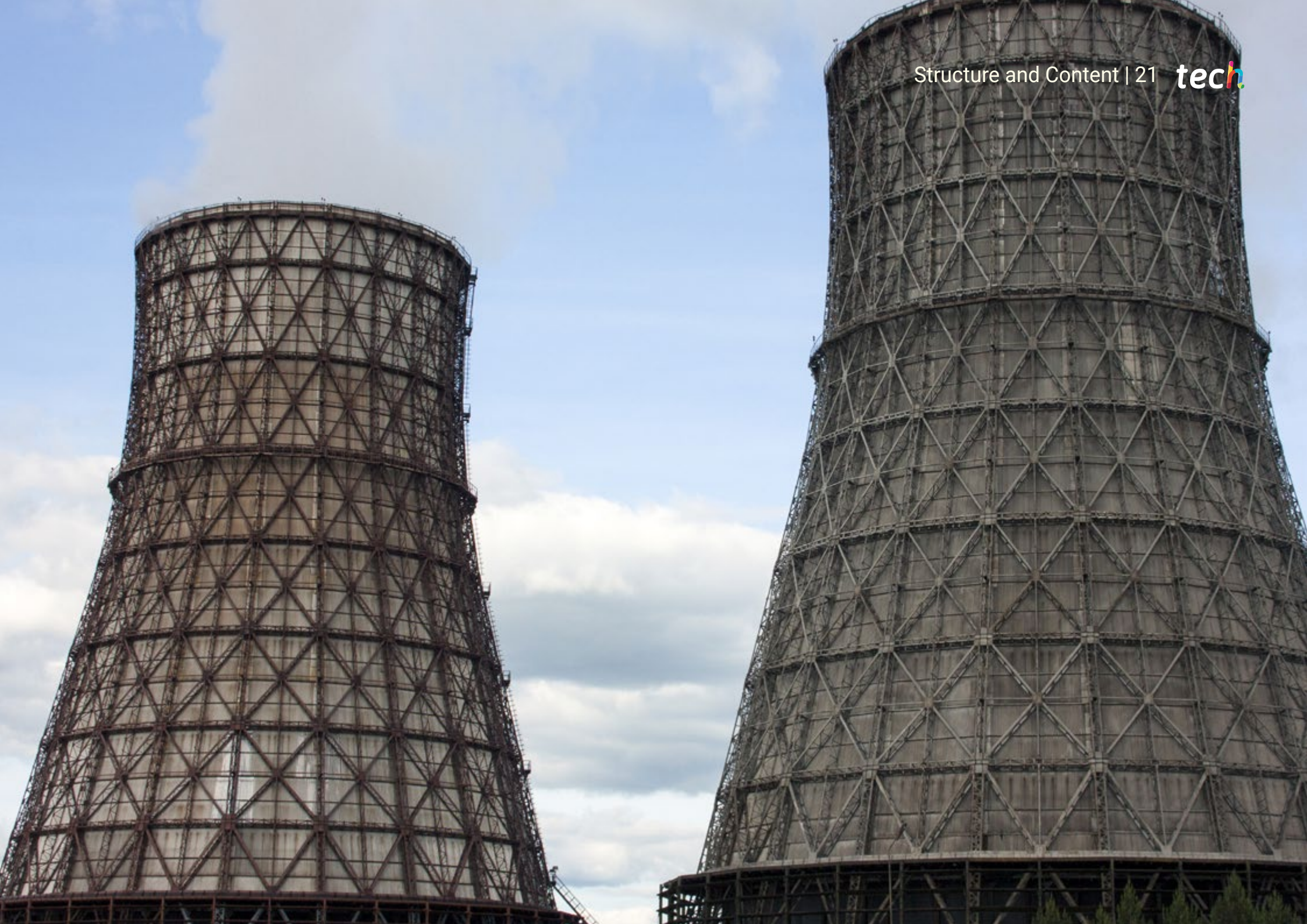
- 1.9.1. Design
- 1.9.2. Types of Technologies
- 1.9.3. Selection of Fuel
- 1.9.4. Dimensioning

### 1.10. New Trends in Cogeneration Plants

- 1.10.1. Services
- 1.10.2. Gas Turbine
- 1.10.3. Alternative Motors



*Stand out in the electric power sector by applying the latest trends in methodologies and cogeneration plants of this Postgraduate Certificate"*

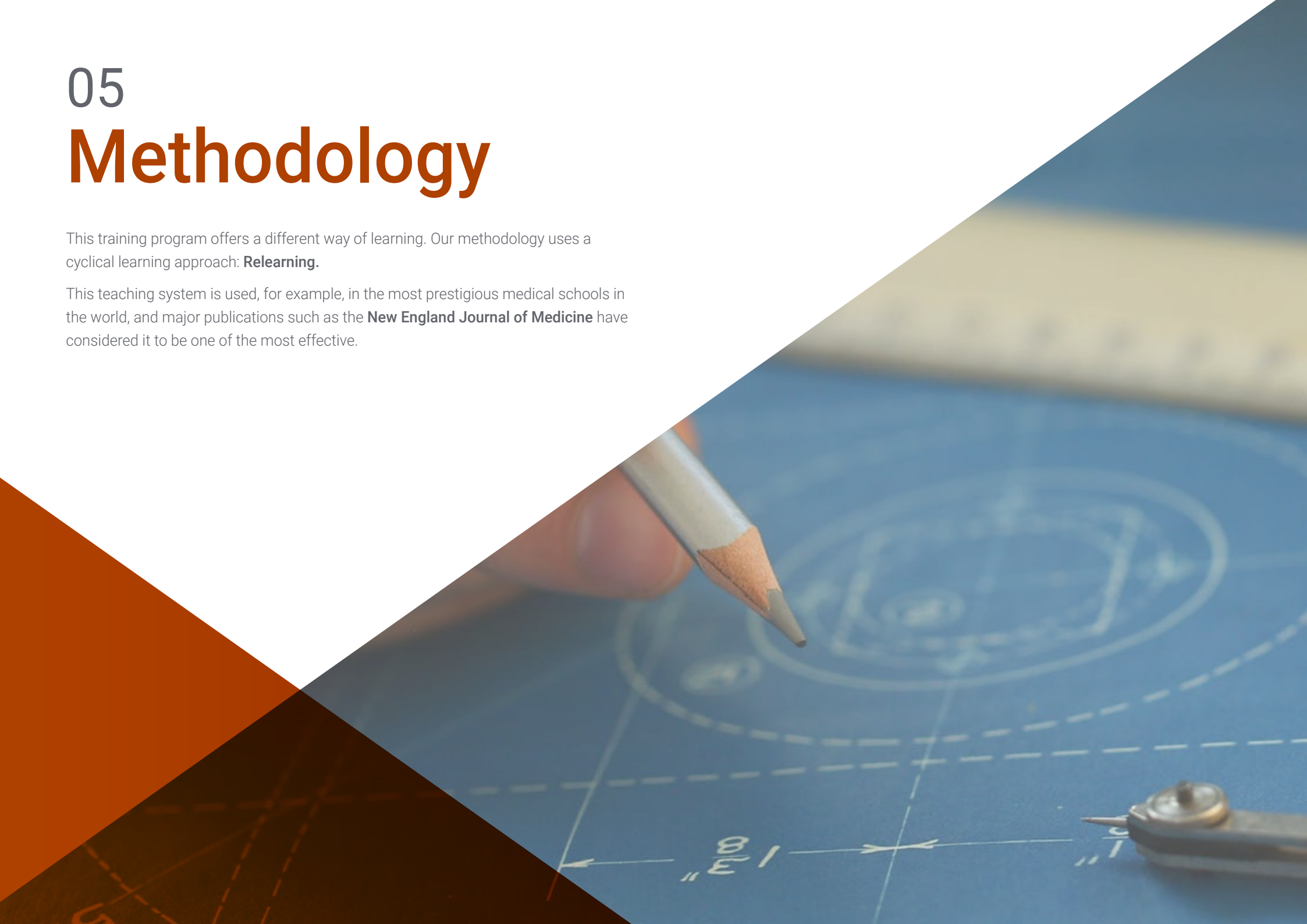


05

# Methodology

This training program offers 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.



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*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”*

## At TECH we use the Case Method

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

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



*We are the first online university to combine Harvard Business School case studies with a 100% online learning system based on repetition.*





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

### A learning method that is different and innovative

This intensive Engineering program at TECH Global University prepares you to face all the challenges in this field, both nationally and internationally. We are committed to promoting your personal and professional growth, the best way to strive for success, that is why at TECH Global University you will use Harvard case studies, with which we have a strategic agreement that allows us, to offer you material from the best university in the world.

“*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 by 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 is the first university in the world to combine Harvard University case studies with a 100% online learning system based on repetition, which combines 8 different didactic elements in each lesson.

We enhance Harvard case studies 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 university 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.

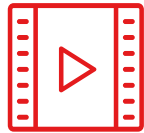
*Relearning will allow you to learn with less effort and better performance, involving you more in your training, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation for success.*

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

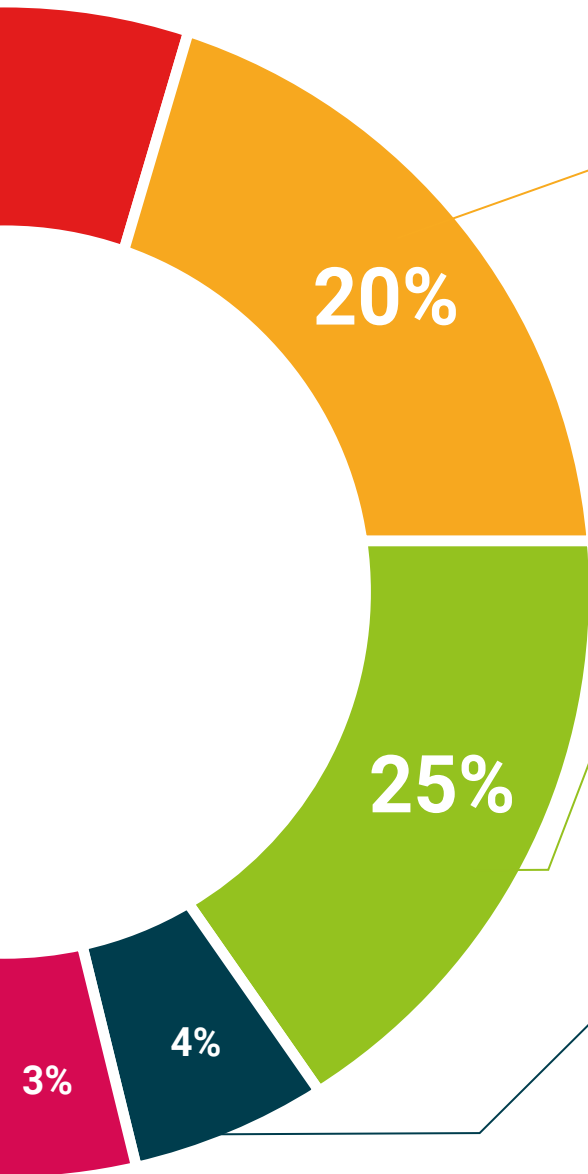
They will carry out activities to develop specific competencies and skills in each thematic area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization we live in.



### 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**

They will complete a selection of the best case studies in the field used at Harvard. Cases that are presented, analyzed, and supervised by the best senior management 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 multimedia content presentation training Exclusive system 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 your goals.



06

# Certificate

The Postgraduate Certificate in Production and Generation of Electricity with Cogeneration Plants and Methodologies guarantees you, in addition to the most rigorous and up-to-date training, access to a Postgraduate Certificate issued by a prestigious university: TECH Global University.





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*With TECH degree you will  
advance in your career path  
and achieve your career goal”*

This program will allow you to obtain your **Postgraduate Certificate in Production and Generation of Electricity with Cogeneration Plants and Methodologies** endorsed by **TECH Global University**, the world's largest online university.

**TECH Global University** is an official European University publicly recognized by the Government of Andorra ([official bulletin](#)). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

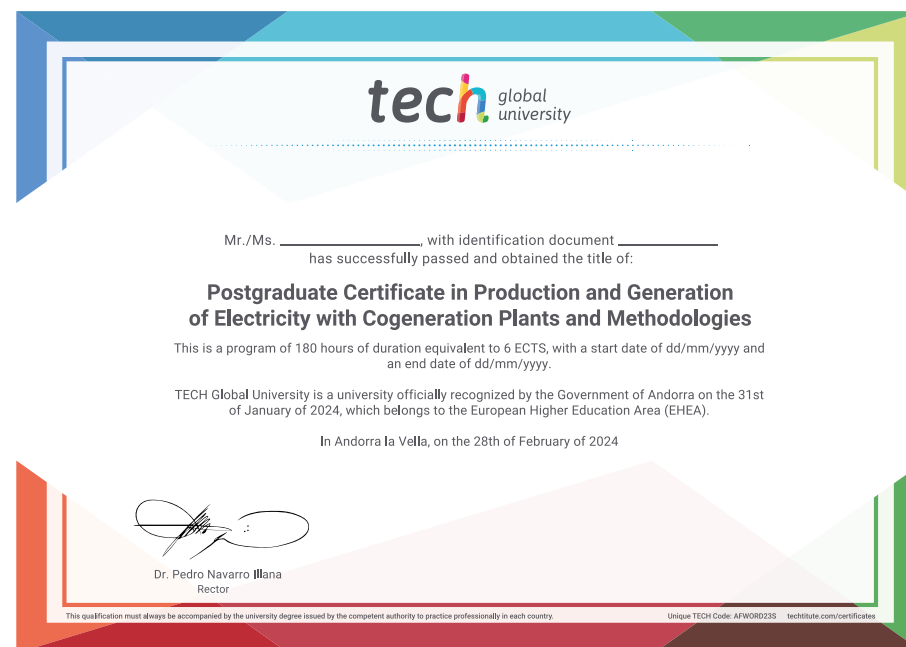
This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in Production and Generation of Electricity with Cogeneration Plants and Methodologies**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**





future

health confidence people

education information tutors

guarantee accreditation teaching

institutions technology learning

community commitment

**tech** global  
university

personalized service innovation

knowledge present  
online tr  
Plants and Methodologies

development lang

classroom

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