

# Postgraduate Certificate BIM for Roads



## Postgraduate Certificate BIM for Roads

- » Modality: online
- » Duration: 6 weeks
- » Certificate: TECH Global University
- » Credits: 6 ECTS
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtitute.com/us/engineering/postgraduate-certificate/bim-roads](http://www.techtitute.com/us/engineering/postgraduate-certificate/bim-roads)

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# 01

# Introduction

This high-level training provides an in-depth understanding of the BIM methodology for roads, in order to provide the student with the knowledge required to address this transformation in their professional performance. The student will develop an understanding of the BIM methodology, which goes far beyond the mere use of one software or another.





*You will learn how to delve deeper into the BIM concept and make the decision on which commercial software to use"*

The BIM methodology basically consists of the creation of a collaborative work platform that allows all the actors involved in the road project to have coherent and grouped information available.

BIM must be implemented in the different phases of the road. In construction, it is usually simpler as it does not start from a pre-existing information structure. For this reason, we devoted detailed attention to the implementation of the BIM methodology in an infrastructure already in service, something that is particularly new in this type of study.

Since the use of BIM has a greater background in other types of infrastructures, a specific topic has been included that addresses this knowledge in order to facilitate the student's learning process through the observation of other experiences.

In the last block, which contains three units, the student will delve deeper into the concepts of the digital twin, awaken interest in other skills that highway professionals should have, such as the use of databases, programming concepts centered on Python, or Big Data techniques. Finally, the block reviews the main 3D visualization technologies such as 3D printing, virtual reality/augmented reality or point cloud.

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 BIM for 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 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 you will learn how to approach BIM implementation in both projects and pre-existing infrastructures”*

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 of everything related to BIM for Roads.*



# 02

# Objectives

The Postgraduate Certificate in BIM 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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- ◆ Gain insight into the BIM concept and distinguish it from simply deciding which commercial software to use
- ◆ Delve into the different levels of implementation
- ◆ Be prepared to address BIM implementation in both projects and pre-existing infrastructure
- ◆ Analyze the technologies that complement the BIM philosophy

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*During the course, innovative contents about BIM for 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.





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*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

### 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

### 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. 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

# 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.





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*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. BIM for Roads

- 1.1. Origins of Information
  - 1.1.1. Project Documentation
  - 1.1.2. Network Inventory
  - 1.1.3. CMMS
  - 1.1.4. ITS
- 1.2. BIM at the Conceptual Level
  - 1.2.1. Applicable Regulations
  - 1.2.2. Description of BIM Methodology
  - 1.2.3. BIM Advantages
- 1.3. Implementation of the BIM Methodology in an In-Service Infrastructure
  - 1.3.1. Coding Assets
  - 1.3.2. Documentation Coding
  - 1.3.3. Attribute Dictionary
  - 1.3.4. IFCs
- 1.4. The BIM Model in Maintenance and Operation
  - 1.4.1. Integration of the Different Platforms
  - 1.4.2. The Importance of Document Management
  - 1.4.3. Knowledge of the State of the Infrastructure
- 1.5. BIM Experiences in other Infrastructures
  - 1.5.1. BIM in Railroads
  - 1.5.2. BIM in Building
  - 1.5.3. BIM in Industry





- 1.6. BIM Software
  - 1.6.1. Plan
  - 1.6.2. Open BIM
  - 1.6.3. Modeling
- 1.7. BIM Management
  - 1.7.1. ISO 19650
  - 1.7.2. BIM manager
  - 1.7.3. The Role of the BIM
- 1.8. Digital Twin
  - 1.8.1. Description
  - 1.8.2. Operation
  - 1.8.3. Advantages
- 1.9. Other Skills to be Developed by the Roadside Professional
  - 1.9.1. Databases
  - 1.9.2. Python Programming
  - 1.9.3. Big Data
- 1.10. New Technologies
  - 1.10.1. 3D Printing
  - 1.10.2. Virtual Reality, Augmented Reality
  - 1.10.3. Point Cloud

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*This TECH Postgraduate Certificate in BIM for Roads 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.

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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 Global 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 Global 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.



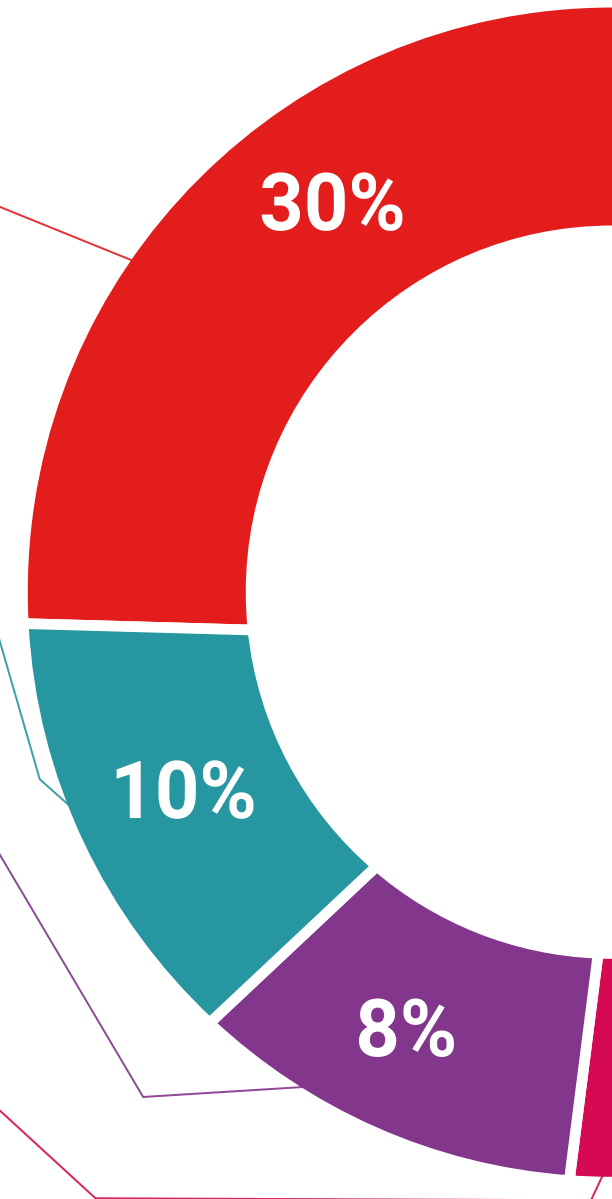
#### Practising Skills and Abilities

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 **BIM for Roads** guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by **TECH Global University**.



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*Successfully complete this program and receive your diploma without the hassle of travel or paperwork”*

This program will allow you to obtain your **Postgraduate Certificate in BIM for Roads** endorsed by **TECH Global University**, the world's largest online university.

**TECH Global University** is an official European University publicly recognized by the Government of Andorra ([official bulletin](#)). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in BIM for Roads**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**



\*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH Global University 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** global  
university

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