

# Postgraduate Certificate Electromechanical Installations on Roads





## Postgraduate Certificate Electromechanical Installations on Roads

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

Website: [www.techtute.com/pk/engineering/postgraduate-certificate/electromechanical-installations-roads](http://www.techtute.com/pk/engineering/postgraduate-certificate/electromechanical-installations-roads)

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# 01

# Introduction

This program on Electromechanical Installations deals with this type of installation from the point of view of both commissioning and subsequent maintenance. It is worth noting the course's innovative approach for this type of program, both in terms of its length and its format. Today's highway engineer must necessarily have a sound knowledge of the installations that they govern.





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*You will learn how to perform effective maintenance of installations based on a combination of corrective and preventive maintenance, with emphasis on predictive maintenance”*

Highways are an indispensable part of the transportation network, both for people and goods. These transportation routes have been indispensable since the origins of civilization, since they encourage the progress of peoples.

This program covers fundamental concepts, including the different treatment of opencast installations compared to tunnel installations, due to the peculiarities of this type of infrastructure. Finishing this initial topic with an approach to predictive maintenance that, in spite of having been discussed at a theoretical level for some years now, has not yet been implemented on the roads with the same intensity as it has in other sectors. This type of maintenance has obvious advantages both in terms of sustainability, mainly because if it is correctly designed it will require fewer resources and the useful life of the equipment will be increased, and in terms of availability and reliability of the installations.

The student will then have to master the different types of installation, basically divided into three large blocks:

- ♦ Electrical installation block. It includes the lighting, the power supply installation itself, as well as the power supply support systems.
- ♦ Mechanical installations block. Also with a strong electrical component, it includes ventilation, pumping stations and fire protection systems.
- ♦ Block for other installations: with special mention to the particle and gas filtering stations due to their relevance to environmental protection.

As main tools, the topics that make up the module have updated technical information, real case studies and of great interest. Always without losing sight of the digital transformation that everyone is going through and in which the road world is no exception.

In addition, as it is a 100% online course, 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 accordance with the current times with all the guarantees to position the professional in a highly demanded area such as road construction.

This **Postgraduate Certificate in Electromechanical Installations on Roads** contains the most complete and up-to-date syllabus on the market. The most important features of the program include:

- ♦ Case studies presented by experts in Highway Engineering
- ♦ A deeper understanding of the management of resources for highway projects
- ♦ The graphic, schematic, and 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



*You will delve deeper into some of the unique maintenance operations with this highly scientifically rigorous program"*

“ *A high quality program that will allow you to acquire in-depth knowledge of everything related to Electromechanical Installations on Roads* ”

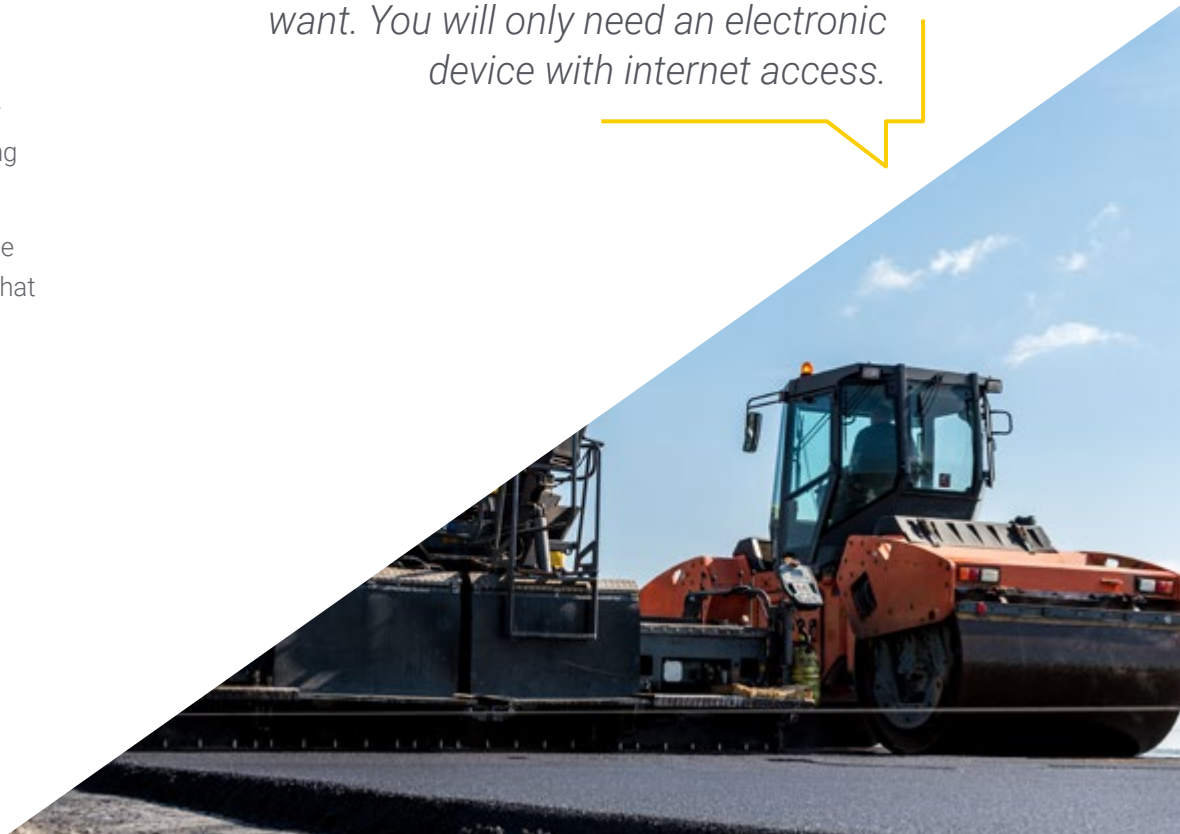
The program's teaching staff includes professionals from sector who contribute their work experience to this training program, as well as renowned specialists from leading societies and prestigious universities.

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.

*With this high-level program you will analyze the differences between opencast and tunnel lighting systems.*

*As it is an online program, you can study wherever and whenever you want. You will only need an electronic device with internet access.*





# 02

# Objectives

The Postgraduate Certificate in Electromechanical Installations for Roads is designed for students to acquire the in-depth skills required to perform various functions oriented to the management and design of road projects. To this end, we offer a comprehensive syllabus with quality content and highly qualified management that will seek to help the professional achieve all their objectives, therefore, improving not only their qualifications, but also their rank in the sector.







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*An intensive and highly effective program that will allow professionals to make a qualitative leap in their professional practice in the sector”*



## General Objectives

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- ♦ Master the different life phases of a highway and the associated contracts and administrative procedures, both at national and international level
- ♦ Develop detailed knowledge of how a company is managed and the most important management systems.
- ♦ Analyze the different phases in the construction of a highway and the different types of bituminous mixes.
- ♦ Detailed knowledge of the factors that affect the safety and comfort of the road, the parameters that measure it and the possible actions for its correction.
- ♦ Gain an in-depth understanding of the different tunnel construction methods, the most frequent pathologies, and how to establish a maintenance plan.
- ♦ Analyze the singularities of each type of structure, and how to optimize its inspection and maintenance.
- ♦ Gain in-depth knowledge of the different electromechanical and traffic installations in tunnels, their function, operation and the importance of preventive and corrective maintenance.
- ♦ Analyze the assets that comprise a road, what factors should be taken into account in inspections, and what are the actions associated with each one of them
- ♦ Accurately understand the life cycle of the road and associated assets.
- ♦ In-depth breakdown of the factors that affect occupational risk prevention
- ♦ Know the fundamental aspects of the operation of a road in detail: applicable regulations, processing of files or authorizations.
- ♦ Understand how a predictive traffic model is performed and its applications.
- ♦ Mastering the fundamental factors that affect Road Safety
- ♦ Understand precisely how winter maintenance is organized and managed.
- ♦ Analyze the operation of a Tunnel Control Center and how the different incidents are managed.
- ♦ Know in detail the structure of the Operation Manual and the actors involved in tunnel operation.
- ♦ Break down the conditions for defining the minimum conditions under which a tunnel can be operated, and how to establish the associated methodology for fault resolution.
- ♦ In-depth understanding of BIM methodology and how to apply it to each phase: design, construction and maintenance and operation.
- ♦ Make a comprehensive analysis of the most current trends in terms of society, environment and technology: connected vehicle, autonomous vehicle, Smart Roads.
- ♦ Have a firm grasp on the possibilities that some technologies are offering. In this way, combined with the student's experience, it can be the perfect alliance when designing the actual application or improving existing processes.





## Specific Objectives

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- ◆ Analyze the differences between opencast and tunnel lighting systems.
- ◆ In-depth breakdown of the operation and function of the various installations involved in tunnel operation: power supply, ventilation, pumping stations, PCI systems.
- ◆ Perform effective maintenance of the facilities based on a combination of corrective and preventive maintenance, with emphasis on predictive maintenance.

“

*During the Postgraduate Certificate, innovative contents about Electromechanical Installations on Roads will be addressed, which will provide the student with in-depth knowledge in this sector”*



03

# Course Management

The management and teaching staff that TECH has assembled for this Postgraduate Diploma is made up of renowned professionals who bring their years of experience in this field to this program. This way, and acquiring the knowledge of professionals with so much experience, the student will have the guarantees that learning from recognized experts offers when it comes to specializing in a sector that is constantly being updated.







“

*The best specialists in this sector will give you first-hand experience of the reality of this field of work"*

## Management



### Mr. Barbero Miguel, Héctor

- ♦ Head of Safety, Operations and Maintenance at Empresa Mantenimiento y Explotación M30, (API Conservación, Dragados-IRIDIUM and Ferrovial Servicios)
- ♦ Somport Bi-national Tunnel Operations Manager
- ♦ Head of COEX in one of the Areas of the Provincial Council of Bizkaia
- ♦ COEX technician in Salamanca for the maintenance of the roads of the Junta de Castilla y León.
- ♦ Civil Engineer, Alfonso X el Sabio University.
- ♦ Technical Engineer in Public Works from the University of Salamanca.
- ♦ Professional Certificate in Spanish in Digital Transformation by MIT. Partner of EJE&CON
- ♦ He has held various positions in the road maintenance sector under the jurisdiction of the different Administrations.

## Professors

### Ms. Suárez Moreno, Sonia

- ♦ Production Manager at Empresa Mantenimiento y Explotación M30, S.A. (API Conservación, Dragados-IRIDIUM and Ferrovial Servicios)
- ♦ EJE&CON's "Talent without Gender" award for the company's talent development and communication policies.
- ♦ Member of the Conservation Committee of the Technical Road Association (ATC)
- ♦ Civil Engineer from the European University of Madrid.
- ♦ Public Works Engineer, Universidad Politécnica de Madrid.
- ♦ Senior Technician in Occupational Risk Prevention. Occupational Safety and Ergonomics and Applied Psychosociology







# 04

# Structure and Content

The structure of the contents of this program has been designed by a team of professionals in the field of highway engineering, who have contributed their years of experience into this Postgraduate Certificate. So, from 1 module that has valuable, unique and innovative information on the design and construction of roads, the student will be able to acquire knowledge, tools and skills to practice in a booming sector with total success.







“TECH puts the most comprehensive collection of content on the market at your fingertips. You only have to bring your enthusiasm to study”



## Module 1. Electromechanical Installations

- 1.1. Roadside Facilities
  - 1.1.1. Fundamental Concepts
  - 1.1.2. Open Air
  - 1.1.3. In Tunnel
  - 1.1.4. Predictive Maintenance
- 1.2. Open-air Lighting
  - 1.2.1. Installation.
  - 1.2.2. Preventative Maintenance
  - 1.2.3. Corrective Maintenance
- 1.3. Tunnel Lighting
  - 1.3.1. Installation.
  - 1.3.2. Preventative Maintenance
  - 1.3.3. Corrective Maintenance
- 1.4. Power Supply
  - 1.4.1. Installation.
  - 1.4.2. Preventative Maintenance
  - 1.4.3. Corrective Maintenance
- 1.5. Generator Sets and UPS
  - 1.5.1. Installation.
  - 1.5.2. Preventative Maintenance
  - 1.5.3. Corrective Maintenance
- 1.6. Ventilation
  - 1.6.1. Installation.
  - 1.6.2. Preventative Maintenance
  - 1.6.3. Corrective Maintenance







- 1.7. Pumping Stations
  - 1.7.1. Installation.
  - 1.7.2. Preventative Maintenance
  - 1.7.3. Corrective Maintenance
- 1.8. PCI Systems
  - 1.8.1. Installation.
  - 1.8.2. Preventative Maintenance
  - 1.8.3. Corrective Maintenance
- 1.9. Particulate and Gas Filtering Stations
  - 1.9.1. Installation.
  - 1.9.2. Preventative Maintenance
  - 1.9.3. Corrective Maintenance
- 1.10. Other Facilities
  - 1.10.1. On the Evacuation Route
  - 1.10.2. Engines
  - 1.10.3. Transformer Station
  - 1.10.4. Corrosion Control

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*This TECH Postgraduate Certificate in Electromechanical Installations on Roads will make you stand out professionally, boosting your career path towards excellence in the sector”*

05

# Methodology

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

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







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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”*

### Case Study to contextualize all content

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

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



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



## A learning method that is different and innovative

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

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

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

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



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

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





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

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

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

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

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



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



### Study Material

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

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



### Classes

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

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



### Practising Skills and Abilities

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



### Additional Reading

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







#### Case Studies

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



#### Interactive Summaries

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

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



#### Testing & Retesting

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



06

# Certificate

The Postgraduate Certificate in Electromechanical Installations on Roads guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological University.





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*Successfully complete this program  
and receive your university qualification  
without travel or laborious paperwork”*

This **Postgraduate Certificate in Electromechanical Installations on Roads** contains the most complete and up-to-date syllabus on the current 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 in the Postgraduate Certificate, and meets the requirements commonly demanded by labor exchanges, competitive examinations and professional career evaluation committees.

Title: **Postgraduate Certificate in Electromechanical Installations on Roads**

Official N° of Hours: **150 h.**



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



future

health confidence people

education information tutors

guarantee accreditation teaching

institutions technology learning

community commitment

personalized service innovation

knowledge present

development language

virtual classroom

**tech** technological  
university

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