

# Postgraduate Certificate

## The Road of the Future





## Postgraduate Certificate The Road of the Future

- » 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/road-future](http://www.techtute.com/pk/engineering/postgraduate-certificate/road-future)

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# 01

# Introduction

This high-level program delves deeper into The Road of the Future methodology. Students who pass the course will acquire the professional competencies necessary to be in the best position to practice the profession.





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*You will learn in depth about the changes that new technologies will force on the infrastructure or the vehicle, from professionals with years of experience in the sector”*

This Postgraduate Certificate is divided into two main blocks. The first block deals with elements of a more social nature, which the student should be aware of because they are already present in other sectors, but which perhaps appear in an incipient form on the road. This includes issues related to equality or transparency policies, or the treatment of teleworking.

Likewise, the inexcusable concern for the environment that has characterized the road sector for some time now is complemented by other more current approaches such as the circular economy, the energy autonomy of the road or the energy use of the subsoil, mainly linked to subway infrastructures. The third theme deals with some more topical concepts such as corporate social responsibility, or that of administrators, or a reflection on the importance of the road in situations such as the one experienced with COVID19 and its generalized effects on mobility worldwide. These are all current issues, but with a significant impact for the coming years.

The teaching team wanted to include the fourth unit, which is very new for this type of program, because experience shows that there is a generalized deficit in the sector regarding the need to integrate the end client, who we must not forget is the user, in the information on the profession in general.

The second block of the module deals with more technological concepts. Starting with the analysis of the 5G networks that are arriving and that are going to facilitate a revolution on the current conception of roads. As such, the student will be able to delve into the state-of-the-art of topics such as the connected vehicle, or the autonomous vehicle and how both are going to require changes in the competencies of the road professional. In the same way, some of the main projects under the general umbrella known as "Smart Roads" will be discussed in detail. Finally, there is a unit that breaks down technologies that are already beginning to be used in other sectors but will necessarily have a specific application on the roads of the future. We wanted to focus on artificial intelligence, the use of drones or robotics.

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 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 The Road of the Future** 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 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



*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"*

“ *With this high-level program the student will have a firm grasp on the possibilities that some technologies offer 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.

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

*A high quality program that will allow you to acquire in-depth knowledge about everything related to The Road of the Future.*



# 02

# Objectives

The Postgraduate Certificate in The Road of the Future 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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- ◆ Understand precisely how social equity measures enhance competitiveness
- ◆ Prepare for the change in direction that the roadside professional faces in the immediate future
- ◆ Further study of the changes that new technologies will force on the infrastructure or the vehicle
- ◆ Discover how to lead environmentally responsible policies through detailed knowledge of new trends

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*During the course, innovative contents about The Road of the Future 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 Certificate is made up of renowned professionals who bring their years of experience in this field to the 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

### Dr. García García, Antonio

- ◆ Staff Engineer Network Intelligence & Automation en COMMSCOPE/ARRIS
- ◆ Member of the EMEA Network Intelligence & Automation Solution group within the Professional Services business unit
- ◆ He has developed his professional career in different companies in the communications sector at European level such as ONO, Netgear, Telenet, Telindus or Vodafone
- ◆ Computer Systems Technical Engineer Pontifical University of Salamanca

### Mr. Ferrán Íñigo, Eduardo

- ◆ Opening and management of business centers in Madrid, under a franchise system
- ◆ Creation from scratch of a company that installs electric vehicle recharging points
- ◆ Pioneer brand in the market with more than 4 years of life and wide implantation in Madrid and national presence
- ◆ Degree in Business Administration from the University of Salamanca
- ◆ Master's Degree in Business Administration

### Ms. Hernández Rodríguez, Lara

- ◆ Specialist in international railway tenders. In the International Contracting Department of OHL Construction, Barcelona
- ◆ Production Manager at Nuevos Accesos Ampliación Sur. Phase 1A. Port of Barcelona
- ◆ Production Manager. Work on the abutments of the Barranco de Pallaresos viaduct on the Madrid-French border high-speed railway line
- ◆ Degree in Civil Engineering from the Polytechnic University of Madrid. Madrid
- ◆ Expert in Port and Coastal Engineering from the University of Las Palmas de Gran Canaria



# 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 the structure and content that have 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 complete 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. The Road of the Future

- 1.1. Social Equity
  - 1.1.1. Equality Policies
  - 1.1.2. Transparency
  - 1.1.3. Remote work Possibilities
- 1.2. Environment
  - 1.2.1. Circular Economy
  - 1.2.2. Energy Autonomy of the Road
  - 1.2.3. Energy Use of the Subsoil
  - 1.2.4. New Projects under Development
- 1.3. Present Continuous
  - 1.3.1. RSC
  - 1.3.2. Administration Liability
  - 1.3.3. The Road in Pandemic
- 1.4. From Passive to Active Information
  - 1.4.1. The Hyperconnected User
  - 1.4.2. Cross Information with Other Modes of Transportation
  - 1.4.3. RRSS
- 1.5. Operation
  - 1.5.1. Variable Speed Management
  - 1.5.2. Pay-Per-Use
  - 1.5.3. Dynamic Electric Recharging





- 1.6. 5G Networks
  - 1.6.1. Network Description
  - 1.6.2. Network Deployment
  - 1.6.3. Utilities
- 1.7. The Connected Vehicle
  - 1.7.1. Road - Vehicle
  - 1.7.2. Vehicle - Road
  - 1.7.3. Vehicle - Vehicle
- 1.8. Autonomous Vehicle
  - 1.8.1. Fundamental Principles
  - 1.8.2. How Does It Affect the Road?
  - 1.8.3. Services Required
- 1.9. *Smart Roads*
  - 1.9.1. Solar Roads
  - 1.9.2. Roads that Decarbonize
  - 1.9.3. Road and Solar Energy
  - 1.9.4. Asphalt of the Future
- 1.10. Applications at your Fingertips
  - 1.10.1. Artificial Intelligence: Image Recognition
  - 1.10.2. Drones on the Road: From Surveillance to Inspection
  - 1.10.3. Robotics in the Service of Occupational Safety

“ *This TECH Postgraduate Certificate in The Road of the Future will make you stand out professionally, boosting your career path towards excellence in the sector*”

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.

“

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



*Our university is the first in the world 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 Journalism and Communication program from 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 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.

**“** *We are the only online university that offers Harvard materials as teaching materials on its courses”*

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

The case method has been the most widely used learning system among the world's leading business schools for as long as they have existed. 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 we face 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

Our university is the first in the world to combine the Harvard University case studies method with a 100% online learning system based on repetition, combining 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 specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to 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.



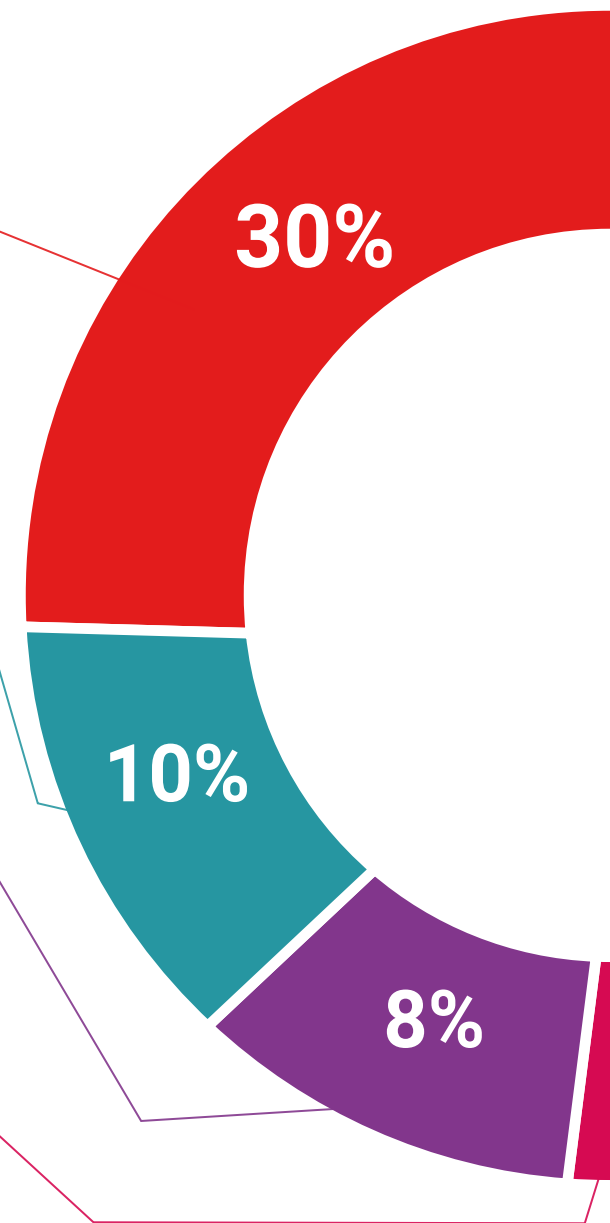
#### Practising Skills and Abilities

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 The Road of the Future 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 certificate without  
the hassle of travel or paperwork”*

This **Postgraduate Certificate in The Road of the Future** contains the most complete and up-to-date scientific 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 in the Postgraduate Certificate, and meets the requirements commonly demanded by labor exchanges, competitive examinations and professional career evaluation committees.

Title: **Postgraduate Certificate in The Road of the Future**

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 quality

development language

virtual classroom

**tech** technological  
university

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## The Road of the Future

