

Internship Program

Road Construction, Maintenance and Operation



Internship Program

Road Construction, Maintenance
and Operation

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01 Introduction

Efficient road operation is essential to ensure traffic flow and user safety. Given the growth of the vehicle fleet and the complexity of road networks, it is essential that engineering professionals implement advanced technologies and effective management strategies in their daily practice. In this way, they will use tools such as intelligent transportation systems or traffic automation to reduce accidents and improve the drivers' experience. To facilitate this work, TECH presents a revolutionary qualification consisting of a 3-week practical stay in a reference institution, where engineers will deepen in the latest developments that have emerged in this area and acquire skills to manage them effectively.

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*Thanks to this Internship Program,
you will be highly qualified to design,
analyze and evaluate road projects”*





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A recent report by the World Health Organization reports that approximately 1.35 million people die annually in traffic accidents. Against this backdrop, engineers have the responsibility to implement effective management strategies that optimize road safety. To do so, professionals need to have a solid understanding of the most innovative techniques for safe and resilient infrastructure design and maintenance.

Given this scenario, TECH has created an avant-garde practical program that consists of a 120-hour stay in a reference entity in the field of Road Construction, Maintenance and Operation. In this way, during 3 weeks, the graduates will be part of a team of top level experts, with whom they will work actively in tasks such as the execution of pavements, actions on the road surface or traffic facilities, among others. Thanks to this, the students will be able to update their knowledge while gaining new skills to significantly optimize their practice.

Moreover, during this practical stay, graduates will have the support of an assistant tutor, in charge of ensuring that all the requirements established for this Internship Program are met. In this way, the graduates will be able to work with total guarantee and security in the use of the most advanced technology. This will allow them to live an enriching experience that will result in a significant improvement in their professional performance.

02

Why Study an Internship Program?

The Construction, Maintenance and Operation of Roads has become a highly demanded field by companies. This is due to the fact that these infrastructures are the backbone of land transportation, since they facilitate the movement of people and goods. Given this situation, it is essential that engineers keep abreast of all the advances that occur in this field to provide high quality services that improve the quality of life of communities. For this reason, TECH designs a unique and disruptive academic product in the current educational landscape, which will allow engineers to enter a real working environment where they can put into practice the latest procedures in this field.



You will manage preventive and corrective maintenance programs to extend the useful life of viable infrastructures"

1. Updating from the latest technology available

New technologies are significantly transforming road construction, maintenance and operation. These innovations improve the efficiency, safety and sustainability of road projects. In view of this, TECH is developing an Internship Program that will allow graduates to handle the most sophisticated technological tools for their professional practice.

2. Gaining in-depth knowledge from the experience of top specialists

During this Internship Program, the graduates will join a team composed of outstanding professionals in Construction, Maintenance, and Road Exploitation, which will allow them to and Operation of Roads, ensuring the high quality of the program. With the guidance of the tutor who will accompany them during their on-site stay, the graduates will experience a significant improvement in their professional career as engineers.

3. Entering first-class professional environments

TECH meticulously chooses all the centers available for its Internship Programs. Thanks to this, graduates will be guaranteed access to a prestigious environment in the field of Road Construction, Maintenance and Operation. Therefore, engineers will be able to experience first-hand the routine of a demanding, rigorous and detailed area of work, always applying the latest scientific advances in their working methods.

4. Putting the acquired knowledge into daily practice from the very first moment

In academia, there is a clear lack of university programs that provide practical knowledge development. To meet this need, TECH has created an innovative teaching model that will give engineers access to a real working environment for 3 weeks, which will significantly improve their skills in Road Construction, Maintenance and Operation.

5. Expanding the boundaries of knowledge

TECH offers engineers the opportunity to carry out this Internship Program in internationally renowned organizations. In this way, graduates will be able to update their knowledge by collaborating with highly experienced professionals in the field of Road Construction, Maintenance and Operation.



*You will have full practical immersion
at the center of your choice"*



03 Objectives

Through this program, engineers will acquire a holistic knowledge of road design, construction and maintenance. In this sense, graduates will develop project management skills in this area, covering aspects such as planning, programming, quality control and risk management. At the same time, professionals will be able to evaluate soils and select appropriate foundation and soil stabilization techniques.



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





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- ♦ 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



Specific Objectives

- ♦ Analyze the different management systems used for the management of the different assets: pavements, structures, electrical and traffic installations and other elements of the road and the most relevant indicators
- ♦ Develop a deeper understanding of the contractual structure related to roads
- ♦ 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
- ♦ Delve into the day-to-day work of laying bituminous mixes, identifying the essential aspects and the most common difficulties in transport, paving and compacting operations
- ♦ 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
- ♦ Analyze how the life cycle of structures is managed through structure management systems.
- ♦ Understand, in detail, the different types of structural inspection, which players are involved, what methods are used and how the severity index is assessed
- ♦ 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
- ♦ Establish the various systems for detecting incidents in tunnels
- ♦ Know precisely which systems are involved in incident signaling





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- ♦ Gain in-depth knowledge of the existing signaling, beaconing and containment elements on the road, the existing typologies and how their inspection and maintenance is carried out
- ♦ Break down the different enclosure elements and their components, and how they are inspected and maintained
- ♦ Establish the regulations applicable to roads and identify the different road protection zones.
- ♦ Master traffic restrictions and how to manage special transport or sporting events
- ♦ Gain insight into the BIM concept and distinguish it from simply deciding which commercial software to use
- ♦ Delve into the different levels of implementation
- ♦ Understand precisely how social equity measures enhance competitiveness
- ♦ Prepare for the change in direction that the roadside professional faces in the immediate future



*A unique training experience,
key and decisive to boost your
professional development"*

04 Educational Plan

The Internship Program of this university program in Road Construction, Maintenance and Operation consists of a 3-week internship in a distinguished organization, from Monday to Friday, with 8 consecutive hours of practical training with an assistant specialist. During the course of this itinerary, the graduates will have the opportunity to work in a highly demanding work environment, joining a team of professionals specialized in this field who will show them the most recent innovations that have taken place.

In this program proposal, of a completely practical nature, the activities are aimed at developing and perfecting the skills necessary for the provision of Road Construction, Maintenance and Operation services, and are oriented towards specific training for the exercise of the activity.

In this way, engineering professionals have an ideal opportunity to update their knowledge while working with a team of professionals in this field. In this way, graduates will acquire both the knowledge and the skills they need to significantly optimize their practice and thus make a quality leap in their professional career.

Practical teaching will be carried out with the active participation of the student performing the activities and procedures of each area of competence (learning to learn and learning to do), with the accompaniment and guidance of teachers and other training partners that facilitate teamwork and multidisciplinary integration as transversal competencies for the praxis of Construction, Maintenance and Operation of Roads (learning to be and learning to relate).





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The procedures described below will be the basis of the practical part of the program, and their implementation will be subject to the center's own availability and workload, the proposed activities being the following:

Module	Practical Activity
Business Management	Draft construction contracts to ensure that all technical, legal and financial specifications are well defined
	Prepare competitive bids and proposals for construction projects, ensuring that they comply with client requirements and current regulations
	Conduct market research to identify new business opportunities and areas for expansion
	Develop and manage project budgets, tracking costs and financial control
Pavement Layout, Grading and Installation Procedures	Conduct detailed topographic surveys to understand terrain characteristics and plan the layout of highways, roads, and other infrastructure
	Evaluate different layout alternatives considering factors such as environmental impact, construction costs, and technical feasibility
	Use specialized software to create plans and models of the proposed layout, facilitating visualization and adjustments as required
	Supervise the marking of the layout on the ground, ensuring that the designed lines and levels are followed
Underground Pipelines	Conduct geotechnical studies to assess soil and rock characteristics, determining stability and conditions for tunnel excavation
	Select the most appropriate excavation methods, such as drilling, blasting and tunnel boring machines
	Monitor and control excavation-induced vibration and settlement to protect nearby structures
	Execute drainage systems to manage water infiltration and maintain tunnel stability
Traffic Infrastructure	Use traffic simulation software to model traffic behavior and plan effective solutions
	Design the placement of traffic signals, road markings, traffic lights and other control signals
	Plan intersections, traffic circles, and crosswalks that improve both traffic flow and safety
	Coordinate the installation of sensors, surveillance cameras, and monitoring systems for intelligent traffic management

05

Where Can I Do the Internship Program?

Committed to offering high quality programs, TECH carries out a rigorous selection of the institutions available for its students' Internship Programs. Through this careful process, internationally renowned institutions have been chosen. Therefore, engineers will have the opportunity to carry out their on-site learning in first class facilities, with the support of a work team made up of real experts in the field of Road Construction, Maintenance and Operation.

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You will carry out your Internship Program in a reference institution in Road Construction, Maintenance and Operation”





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The student will be able to do this program at the following centers:



Engineering

Cones

Country	City
Spain	Madrid

Address: Calle Zinc, 3, Humanes de Madrid,
28970. Madrid

A prestigious construction company highly specialized in
quality control of materials and geotechnical studies.

Related internship programs:

- Geotechnics and Foundations
- Acoustic Engineering





Engineering

Lo Bruno Estructuras S.A.

Country	City
Argentina	Santiago del Estero

Address: Fray L. Beltrán y 1° Teniente
Ardiles, Parque Industrial - La Banda,
Santiago del Estero

Company specialized in the manufacture of
construction materials

Related internship programs:

- MBA in Commercial Sales Management
- Infrastructure and Civil Engineering





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You will learn firsthand the reality of working in the area, in a demanding and rewarding environment”

06

General Conditions

Civil Liability Insurance

This institution's main concern is to guarantee the safety of the students and other collaborating agents involved in the internship process at the company. Among the measures dedicated to achieve this is the response to any incident that may occur during the entire teaching-learning process.

To this end, this entity commits to purchasing a civil liability insurance policy to cover any eventuality that may arise during the course of the internship at the center.

This liability policy for interns will have broad coverage and will be taken out prior to the start of the practical learning period. That way professionals will not have to worry in case of having to face an unexpected situation and will be covered until the end of the internship program at the center.



General Conditions of the Internship Program

The general terms and conditions of the internship program agreement shall be as follows:

1. TUTOR: During the Internship Program, students will be assigned with two tutors who will accompany them throughout the process, answering any doubts and questions that may arise. On the one hand, there will be a professional tutor belonging to the internship center who will have the purpose of guiding and supporting the student at all times. On the other hand, they will also be assigned with an academic tutor, whose mission will be to coordinate and help the students during the whole process, solving doubts and facilitating everything they may need. In this way, the student will be accompanied and will be able to discuss any doubts that may arise, both clinical and academic.

2. DURATION: The internship program will have a duration of three continuous weeks, in 8-hour days, 5 days a week. The days of attendance and the schedule will be the responsibility of the center and the professional will be informed well in advance so that they can make the appropriate arrangements.

3. ABSENCE: If the students does not show up on the start date of the Internship Program, they will lose the right to it, without the possibility of reimbursement or change of dates. Absence for more than two days from the internship, without justification or a medical reason, will result in the professional's withdrawal from the internship, therefore, automatic termination of the internship. Any problems that may arise during the course of the internship must be urgently reported to the academic tutor.

4. CERTIFICATION: Professionals who pass the Internship Program will receive a certificate accrediting their stay at the center.

5. EMPLOYMENT RELATIONSHIP: The Internship Program shall not constitute an employment relationship of any kind.

6. PRIOR EDUCATION: Some centers may require a certificate of prior education for the Internship Program. In these cases, it will be necessary to submit it to the TECH internship department so that the assignment of the chosen center can be confirmed.

7. DOES NOT INCLUDE: The Internship Program will not include any element not described in the present conditions. Therefore, it does not include accommodation, transportation to the city where the internship takes place, visas or any other items not listed.

However, students may consult with their academic tutor for any questions or recommendations in this regard. The academic tutor will provide the student with all the necessary information to facilitate the procedures in any case.

07 Certificate

This **Internship Program in Road Construction, Maintenance and Operation** contains the most complete and up-to-date program in the professional and academic landscape.

After the student has passed the assessments, they will receive their corresponding **Internship Program** diploma issued by **TECH Technological University** via tracked delivery*.

The diploma issued by TECH will reflect the grade obtained in the test.

Title: **Internship Program in Road Construction, Maintenance and Operation**

Duration: **3 weeks**

Attendance: **Monday to Friday, 8-hour shifts, consecutive shifts**



future
health confidence people
education information tutors
guarantee accreditation teaching
institutions technology learning
community commitment
personalized service innovation
knowledge present quality
development languages
virtual classroom



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