

Postgraduate Certificate Industrial Boilers for Electric Power Generation and Production





Postgraduate Certificate

Industrial Boilers for Electric Power Generation and Production

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

Website: www.techtitude.com/us/engineering/postgraduate-certificate/industrial-boilers-electric-power-generation-production

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01

Introduction

This program deals in depth with the fundamentals of electricity production, from the fuels used in the different thermodynamic cycles to their influence on the optimization of electricity generation. In this way, the impact of all the systems involved in steam production and how to improve their effectiveness and productivity is analyzed. In addition, since steam generators are dangerous machines, it is considered how to operate them safely and the different types of control to which they are currently subjected, as well as the components used to perform them.



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Delve into the fundamentals of electrical production and master the operation of steam generators used for electric power generation with this unique program from TECH"

In this course, the fundamentals of electricity production will be discussed in detail. Due to the large number of fuels that can be used, we will study their influence on the different thermodynamic cycles and how the planning of each of them affects the generation activity.

Similarly, the characteristics of steam and how they influence the different processes to which it can be subjected to optimize the generation of electrical energy will be analyzed, as well as the operation of steam generators used for the production of electrical energy.

It also discusses the impact of all the systems involved in steam production and how to improve their effectiveness and productivity. On the other hand, since steam generators are dangerous machines, it will be shown how to operate them safely and the different types of control to which they are subjected, as well as the components used to perform them.

In addition, as it is a 100% online Postgraduate Certificate, it provides the student with the ease of being able to take 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.



You will discover the impact of all the systems involved in steam production and learn how to successfully improve their effectiveness and productivity”

This **Postgraduate Certificate in Industrial Boilers for Electric Power Generation and Production** 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

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Thanks to this program you will know how to optimize the performance of thermodynamic processes in different power 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.

Learn how to operate a steam generator safely and the different types of controls they are currently subjected to.

TECH is the university of the future that adapts to you and that is why it offers you this fully online Postgraduate Certificate so that you can take it when, where and how you want.



02

Objectives

The Postgraduate Certificate in Industrial Boilers for Electric Power Generation and Production is aimed at providing students with the necessary skills in financing within the electric power production and generation industry, thus enabling them to successfully manage and administer the economics of the associated power plants. In this way, the student will approach important aspects such as the analysis and study of the thermodynamic processes that occur during the operation of the industrial processes of electric power generation. Thus, TECH proposes a specific and complete syllabus with quality content that, together with the guidance of experts, will help the professional achieve the following objectives.





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Interpreting the concepts of energy and heat involved in the production of electrical energy, along with the different fuels involved in the process, will be one of your objectives to achieve”



General Objectives

- ◆ 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

- ◆ Interpret the concepts of energy and heat involved in the production of electrical energy, together with the different fuels involved in the process
- ◆ Address the analysis and study of the thermodynamic processes that occur during the operation of industrial processes for the generation of electrical energy
- ◆ Break down the components and equipment that make up the steam generators used in the production of electrical energy
- ◆ Acquire knowledge of the operation of the systems that are part of steam generators
- ◆ Analyze the operating procedures of steam generators for safe functionality
- ◆ Correctly manage the different controls to which steam generators used for electric power generation must be subjected

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With this program you will be able to correctly manage the various controls to which steam generators used to generate electricity must be subjected”

03

Course Management

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 industrial boilers for the production and generation of electrical energy 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 students in the development of their skills during the course, with the guarantees required to specialize in a sector in full update and innovation, which demands excellent professionals who bring new approaches to the profession.



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Acquire the skills you need in the electrical energy sector focused on industrial boilers thanks to the excellence of the professionals who have poured their knowledge into this course"

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

- ♦ 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 with a special focus on industrial boilers for the production and generation of electricity, so that they have poured their knowledge and experience in the realization of a complete and up-to-date syllabus, in line with TECH's quality standard. The syllabus includes information on the fundamentals of electricity production, from the fuels used in the different thermodynamic cycles to their influence on the optimization of electricity generation. Therefore, this curriculum is essential for students to acquire all the knowledge they need to be competent in their day-to-day work in this sector.





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You will learn from steam power cycles or steam thermodynamics to everything about watertube boilers for power generation thanks to TECH”

MODULE 1. Industrial Boilers for Electric Power Generation and Production

- 1.1. Energy and Heat
 - 1.1.1. Fuels
 - 1.1.2. Energy
 - 1.1.3. Thermal Power Generation Process
- 1.2. Steam Power Cycles
 - 1.2.1. Carnot Power Cycle
 - 1.2.2. Simple *Rankine* Cycle
 - 1.2.3. *Rankine* Cycle with Superheating
 - 1.2.4. Effects of Pressure and Temperature on the *Rankine* Cycle
 - 1.2.5. Ideal Cycle vs. Real Cycle
 - 1.2.6. Ideal *Rankine* Cycle with Superheating
- 1.3. Steam Thermodynamics
 - 1.3.1. Steam
 - 1.3.2. Steam Types
 - 1.3.3. Thermodynamic Processes
- 1.4. Steam Generator
 - 1.4.1. Functional Analysis
 - 1.4.2. Parts of a Steam Generation
 - 1.4.3. Equipment of a Steam Generator
- 1.5. Water-Tube Boilers for Power Generation
 - 1.5.1. Natural Circulation
 - 1.5.2. Forced Circulation
 - 1.5.3. Water-Steam Circuit
- 1.6. Systems of the Steam Generator I
 - 1.6.1. Fuel System
 - 1.6.2. Combustion Air System
 - 1.6.3. Water Treatment System
- 1.7. Systems of the Steam Generator II
 - 1.7.1. Water Preheating System
 - 1.7.2. Flue Gas System
 - 1.7.3. Blower Systems
- 1.8. Safety in Steam Generator Operation
 - 1.8.1. Security Standards
 - 1.8.2. BMS for Steam Generators
 - 1.8.3. Functional Requirements
- 1.9. Control System
 - 1.9.1. Fundamental Principles
 - 1.9.2. Control Mode
 - 1.9.3. Basic Operations
- 1.10. The Control of a Steam Generator
 - 1.10.1. Basic Controls
 - 1.10.2. Combustion Control
 - 1.10.3. Other Variables to Control



With this TECH specialization you will stand out professionally, boosting your career path towards the control of a steam generator"

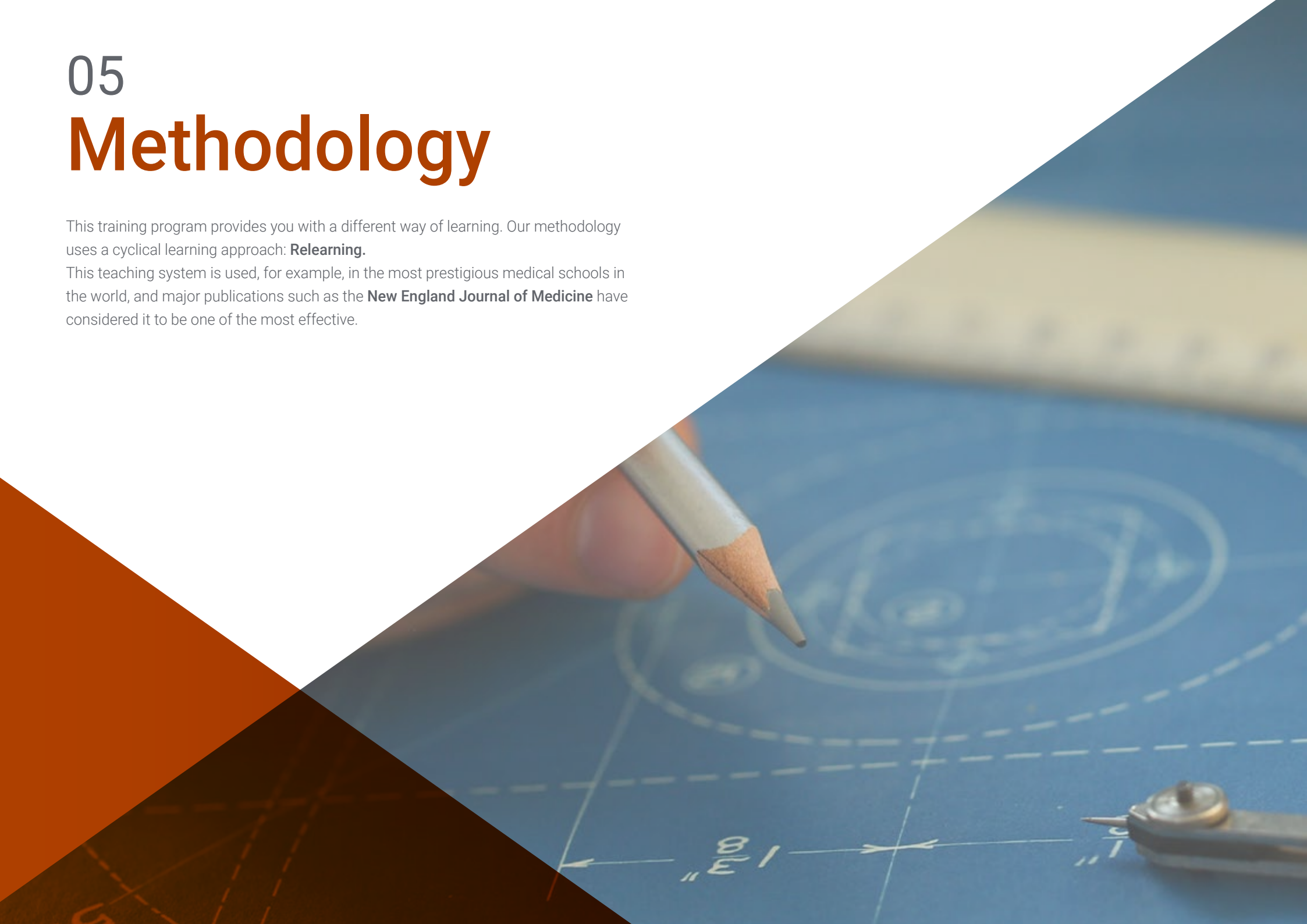


05

Methodology

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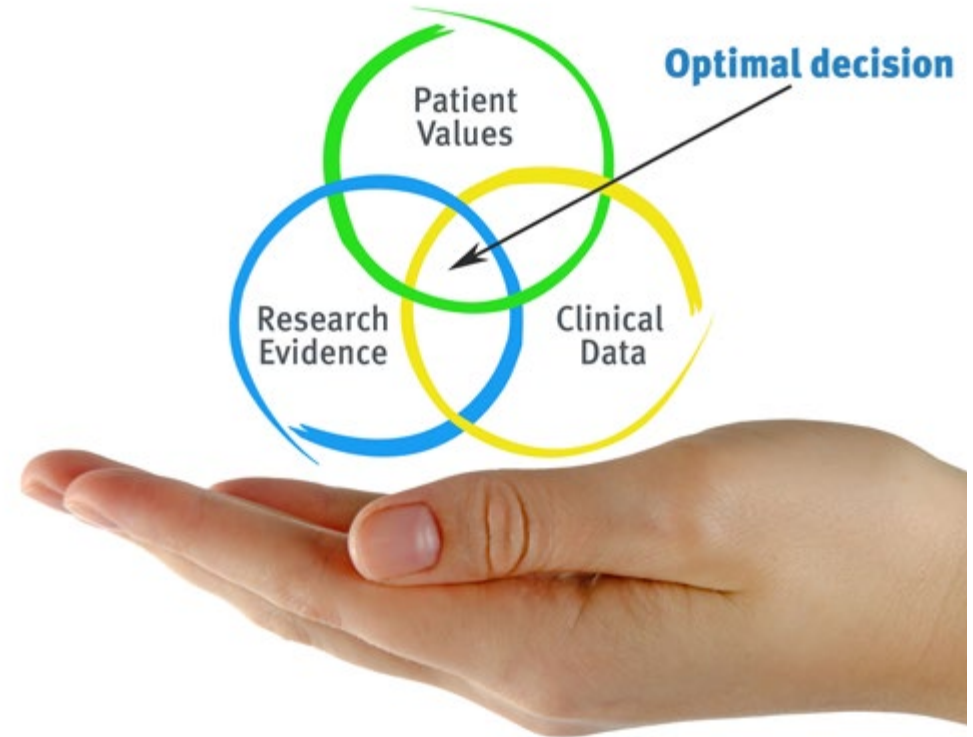
Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

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.



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 Spanish-language 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 Spanish-speaking university qualified 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 Spanish 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.



In this program you will have access to the best educational material, prepared with you 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

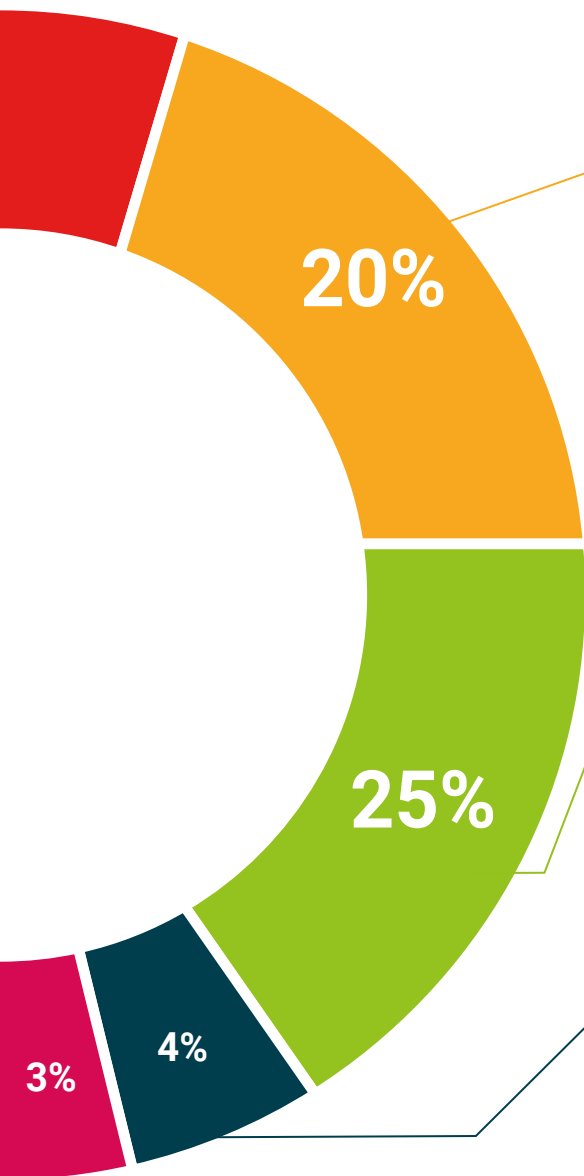
They will carry out activities to develop specific competencies and skills in each thematic area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization we live in.



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 Latin America.



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 & Re-testing

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 Industrial Boilers for Production and Generation of Electric Energy 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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*Achieve professional success thanks
to this TECH specialization”*

This program will allow you to obtain your **Postgraduate Certificate in Industrial Boilers for Electric Power Generation and Production** 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 Industrial Boilers for Electric Power Generation and Production**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**



*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH Global University 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

tech global
university

personalized service innovation

knowledge present
and Production

development language

classroom

Postgraduate Certificate Industrial Boilers for Electric Power Generation and Production

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Postgraduate Certificate

Industrial Boilers for Electric Power Generation and Production

