

Postgraduate Certificate Construction and Operation of Electricity Production and Generation Power Plants





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- » Modality: **online**
- » Duration: **6 weeks**
- » Certificate: **TECH Technological University**
- » Schedule: **at your own pace**
- » Exams: **online**

Website: www.techtitute.com/us/engineering/postgraduate-certificate/construction-operation-electricity-production-generation-power-plants

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01

Introduction

Before undertaking the construction of an electricity generating plant, it is necessary to know what type of contracting is used for its execution. Therefore, TECH has designed this program where the different types of contracting that exist, with their different characteristics, are analyzed. In addition, due to the rise of renewable energies and international agreements on emissions of pollutants into the atmosphere, he understands how these are integrated into the Electricity Market, an essential issue today. In addition, the guidelines to be followed to optimize the operation of the different power generating plants, the different types of failures to which they may be subjected and the various maintenance strategies that exist are addressed.





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Due to its economic importance, in this program you will learn how the life cycle of electricity generating plants evolves, with a view to an optimal construction and operation"

In order to approach the construction of an electric power generating plant, it is necessary to know what type of contracting is used for its execution. Therefore, this Postgraduate Certificate in Construction and Operation of Electricity Production and Generation Power Plants analyzes the different types of contracting that exist, with their different characteristics.

In view of the boom in renewable energies and the international agreements on emissions of pollutants into the atmosphere, we will see how these are integrated into the Electricity Market. Likewise, the student will learn to analyze the maintenance guidelines to which the different types of existing steam generators are subjected.

On the other hand, it covers in detail the maintenance to be performed on turbines and engines to optimize their productivity and operation. Thus, the program addresses the guidelines to be followed to optimize the operation of wind farms, the different types of failures to which they may be subjected and the various maintenance strategies that exist.

Likewise, the maintenance of nuclear power plants is evaluated at the level of structures, systems and components; together with the criteria and evaluation of their performance. The maintenance to be carried out on the different elements that are part of the photovoltaic production plants is also structured. At the same time, the program will also go in depth into the optimization of the maintenance of the different equipment that make up a hydraulic power plant.

Due to its economic importance, the life cycle of electricity generating plants is described in detail. Finally, the associated energy evacuation system that every power generation plant must have, together with the associated protections, is analyzed.

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 Construction and Operation of Electricity Production and Generation Power Plants** contains the most complete and up-to-date scientific 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 learn how to perform maintenance to optimize the performance of steam generators"

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You will learn how to select the most beneficial contract modality for the construction of an energy production 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.

You will correctly analyze how the exploitation of renewable energies affects the Electricity Market thanks to the keys that the best experts have included in the syllabus of this program.

You will know how to draw up a maintenance plan for a wind farm and how to execute and design the maintenance plan for a photovoltaic plant with guaranteed success.



02

Objectives

The Postgraduate Certificate in Construction and Operation of Electricity Production and Generation Power Plants is aimed at providing the student with the necessary skills regarding everything that such a process entails, with the latest updates and the most innovative aspects of the sector with a view to a new, more sustainable industry. 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 study the profitability of a production plant by analyzing its life cycle with the tools provided by the best professionals in the sector in this unique TECH Postgraduate Certificate"



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

- ◆ Select the most beneficial type of contract for the construction of a power production plant
- ◆ Analyze how the exploitation of renewable energies affects the Electricity Market
- ◆ Perform maintenance to optimize the performance of the steam generators
- ◆ Diagnose failures in gas and steam turbines and reciprocating engines
- ◆ Elaborate the maintenance plan of a wind farm
- ◆ Execute and design the maintenance plan of a photovoltaic plant
- ◆ Study the profitability of a production plant by analyzing its life cycle
- ◆ In-depth knowledge of the elements attached to an electric power production plant for its discharge to the distribution network



Get to know in depth the elements attached to an electric power production plant for its discharge to the distribution network thanks to the content of this TECH Postgraduate Certificate"

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 construction and operation of production plants and power generation 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 program, with the guarantees required to specialize in a sector in full update and innovation, so they will reflect on the different energy production technologies with accuracy and precision to apply it in the transition to a quality and sustainable industry, which uses natural resources efficiently.





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The power generation and production sector needs you. Take this TECH program and join the change by promoting best practices in the design of the power plants of the future"

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 focused on the construction and operation of power generation and production plants, thanks to their knowledge and experience in a complete and updated syllabus, oriented towards the operation of renewable energies and the maintenance of the different power plants. The syllabus includes all the information students need to be competent in their day-to-day work in this sector, with an entrepreneurial mindset, analytical skills and mastery of the techniques and related technologies.





“Expand your knowledge in the construction and operation of energy production plants with this TECH Postgraduate Certificate”

Module 1. Construction and Operation of Electric Power Production Plants

- 1.1. Construction
 - 1.1.1. EPC
 - 1.1.2. EPCM
 - 1.1.3. Open Book
- 1.2. Exploitation of Renewable Energy in the Electricity Market
 - 1.2.1. Increase in Renewable Energies
 - 1.2.2. Market Failures
 - 1.2.3. New Tendencies in Markets
- 1.3. Steam Generator Maintenance
 - 1.3.1. Water Pipes
 - 1.3.2. Steam Pipes
 - 1.3.3. Recommendations
- 1.4. Turbine and Motor Maintenance
 - 1.4.1. Gas Turbines
 - 1.4.2. Steam Turbines
 - 1.4.3. Alternative Motors
- 1.5. Wind Park Maintenance
 - 1.5.1. Types of Faults
 - 1.5.2. Component Analysis
 - 1.5.3. Strategies
- 1.6. Nuclear Power Plant Maintenance
 - 1.6.1. Structures, Systems and Components
 - 1.6.2. Behavioral Criteria
 - 1.6.3. Behavioral Assessment





- 1.7. Maintenance of Photovoltaic Power Plants
 - 1.7.1. Panels
 - 1.7.2. Inverters
 - 1.7.3. Energy Evacuation
- 1.8. Hydraulic Plant Maintenance
 - 1.8.1. Catchment
 - 1.8.2. Turbine
 - 1.8.3. Generator
 - 1.8.4. Valves
 - 1.8.5. Cooling
 - 1.8.6. Oleohydraulics
 - 1.8.7. Regulation
 - 1.8.8. Rotor Braking and Lifting
 - 1.8.9. Excitement
 - 1.8.10. Synchronization
- 1.9. Life Cycle of Power Plants
 - 1.9.1. Analysis of Life Cycle
 - 1.9.2. LCA Methodologies
 - 1.9.3. Limitations
- 1.10. Auxiliary Elements in Production Plants
 - 1.10.1. Evacuation Lines
 - 1.10.2. Electrical Substation
 - 1.10.3. Protections

“ 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.





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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.



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

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 Construction and Operation of Electricity Production and Generation Power Plants in addition to the most rigorous and up-to-date training, access to a Postgraduate Certificate issued by TECH Technological University.



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*Successfully complete this master's
and receive your diploma without
travel or laborious paperwork"*

This **Postgraduate Certificate in Construction and Operation of Electricity Production and Generation Power Plants** contains the most complete and up-to-date scientific 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 diploma issued by **TECH Technological University** will specify the qualification obtained through the Postgraduate Certificate, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Postgraduate Certificate in Construction and Operation of Electricity Production and Generation Power Plants**

Official N° of Hours: **150 h.**



*Apostille Convention. In the event that the student wishes to have their paper diploma 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

tech technological
university

personalized service innovation

knowledge present
online courses

development languages

classroom

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Postgraduate Certificate

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