Postgraduate Certificate

Efficient Production and Generation of Electricity through Combined Cycles

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Postgraduate Certificate
Efficient Production and Generation of Electricity through Combined Cycles

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

Website: **www.techtitute.com/in/engineering/postgraduate-certificate/efficient-production-generation-electricity-through-combined-cycles**

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01

Introduction

This program deals in depth with the technology used in combined cycle power plants, the influence of the different variables in this type of production and the future trends in its development and evolution. In addition, it establishes the influence of international environmental agreements and how they affect the electricity generation activity, given its importance today. On the other hand, it deals with the thermodynamic processes of this type of power plants and how to improve their efficiency and productivity. It also shows the productivity and functionality of a combined cycle power plant with hybridization using solar technology.

You will learn how to structure the auxiliary systems of combined cycle plants and you will know how to select the ideal operating level based on the different types of existing combined cycle plants"

Once the knowledge of conventional thermal power plants and solar generation has been acquired, we are in a position to address the operation of combined cycle power plants. Therefore, this TECH program studies in detail the technology used in this type of power plants, the influence of the different variables in this type of production and the future trends in its development and evolution.

On the one hand, TECH will establish the influence of international environmental agreements and how they affect the electricity generation activity. On the other hand, the thermodynamic processes of this type of power plants and how to improve their efficiency and productivity will be analyzed.

Likewise, all the necessary knowledge will be acquired to be able to work, operate and design the gas turbines that are part of this type of power plants, paying special attention to the recovery boilers that are used, breaking down their components, the performance of the equipment that make them up and the performance that can be obtained.

In addition, a fundamental part of this type of power plant is the steam turbine used, so TECH will focus on its operation and performance. In turn, it breaks down the different types of combined cycle power plants that exist and their associated configurations. Finally, the student will learn to analyze the design, productivity and functionality of a combined cycle power plant with hybridization using solar technology.

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.

This **Postgraduate Certificate in Production and Generation of Electricity through Combined Cycles** 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 self assessment can be used 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 Postgraduate Certificate, you will know how to elaborate hybridization projects of combined cycles with solar energy"

You will get to coordinate the operation of the different systems that are part of the combined cycle facilities thanks to this TECH Postgraduate Certificate"

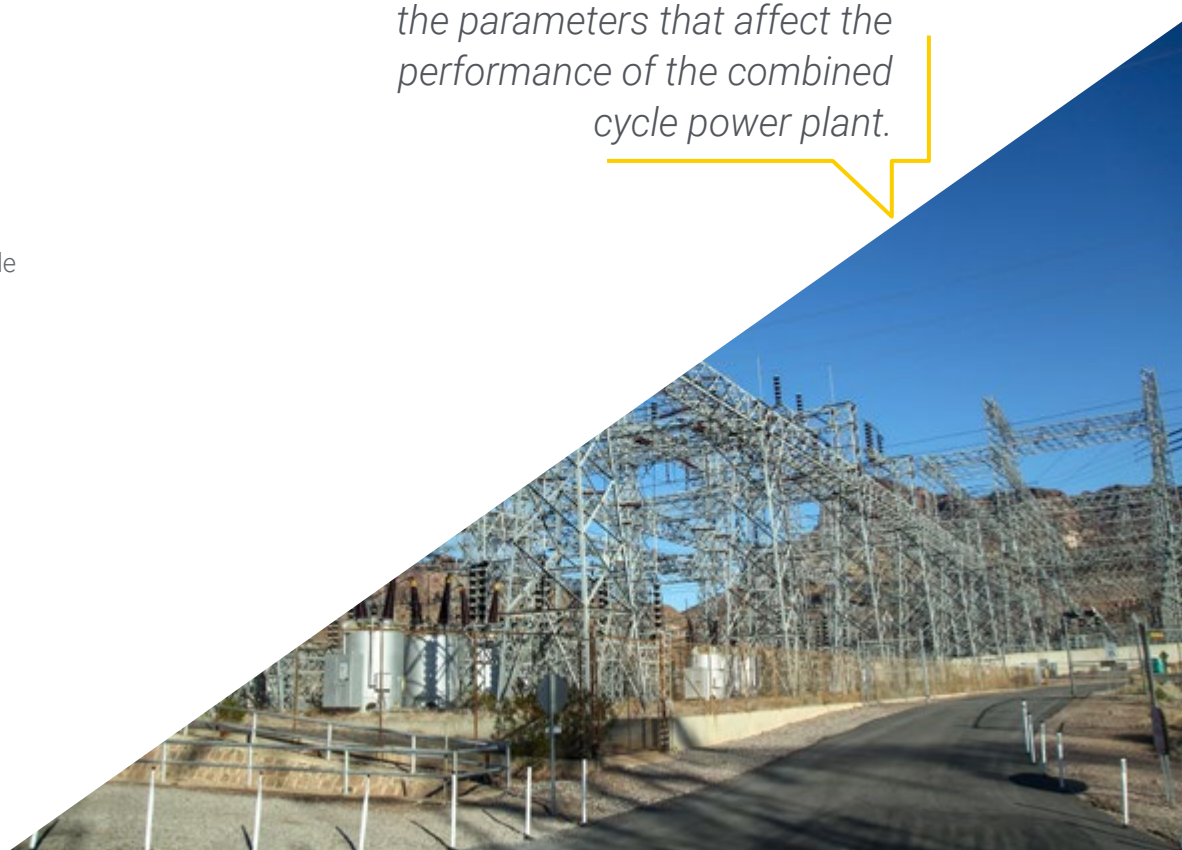
Learn in detail about the protocols and treaties on atmospheric emissions and how they influence combined cycle plants and contribute to creating a more sustainable industry.

You will successfully identify the parameters that affect the performance of the combined cycle power plant.

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.

The design of this Program focuses on Problem Based Learning, by means of which the professional will have to try to solve the different situations of Professional Practice, which will be posed throughout the Program. For this purpose, the professional will be assisted by an innovative interactive video system created by renowned and experienced experts.



02

Objectives

The Postgraduate Certificate in Efficient Production and Generation of Electricity through Combined Cycles is aimed at providing students with the necessary skills in efficient production and generation of electric energy through combined cycles with the latest international updates, thus enabling them to successfully achieve a more sustainable 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.

Acquire the necessary knowledge to dimension improvements in the thermodynamic processes of energy production in this type of power plants"

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

- Coordinate the operation of the different systems that are part of the combined cycle facilities
- Sizing improvements in the thermodynamic processes of energy production in this type of power plants
- Detailed knowledge of the protocols and treaties on atmospheric emissions and how they influence combined cycle plants
- Acquire the necessary knowledge to optimize the operation of gas turbines, reciprocating engines and waste heat boilers
- Identify the parameters that affect the performance of the combined cycle power plant
- Structuring the auxiliary systems of combined cycle plants
- Select the ideal operating level based on the different types of existing combined cycle plants
- Develop projects for hybridization of combined cycles with solar energy

With this program you will be able to select the ideal operating level based on the different types of existing combined cycle plants"

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 the production and generation of electricity with conventional thermal techniques 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 program, 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.

Master the Brayton Cycle and apply Rankine Cycle improvements by learning with the best experts, together with TECH"

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 efficient electrical energy through combined cycles, so that they have poured their knowledge and experience into a complete and updated syllabus, oriented towards the efficiency and sustainability of the sector. The agenda includes information on combined cycle technology, international agreements for sustainable development and the characteristics of the elements that make up this type of energy. 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.

You will learn about the latest technologies used in combined cycles and the characteristics of international agreements for sustainable development such as the Kyoto Protocol"

Module 1. Combined Cycle

1.1. Combined Cycle
- 1.1.1. Current Combined Cycle Technology
- 1.1.2. Thermodynamics of Combined Gas Steam Cycles
- 1.1.3. Future Trends in Combined Cycle Development

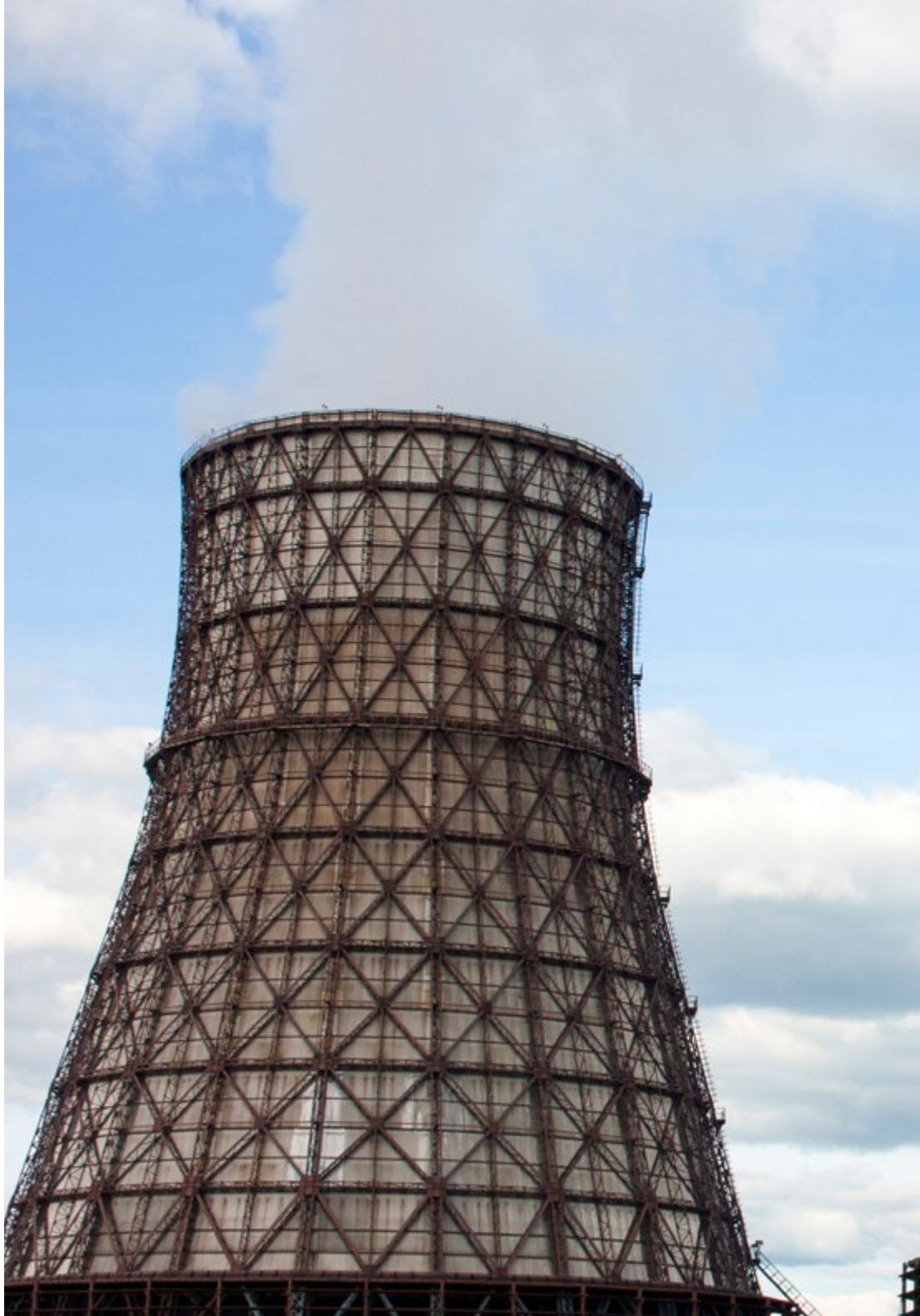
1.2. International Agreements for Sustainable Development
- 1.2.1. *Kyoto* Protocol
- 1.2.2. Montreal Protocol
- 1.2.3. *Paris Climate*

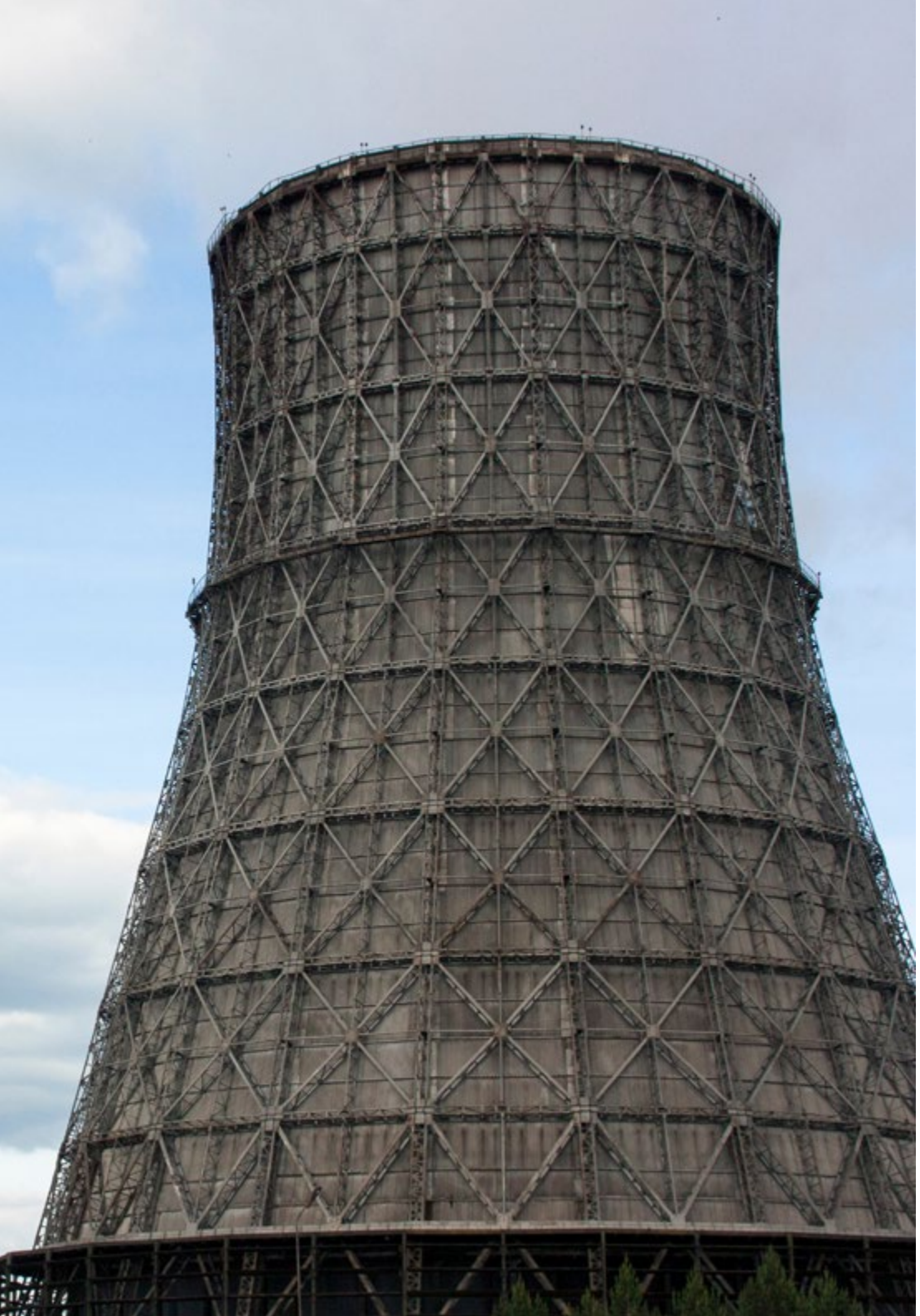
1.3. Brayton Cycle
- 1.3.1. Ideal
- 1.3.2. Real
- 1.3.3. Cycle Improvements

1.4. *Rankine* Cycle Improvements
- 1.4.1. Intermediate Reheating
- 1.4.2. Regeneration
- 1.4.3. Use of Supercritical Pressures

1.5. Gas Turbine
- 1.5.1. Operation
- 1.5.2. Performance
- 1.5.3. Systems and Subsystems
- 1.5.4. Classification

1.6. Recovery Boiler
- 1.6.1. Recovery Boiler Components
- 1.6.2. Pressure Levels
- 1.6.3. Performance
- 1.6.4. Characteristic Parameters





1.7. Steam Turbines
- 1.7.1. Components
- 1.7.2. Operation
- 1.7.3. Performance

1.8. Auxiliary Systems
- 1.8.1. Cooling System
- 1.8.2. Combined Cycle Performance
- 1.8.3. Advantages of Combined Cycles

1.9. Pressure Levels in Combined Cycles
- 1.9.1. A Level
- 1.9.2. Two Levels
- 1.9.3. Three Levels
- 1.9.4. Typical Configurations

1.10. Combined Cycle Hybridization
- 1.10.1. Fundamentals
- 1.10.2. Economic Analysis
- 1.10.3. Emission Savings

Take the step and specialize with TECH, now is the time to reach your dream job"

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.

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 Technological 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 Technological 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

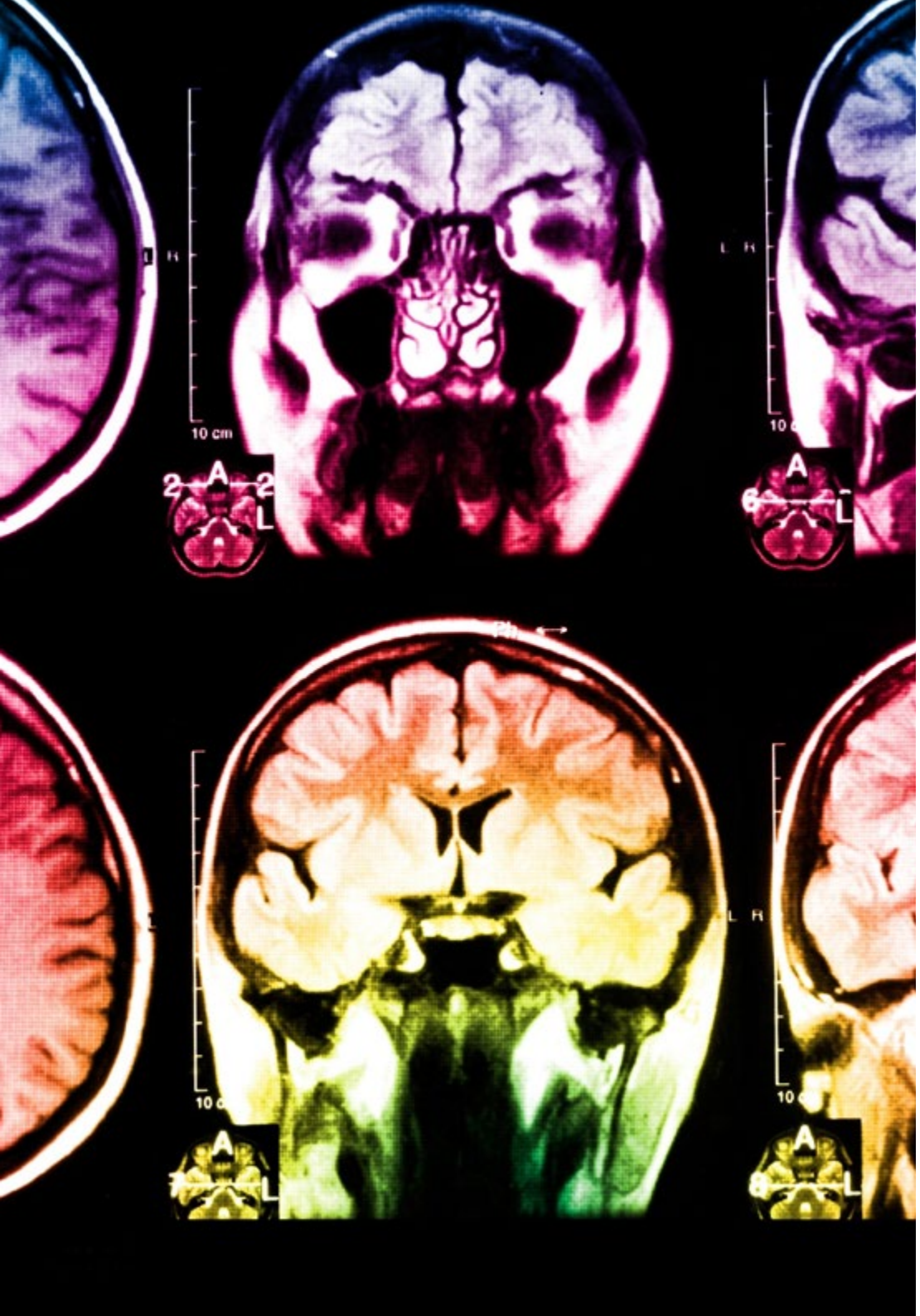
TECH is the first university in the world to combine Harvard University case studies with a 100% online learning system based on repetition, which combines 8 different didactic elements in each lesson.

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

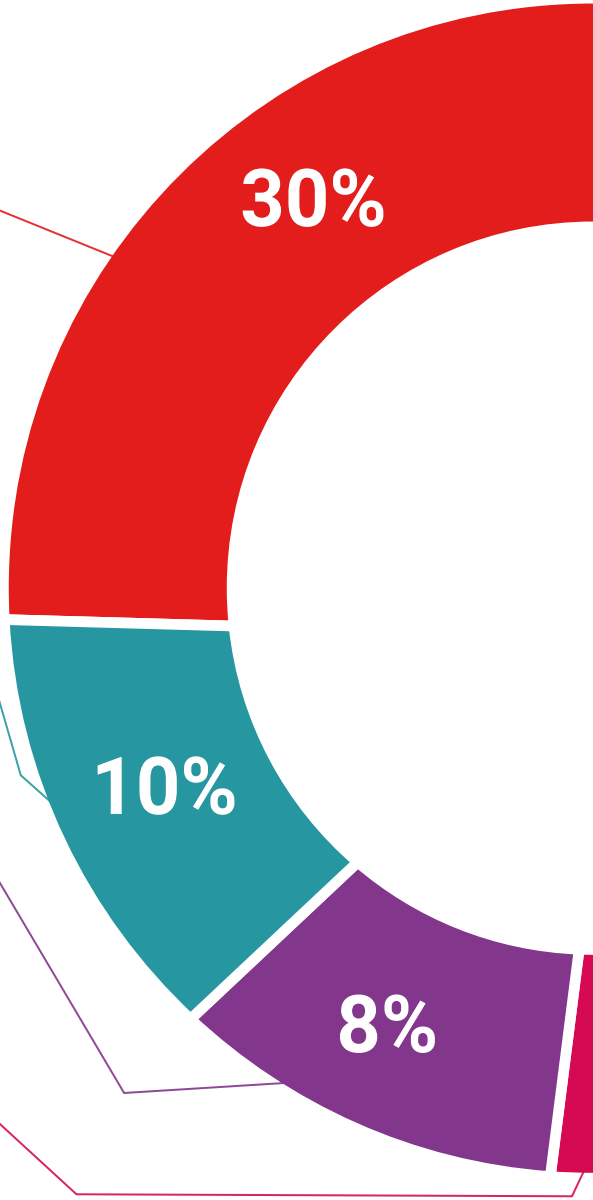
There is scientific evidence suggesting that observing third-party experts can be useful. Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

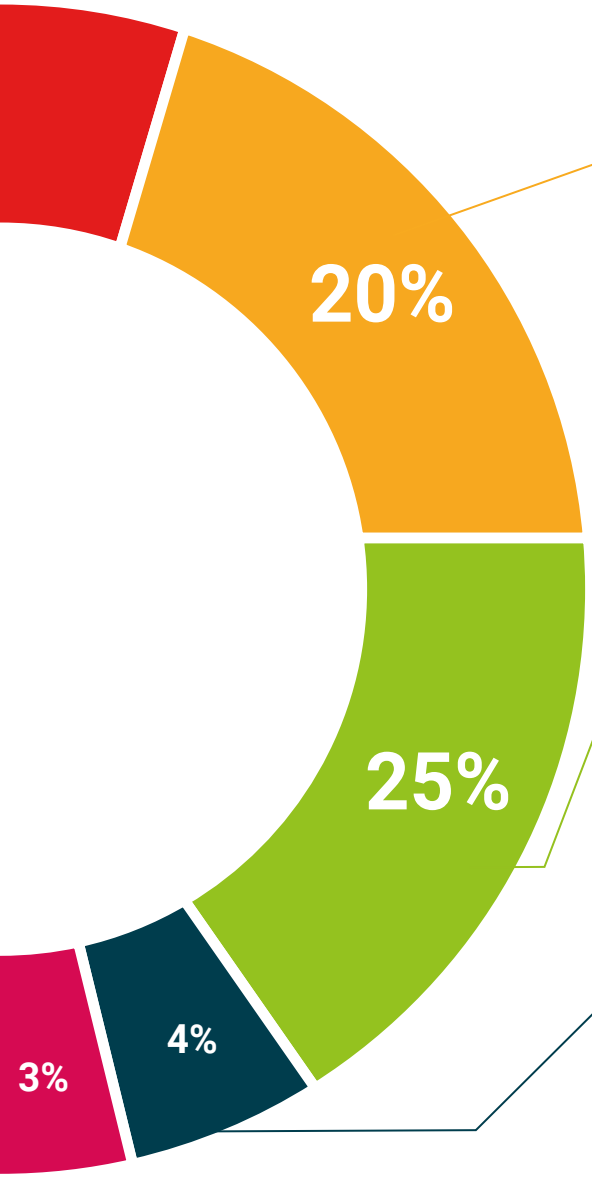
Practising Skills and Abilities

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 through Combined Cycles, in addition to the most rigorous and up to date training, access to a Postgraduate Certificate issued by TECH Technological University.

Achieve professional success with this TECH degree and propel your career path to the highest level"

This **Postgraduate Certificate in Efficient Production and Generation of Electricity through Combined Cycles** 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 Certificate** issued by **TECH Technological University** via tracked delivery*.

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

Title: **Postgraduate Certificate in Efficient Production and Generation of Electricity through Combined Cycles**

Official Nº of hours: **150 h.**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Awards the following

CERTIFICATE

to

Mr./Ms. _____, with identification number _____.

For having passed and accredited the following program

POSTGRADUATE CERTIFICATE

in

Efficient Production and Generation of Electricity through Combined Cycles

This is a qualification awarded by this University, equivalent to 150 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018.

June 17, 2020

Tere Guevara Navarro
Dean

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country.

Unique TECH Code: AFWORD23S techtitute.com/certificates

*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.

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