

Postgraduate Certificate Deep Foundations





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Course Modality: Online

Duration: 6 weeks

Certificate: TECH - Technological University

6 ECTS Credits

Teaching Hours: 150 hours.

Website: www.techtitute.com/us/engineering/postgraduate-certificate/deep-foundations

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01

Introduction

During the course of this specialization, a detailed description of the loads to which these types of foundations are subjected and their structural response will be made. In this sense, deep foundations have accessory elements that are important for the operation of the whole, such as pile caps, the dimensioning and construction of which is also the subject of this complete Postgraduate Certificate. These contents will allow the professional to perform an original and application-oriented analysis of the theoretical concepts developed throughout the Postgraduate Certificate, in such a way that they will unequivocally become a much more capable and sought-after professional.





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Thanks to this very complete Postgraduate Certificate you will learn about the most significant characteristics of Deep Foundations and you will grow in your profession"

The **Postgraduate Certificate in Deep Foundations** is academically designed to provide in-depth knowledge, based on advanced concepts already acquired in the world of civil engineering and from a practical application point of view, of the most important geotechnical aspects that can be found in different types of civil works.

Any deep foundation has accessory elements that are important for the operation of the whole, such as the pile caps, whose dimensioning and construction is also the subject of this module.

The topics that make up this part of the Postgraduate Certificate also address the limitations of this type of foundation by presenting cases of sizing and repair of deep foundations with faults.

This Postgraduate Certificate in Deep Foundations integrates the most complete and innovative educational program in the current market in terms of knowledge and latest available technologies, in addition to encompassing all the sectors or parties involved in this field. In addition, the Postgraduate Certificate consists of exercises based on real cases of situations currently managed or previously faced by the teaching team.

All this, through a 100% online specialization that provides the student with the ease of being able to take it wherever and whenever they want. All you need is a device with internet access, and you will be able to access a universe of knowledge that will be the main asset of the engineer when positioning themselves in a sector that is increasingly in demand by companies in various sectors.

This **Postgraduate Certificate in Deep Foundations** is the most comprehensive and up-to-date educational program on the market. The most important features of the specialization are:

- ♦ The development of practical cases presented in Courses in Civil and Geotechnical Engineering
- ♦ The graphic, schematic, and eminently 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 process of self-assessment can be used to improve learning
- ♦ Its special emphasis on innovative methodologies
- ♦ Theoretical lessons, questions to the course, discussion forums on controversial issues and individual reflection papers.
- ♦ Content that is accessible from any fixed or portable device with an Internet connection



Apply the latest advances in this field and give your curriculum a boost of value thanks to this very complete Postgraduate Certificate from TECH"

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You will be provided with innovative teaching materials and resources that will facilitate the learning process and the retention of the contents learned for a longer period of time"

A 100% online specialization that will allow you to combine your studies with the rest of your daily activities

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

Its Multimedia Content, elaborated with the latest Educational Technology, will allow the Professional a situated and contextual learning, that is to say, a Simulated Environment that will provide an immersive specialization programmed 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 engineering experts.



02

Objectives

TECH has designed this comprehensive Postgraduate Certificate with the aim of training engineering professionals to be able to design, implement and work on Civil Works, knowing everything related to this industry and technical and professional aspects at the national and international level that directly affect it. To this end, specific aspects of the profession that stand out for their enormous importance in today's business landscape will be addressed, and for which large corporations are increasingly demanding competent engineers with a solid specialized training.





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TECH pursues only one goal with its specializations: to catapult students toward professional success”



General Objectives

- ◆ Delve deeper into kinds of grounds, not only in their typology but also in their behavior Not only in the evident differentiation of stresses and deformations of soils and rocks, but also under particular but very common conditions, such as the presence of water or seismic disturbances.
- ◆ Efficiently recognize the needs for soil characterization, being able to design campaigns with the optimal means for each type of structure, optimizing and giving added value to the study of materials
- ◆ Identify the behavior of slopes and semi-subterranean structures such as foundations or walls in their different typologies This complete identification must be based on understanding and being able to anticipate the behavior of the terrain, the structure and its interface Know in detail the possible faults that each set can produce and as a consequence have a deep understanding of the repair operations or improvement of materials to mitigate damage
- ◆ Receive a complete tour of tunnel and gallery excavation methodologies, analyzing all drilling procedures, design constraints, support and lining

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A training designed based on practical cases that will teach you how to act in real situations in the daily practice of your profession"





Specific Objectives

- ◆ Acquire a detailed knowledge of piles as deep foundation elements, analyzing all their characteristics, construction typologies, auscultation capacity, types of failure, etc
- ◆ Review other deep foundations of more specific use, for special structures, pointing out those types of projects in which they are used and with very particular practical cases
- ◆ Analyze the major enemies of this type of foundations, such as negative friction or loss of tip resistance, among others
- ◆ Have a high degree of knowledge of deep foundation repair methodologies and auscultation, both initial execution and repairs
- ◆ Measure and size in a correct way and according to the particular characteristics of the work, the appropriate deep foundations
- ◆ Complete the study of deep foundations with the upper bracing elements and their grouping, with a clear development of the structural dimensioning of the pile caps

03

Course Management

TECH applies a criterion based on high quality in all its specializations. This guarantees students that by studying here they will find the best didactic content taught by the best professionals in the sector. In this sense, this Postgraduate Certificate in Deep Foundations counts on highly prestigious professionals in this field, who bring to the training the experience of their years of work, as well as the knowledge acquired from research in the field. All to provide the engineer with a high-level program, which will enable them to practice in national and international environments with greater guarantees of success.





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The best teachers are at the best university. Don't miss this great specialization opportunity”

Management



Mr. Estébanez Aldona, Alfonso

- ◆ Civil Engineer graduated from the Polytechnic University of Madrid.
- ◆ Studying the E.T.S.I. Ph.D Roads, Canals and Ports U.P.M. in the Department of Terrain Engineering.
- ◆ Course of Health and Safety Coordinator in Construction Works registered by the CAM nº 3508.
- ◆ Engineering and Technical Director at ALFESTAL
- ◆ International Consultant and Project Manager at D2
- ◆ Project Manager in the Department of Tunnels and Underground Works in Inarsa S.A
- ◆ Assistant Technician in the Geology and Geotechnical Department of Intecsa-Inarsa.

Professors

Mr. Sandin Sainz-Ezquerro, Juan Carlos

- ◆ Specialist in the calculation of structures and foundations, fields in which he has developed his entire professional career over the last 25 years.
- ◆ Civil Engineer graduated the ETSI of, Canals and Ports from the Polytechnic University of Madrid (U.P.M.).
- ◆ Studying the E.T.S.I. Ph.D Roads, Canals and Ports U.P.M. in the Structures Department.
- ◆ Course on integration of BIM technology in structural design 2017.
- ◆ Lecturer in the BIM Master developed at the Colegio de Caminos 2019.
- ◆ Technical assistance for SOFISTIK AG for Spain and Latin America, finite element modeling software for terrain and structures.

Mr. Clemente Sacristan, Carlos

- ◆ Civil Engineer graduated from the Polytechnic University of Madrid.
- ◆ Development of large-scale linear works for different administrations (ADIF, Ministry of Public Works, Provincial Council of Vitoria...) being a reference project manager in the field of linear works.
- ◆ Executive at BALGORZA S.A.
- ◆ Occupational risk prevention course for construction company managers.
- ◆ Advanced course in management of large turnkey projects (EPC)

Ms. Lope Martín, Raquel

- ◆ Geological Engineer Complutense University of Madrid UCM
- ◆ PROINTEC Technical Department
- ◆ PROINTEC's technical department has been involved in various projects requiring improvement treatments, both nationally and internationally: jet grouting, gravel columns, vertical drainage, etc.
- ◆ Course on Geotechnics Applied to Building Foundations
- ◆ Course on Technical Control for Property and Casualty Insurance Geotechnics, foundations and structures.

04

Structure and Content

The syllabus of the Postgraduate Certificate is structured as a comprehensive tour through each and every one of the concepts required to understand and work in this field. Thus, through a novel didactic approach, based on the practical application of the contents, the engineer will learn and understand the functioning of geotechnics and foundations, knowing how to design and implement projects in this sense, providing high safety indexes and services to the companies. This, in addition to adding value to your professional profile, will make you a much better prepared professional to work in a variety of environments.





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You will have access to a first class syllabus presented in multimedia format and specially designed to enable you to successfully enter this professional sector”

Module 1. Deep Foundations

- 1.1. Piles: Calculation and Dimensioning
 - 1.1.1. Types of Piles and Their Application to Each Structure
 - 1.1.2. Limitations of Piles Used as Foundations
 - 1.1.3. Pile Calculation as Elements of Deep Foundations
- 1.2. Alternative Deep Foundations
 - 1.2.1. Other Types of Deep Foundations
 - 1.2.2. Particularities of Pile Alternatives
 - 1.2.3. Specific Works That Require Alternative Foundations
- 1.3. Pile Groups And Pile Caps
 - 1.3.1. Limitations of Piles Used as Individual Elements
 - 1.3.2. Pile Caps of Pile Groups
 - 1.3.3. Limitations of Pile Groups and Interactions Between Piles
- 1.4. Negative Friction
 - 1.4.1. Fundamental Principles and Influence
 - 1.4.2. Consequences of Negative Friction
 - 1.4.3. Calculation And Mitigation of Negative Friction
- 1.5. Maximum Capacity and Structural Limitations
 - 1.5.1. Individual Structural Topping of Piles
 - 1.5.2. Maximum Capacity of Pile Groups
 - 1.5.3. Interaction With Other Structures
- 1.6. Faults in Deep foundations
 - 1.6.1. Structural Instability in Deep Foundations
 - 1.6.2. Bearing Capacity of the Terrain
 - 1.6.3. Maximum Ground Capacity
- 1.7. Deep Foundation Repairs
 - 1.7.1. Interventions on Ground
 - 1.7.2. Interventions on Foundations
 - 1.7.3. Unconventional Systems





- 1.8. Pile-Piles in Large Structures
 - 1.8.1. Special Needs in Special Foundations
 - 1.8.2. Mixed Pile-Piles: Types and Uses
 - 1.8.3. Mixed Foundations in Special Structures
- 1.9. Sonic Continuity and Auscultation Checks
 - 1.9.1. Pre-execution Inspections
 - 1.9.2. Checking the Condition of the Casting: Sonic Checks
 - 1.9.3. Auscultation of Foundations During Service
- 1.10. Dimension Software for Foundations
 - 1.10.1. Individual Pile Simulations
 - 1.10.2. Modeling of Pile Caps and Structural Assemblies
 - 1.10.3. Finite Element Methods in the Modeling of Deep Foundations

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A unique learning opportunity that will catapult your career to the next level. Don't let it slip away"

05

Methodology

This training provides you with a different way of learning. Our methodology uses a cyclical learning approach: **Re-learning**.

This teaching system is used 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 Re-learning, 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 you a revolutionary approach to developing your skills and knowledge. Our goal is to strengthen your skills in a changing, competitive, and highly demanding environment.

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With TECH you can experience a way of learning that is shaking the foundations of traditional universities around the world”



Our school 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 Engineering program at TECH- Technological University is an intensive program that prepares you to face all the challenges in this area, both nationally and internationally. The main objective is to promote your personal and professional growth. For this purpose, we rely on the case studies of Harvard Business School, with which we have a strategic agreement that allows us to use the materials used in the most prestigious university in the world: HARVARD.

“ *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.

In a given situation, what would you do? This is the question that you are presented with in the case method, an action-oriented learning method. Throughout the course, you will be presented with multiple real cases. You will have to combine all your knowledge, and research, argue, and defend your ideas and decisions.

Re-Learning Methodology

Our University is the first in the world to combine Harvard University case studies with a 100%-online learning system based on repetition, which combines 16 different teaching elements in each lesson.

We enhance Harvard case studies with the best 100% online teaching method: Re-learning.

In 2019 we obtained the best learning results of all Spanish-language 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 Re-learning.

Our University is the only one in Spanish-speaking countries licensed to incorporate 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 Spanish online university indicators.



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

With this methodology we have 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, markets, and financial 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.

Re-learning 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

Based on the latest evidence in neuroscience, not only do we know how to organize information, ideas, images, memories, but we also know that the place and context where we have learned something is crucial for us to be able to remember it and store it in the hippocampus, and 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.



In this program you will have access to the best educational material, prepared with you 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.

This content is then adapted in an audiovisual format that will create our way of working online, with the latest techniques that allow us to offer you high quality in all of the material that we provide you with.



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 our future difficult decisions.



Practising Skills and Abilities

You 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 we live in.



Additional Reading

Recent articles, consensus documents, international guides. In our virtual library you will have access to everything you need to complete your training.





Case Studies

You 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 Latin America.



Interactive Summaries

We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This unique multimedia content presentation training system was awarded by Microsoft as a "European Success Story".



Testing & Re-testing

We periodically evaluate and re-evaluate your knowledge throughout the program. We do this on 3 of the 4 levels of Miller's Pyramid.



06

Certificate

Through a different and stimulating learning experience, you will be able to acquire the necessary skills to take a big step in your training. An opportunity to progress, with the support and monitoring of a modern and specialized university, which will propel you to another professional level.



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Include in your training a Postgraduate Certificate in Deep Foundations a highly qualification added value for any professional in this area"

The **Postgraduate Certificate in Deep Foundations** contains the most complete and up-to-date scientific program on the market.

After students have passed the evaluations, they will receive their corresponding **Postgraduate Certificate** issued by **TECH - Technological University** via tracked delivery.

The diploma 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 Deep Foundations**

ECTS: **6**

Official Number of Hours: **150**



future

health confidence people

education information tutors

guarantee accreditation teaching

institutions technology learning

community commitment

personalized service innovation

knowledge present quality

online training

development languages

classroom

tech technological
university

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Course Modality: Online

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Postgraduate Certificate Deep Foundations

