

Postgraduate Certificate Tunnels and Road Works





Postgraduate Certificate Tunnels and Road Works

- » 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/tunnels-road-works

Index

01

Introduction

p. 4

02

Objectives

p. 8

03

Course Management

p. 12

04

Structure and Content

p. 16

05

Methodology

p. 20

06

Certificate

p. 28

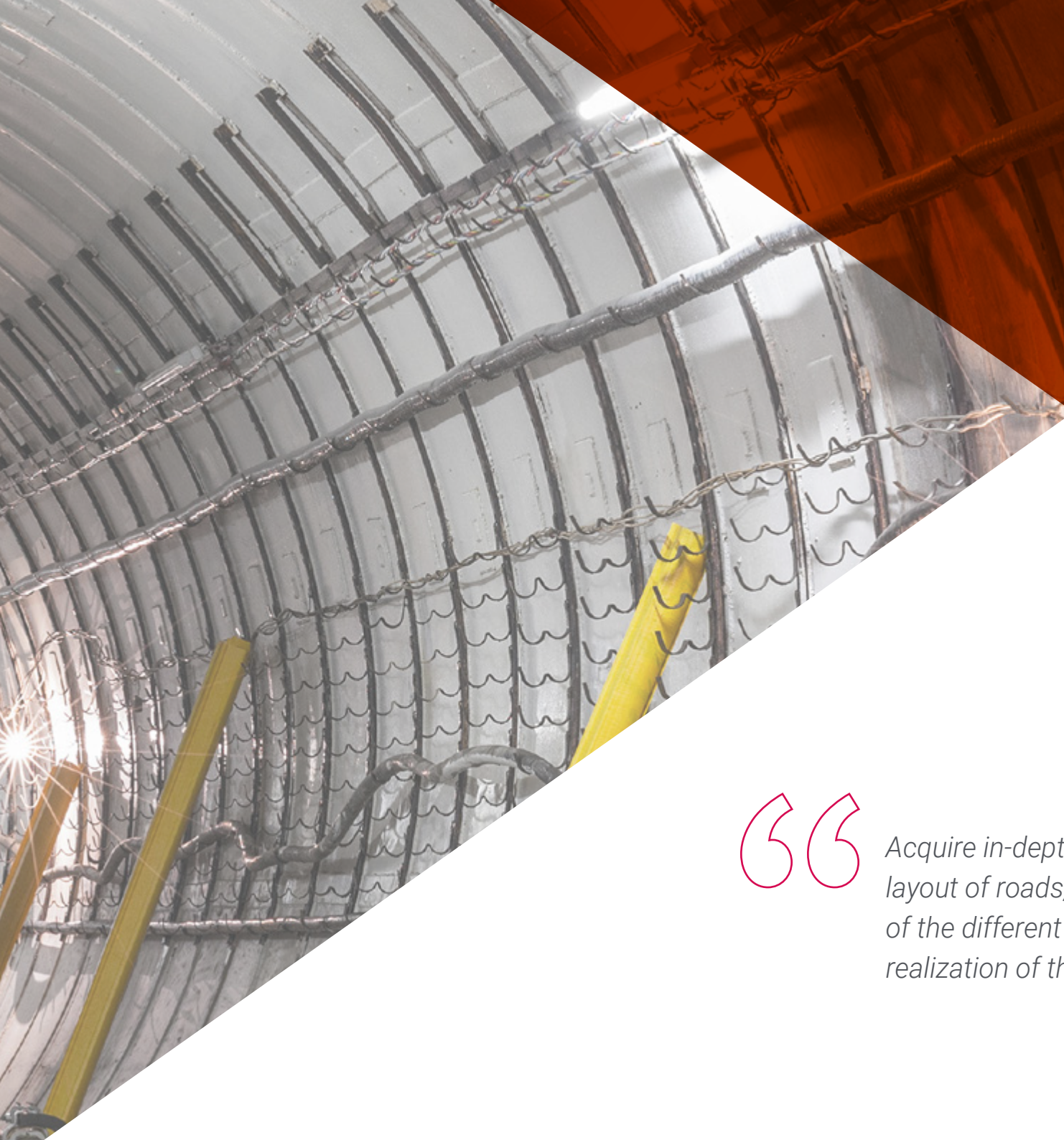
01

Introduction

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 specialize in tunnels and road works, under the guidance of professionals with extensive experience in the sector.

A unique opportunity to specialize in a booming sector with a high demand for professionals.





“

Acquire in-depth knowledge in the design and layout of roads, understanding the importance of the different phases and stages for the realization of the same”

This course is divided into two main blocks. On the one hand, the student will be faced with a major linear infrastructure work such as tunnels. As such, the regulations for both construction and operation will be analyzed, and some of the most significant international references will also be addressed. The main types of tunnels and their most significant characteristics will be discussed in detail. Finally, this block includes, and this is certainly new, both the inventory and inspection of the civil works of the tunnel, as well as the different types of maintenance. All approached from on-site experience and with the use of the latest technologies.

The other block deals with major road works as an essential element of the road as it is the link between the infrastructure and the user. Recycling techniques are covered in detail during two units, aware of the importance that care for the environment must always have in any human activity.

The student will have a unit related to the auscultation of roads, which is particularly relevant as it is the systematized way of assessing the condition of the road surface, and which should serve as a basis for planning the works to be carried out, thereby optimizing investments and, therefore, the environmental impact. The main pavement maintenance works are discussed in depth, as actions aimed at extending the service life of the pavement.

Finally, this block of road works analyzes unique actions related to urban areas, high capacity roads or the use of geogrids and/or geocomposites.

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 Tunnels and Road Works** 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 be able to accurately understand the day-to-day operation of a bituminous mix manufacturing facility. From the dosing and quality marking of the different mixtures, to the study of manufacturing costs and their maintenance”

“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”

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 deeply know everything related to Tunnels and Road Works.

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.



02 Objectives

The Postgraduate Certificate in Tunnels and Road Works is designed for students to acquire the in-depth skills required to perform various functions related to the management and design of projects in the area of roads. 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.



“

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



General Objectives

- ◆ 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
- ◆ Learn about the different electromechanical and traffic installations in tunnels, their function and 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
- ◆ The objective with regard to new technologies is to have a firm grasp of 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

Module 1. Tunnels and road works

- ◆ Analyze the different tunnel construction systems and identify the most common pathologies depending on the construction system used
- ◆ Master the inspection methods, deepen in data collection through destructive and non-destructive techniques, and know how to perform condition assessment
- ◆ Make a comprehensive analysis of the different types of tunnel structural maintenance: ordinary, extraordinary, renovations, rehabilitations and reinforcements and how each is managed
- ◆ Understand the parameters that accurately measure the safety, comfort, capacity and durability of a pavement
- ◆ In-depth knowledge of pavement monitoring and inspection systems
- ◆ Discuss the actions that can be taken to correct the various parameters of pavements in detail

“

Professional growth that will give you the upgrade boost you've been looking for"



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

Mr. Fernández Díaz, Álvaro

- ♦ Area delegate at trabajos Bituminosos SLU
- ♦ Civil Engineering at the E.T.S.I. de Caminos, C. y P. of the Polytechnic University of Madrid.
- ♦ Course on occupational risk prevention for managers of construction companies. Taught by the Construction Labor Foundation
- ♦ Motivation, teamwork and leadership course. Delivered by Fluxá Training and Development



Mr. Navascués Rojo, Maximiliano

- ◆ Works Group Leader at the multinational company DRAGADOS
- ◆ Civil Engineer by the Polytechnic University of Madrid and Master in Tunnels and Underground Works by the Spanish Association of Tunnels and Underground Works
- ◆ Master's Degree in E-business and E-Commerce from the Comillas Pontificia University ICAI-ICADE
- ◆ Executive-MBA from Business School
- ◆ PMP (Project Management Professional) certificate by the Project Management Institute

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. Tunnels and road works

- 1.1. Recycling and In-Situ Stabilization of Pavements with Cement and/or Lime
 - 1.1.1. Stabilized in Situ with lime
 - 1.1.2. Stabilized in Situ with Cement
 - 1.1.3. In-situ Recycling of Concrete Pavements
- 1.2. Recycling of Bituminous Mixtures
 - 1.2.1. Recycling Machinery
 - 1.2.2. In-situ Cold Recycling with Bituminous Emulsion Coatings
 - 1.2.3. Recycling at Plant (RAP)
- 1.3. Pavement Monitoring
 - 1.3.1. Deterioration Assessment
 - 1.3.2. Surface Regularity
 - 1.3.3. Pavement Adhesion
 - 1.3.4. Deflections
- 1.4. Maintenance Operations on Pavements
 - 1.4.1. Repair of Damage
 - 1.4.2. Surface Rejuvenation and Renewal of the Wearing Course
 - 1.4.3. CRT Correction
 - 1.4.4. IRI Correction
 - 1.4.5. Pavement Rehabilitation
- 1.5. Singular Actions
 - 1.5.1. Asphalt Operation in Urban Areas
 - 1.5.2. Actions on High-Capacity Roads
 - 1.5.3. Use of Geogrids and/or Geocomposites
- 1.6. Tunnels. Regulations
 - 1.6.1. Construction
 - 1.6.2. Operation
 - 1.6.3. International
- 1.7. Tunnel Typology
 - 1.7.1. Open Air
 - 1.7.2. In Mine
 - 1.7.3. With Tunnel Boring Machine





- 1.8. General Characteristics of the Tunnel
 - 1.8.1. Excavation and Support
 - 1.8.2. Waterproofing and Coating
 - 1.8.3. Tunnel Drainage
 - 1.8.4. International Singularities
- 1.9. Tunnel Inventory and Inspection
 - 1.9.1. Inventory
 - 1.9.2. Laser Scanners
 - 1.9.3. Thermography
 - 1.9.4. Geo-Radar
 - 1.9.5. Passive Seismic
 - 1.9.6. Refraction Seismic
 - 1.9.7. Pits
 - 1.9.8. Drilling and Coring
 - 1.9.9. Coating Coring
 - 1.9.10. Condition Assessment
- 1.10. Tunnel Maintenance
 - 1.10.1. Ordinary Maintenance
 - 1.10.2. Extraordinary Maintenance
 - 1.10.3. Renovation Operations
 - 1.10.4. Rehabilitation
 - 1.10.5. Reinforcements



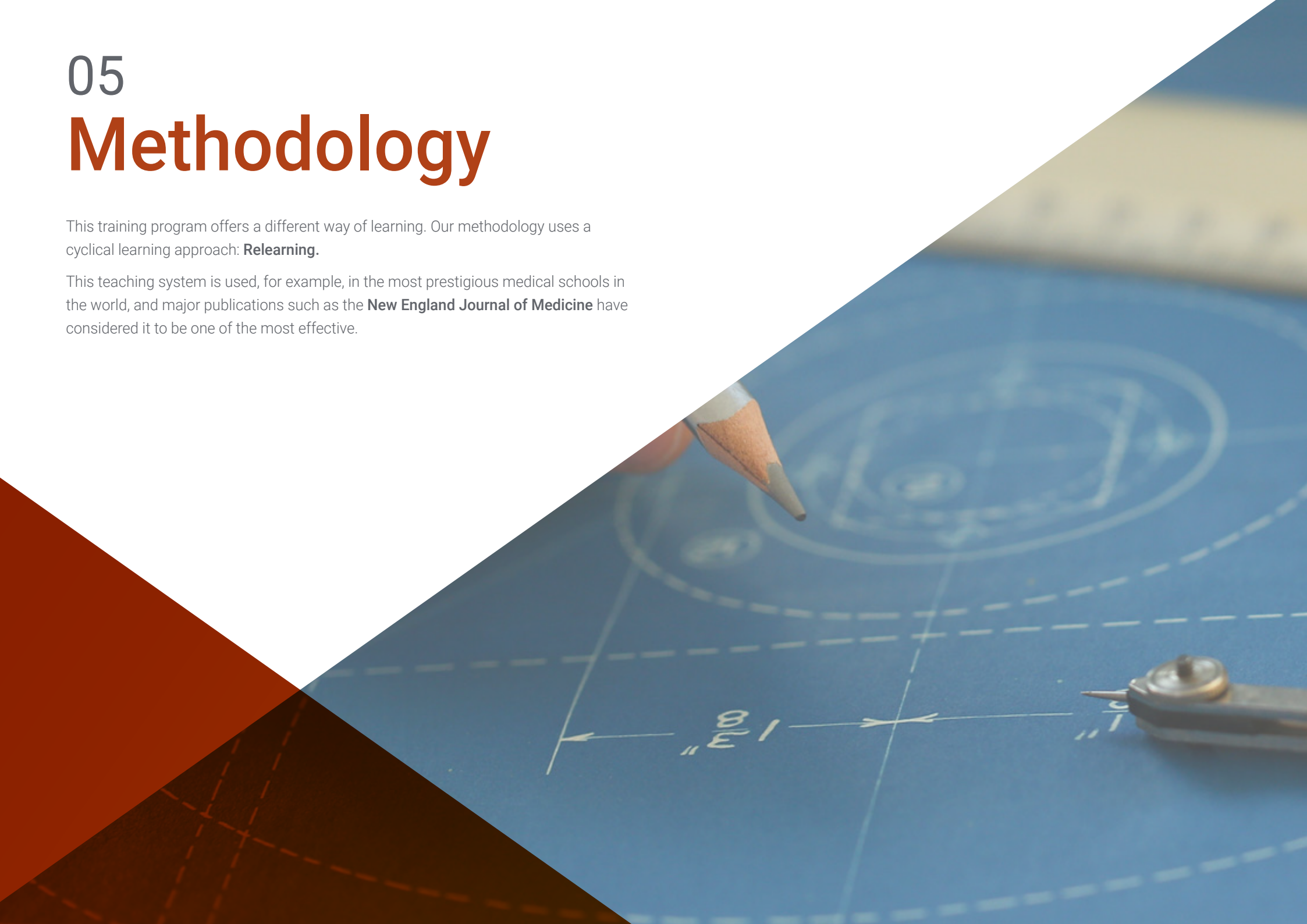
This TECH Postgraduate Certificate in Tunnels and Road Works will make you stand out professionally, boosting your career path towards excellence in the sector"

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.





“

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.



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 Tunnels and Road Works guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological University.



“

Successfully complete this training and receive your diploma without the hassle of travel or paperwork"

This **Postgraduate Certificate in Tunnels and Road Works** contains the most complete and up-to-date syllabus 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 Diploma, and it meets the requirements commonly required by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Postgraduate Certificate in Tunnels and Road Works**

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



Postgraduate Certificate Tunnels and Road Works

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

Postgraduate Certificate Tunnels and Road Works

