Postgraduate Certificate
Structural Concrete

tech global university

tech global university

Postgraduate Certificate

Structural Concrete

- 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/structural-concrete**

Index

01

Introduction

Structural concrete is one of the most widely used materials in construction, thanks to its mechanical properties and durability. Nowadays, there is a growing demand for safer and more sustainable infrastructures, which has driven the evolution and development of this material. For this reason, this program offers an up-to-date and specialized education for the engineer, providing knowledge and practical tools to address current construction needs in this area. In addition, it is developed in a 100% online format, which allows students to adapt their studies to their pace of life and schedules. It also uses the *Relearning* methodology to achieve a deep and lasting understanding of the concepts taught, which gives this program a greater effectiveness.

Expand your knowledge in fundamental aspects such as project fundamentals, structural analysis, limit state calculations and typical structural elements thanks to this exclusive program"

The construction of safer and more sustainable infrastructures is driving the evolution and development of this material. As such, Structural Concrete is one of the most widely used materials in construction, thanks to its strength and durability. For example, according to Mordor Intelligence's Structural Concrete market report, the global Structural Concrete market is expected to reach $180.8 billion in the coming years, driven by the growing demand for modern, high-strength infrastructure.

In this context, the Postgraduate Certificate in Structural Concrete has been developed. In it, the engineer will learn the basics of design, structural analysis, calculation of limit states and typical structural elements, as well as the constructive provisions and the execution of concreting. In addition, the program addresses the service life and maintenance of reinforced concrete, allowing engineers to learn the best practices to ensure the durability and safety of concrete structures.

This program is developed in a 100% online format, which allows students to balance their studies with their other duties and tasks. Likewise, TECH includes in all its programs the Relearning methodology, based on the idea that learning is not a linear process, but is built through repeated iterations and continuous learning. In this sense, the materials are presented in different audiovisual supports to facilitate the integration of knowledge.

This **Postgraduate Certificate in Structural Concrete** contains the most complete and up-to-date program on the market. The most important features include:

- The development of practical cases presented by experts in Civil Engineering
- The graphic, schematic, and practical contents with which they are created, provide 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

Discover the evolution of Structural Concrete in a program designed by the best experts in the field"

Immerse yourself in the durability of concrete, the maintenance of structures and constructive provisions in this university program"

Access a unique program 100% online so that you can balance your studies with your lifestyle and schedules.

You will have access to a library full of innovative, first-rate content that will allow you to delve into specific topics of interest to you.

The program's teaching staff includes professionals from the field who contribute their work experience to this educational 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 immersive education programmed to learn 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 students will be assisted by an innovative interactive video system created by renowned and experienced experts.

02

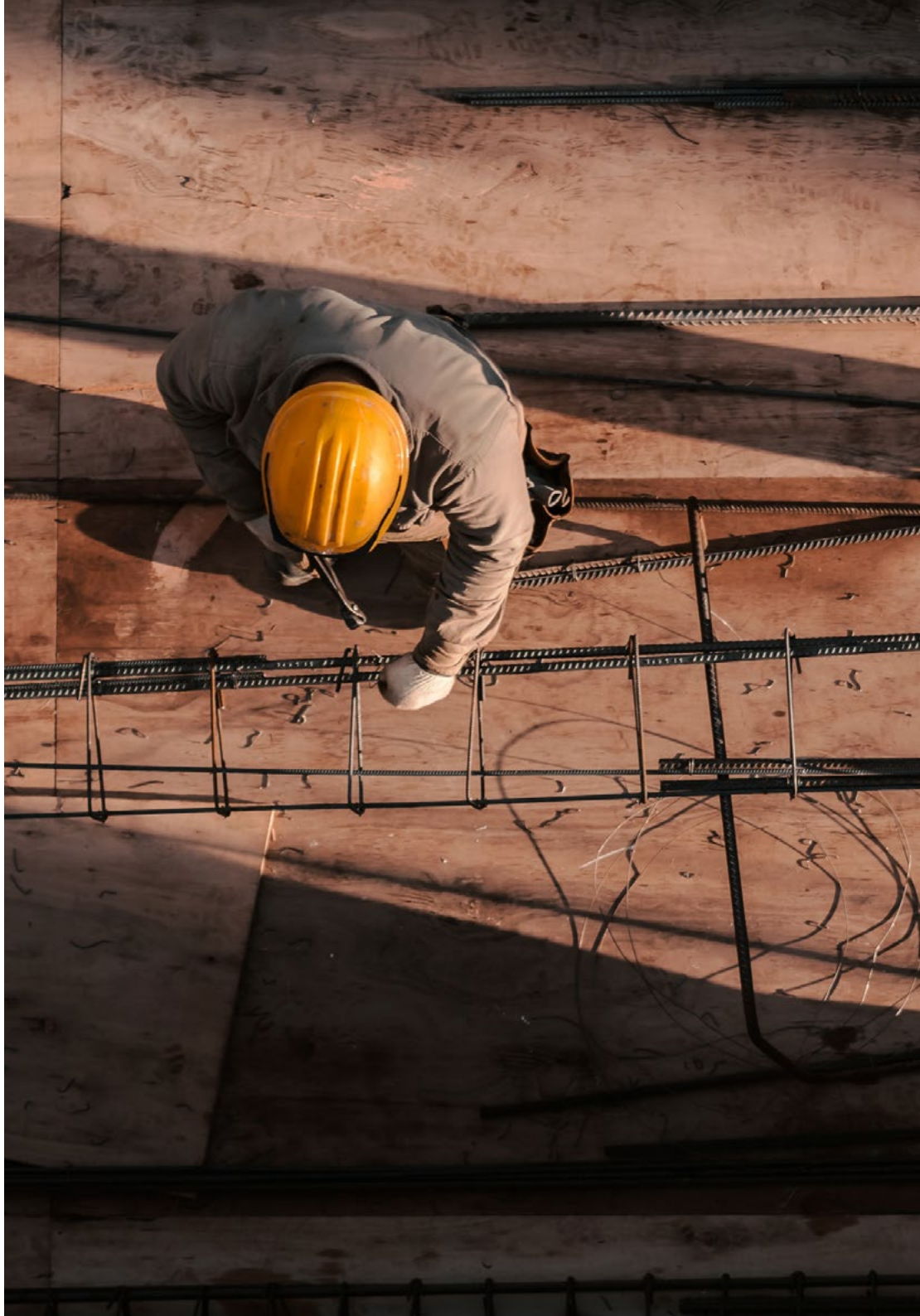
Objectives

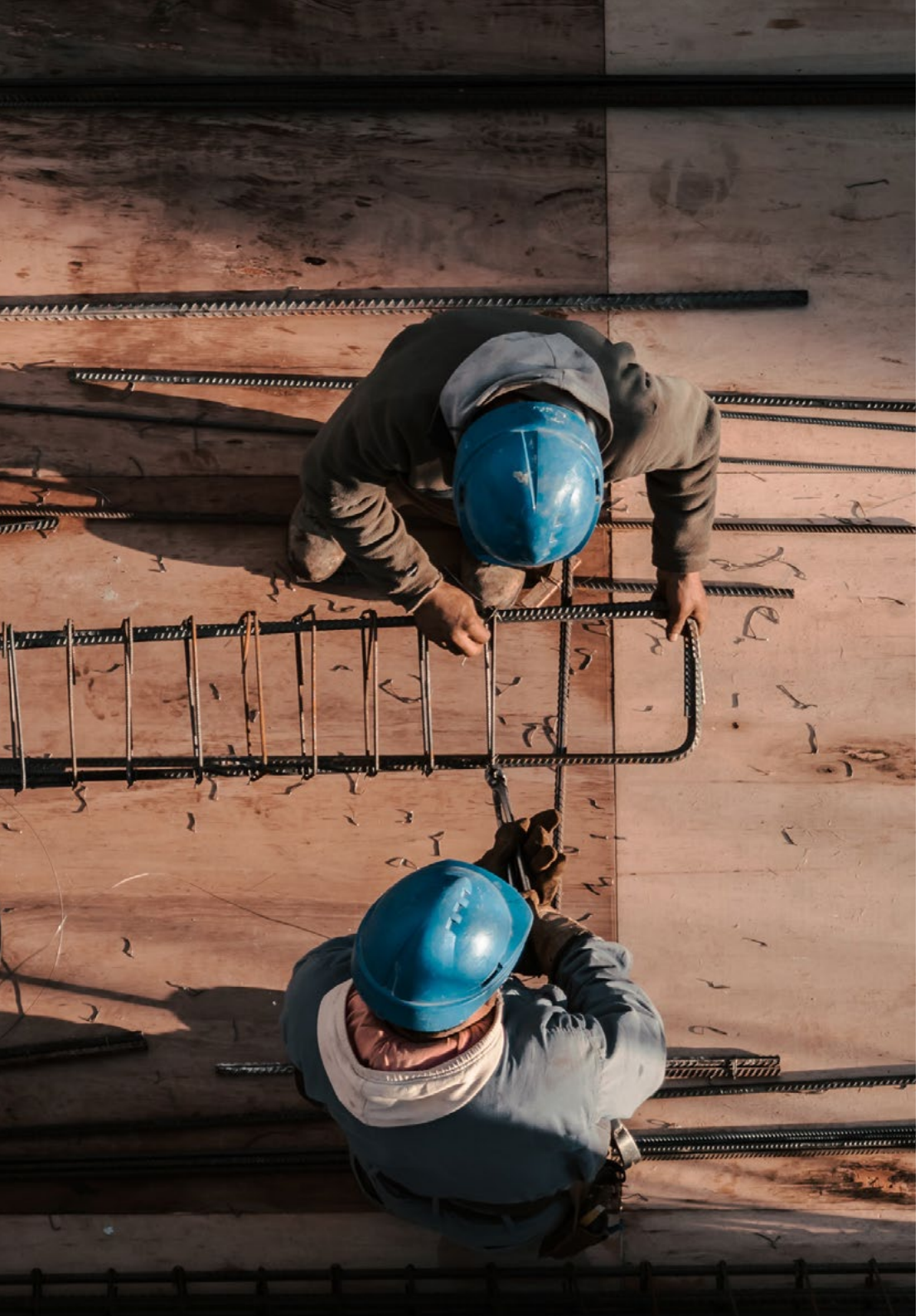
The evolution and development of Structural Concrete has driven the need to update and specialize the knowledge of engineers in this field. Therefore, the professional who enrolls in this program will study in depth the corrosion of steel, as well as the useful life and maintenance of reinforced concrete. All this through a fully online program that allows self-management of the teaching load. Likewise, thanks to the methodology used to teach it, Relearning, the graduate will obtain an optimal and lasting integration of knowledge in structural analysis models.

Gain a deep and lasting understanding of the concepts taught thanks to the Relearning methodology and stand out in your professional career"

General Objectives

- Learn in an autonomous way new knowledge and techniques suitable for Civil Engineering
- Know in detail the nature, characteristics and performance of new construction materials that have been investigated in recent years
- Understand and use the language of engineering, as well as the terminology of Civil Engineering
- Delve in a scientific and technical way in the exercise of the profession of Technical Engineer of Public Works with knowledge of the functions of consultancy, analysis, design, calculation, project, construction, maintenance, conservation and operation





Specific Objectives

- Analyze and understand how the characteristics of structures influence their behavior
- Apply knowledge of the resistant performance of structures in order to dimension them according to existing standards and using analytical and numerical calculation methods

Become a highly qualified professional in Structural Concrete thanks to the specialized and up-to-date syllabus that TECH has prepared for you"

03

Structure and Content

The demand for safer and more sustainable infrastructures drives the evolution and development of Structural Concrete. Therefore, this study program offers a specialized syllabus on aspects such as design bases, structural analysis, limit state design and typical structural elements, among other key topics. The program also includes a focus on concrete durability, structural maintenance and construction provisions. All of this is developed in a 100% online format, allowing students to adapt their studies to their pace of life.

Get ready to meet the challenges of building safer and more sustainable infrastructures with this program"

Module 1. Structural Concrete

1.1. Introduction
- 1.1.1. Introduction to the Subject
- 1.1.2. Historical Features of Concrete
- 1.1.3. Mechanical Behavior of Concrete
- 1.1.4. Joint Behavior of Steel and Concrete that has made Possible its Success as a Composite Material

1.2. Project Basis
- 1.2.1. Actions
- 1.2.2. Characteristics of Concrete and Steel Materials
- 1.2.3. Durability-Oriented Basis of Calculation

1.3. Structural Analysis
- 1.3.1. Structural Analysis Models
- 1.3.2. Data Required for Linear, Plastic or Non-Linear Modeling
- 1.3.3. Materials and Geometry
- 1.3.4. Prestressing Effects
- 1.3.5. Calculation of Cross-Sections in Service
- 1.3.6. Shrinkage and Creep

1.4. Service Life and Maintenance of Reinforced Concrete
- 1.4.1. Durability of Concrete
- 1.4.2. Deterioration of the Concrete Mass
- 1.4.3. Corrosion of Steel
- 1.4.4. Identification of the Factors of Aggressiveness on Concrete
- 1.4.5. Protective Measures
- 1.4.6. Maintenance of Concrete Structures

1.5. Calculations Related to Serviceability Limit States
- 1.5.1. Limit States
- 1.5.2. Concept and Method
- 1.5.3. Verification of Cracking Requirements
- 1.5.4. Verification of Deformation Requirements

1.6. Ultimate Limit State Calculations
- 1.6.1. Strength Behavior of Linear Concrete Elements
- 1.6.2. Bending and Axial Forces
- 1.6.3. Calculation of Second Order Effects with Axial Loading
- 1.6.4. Shear
- 1.6.5. Gradient
- 1.6.6. Torsion
- 1.6.7. D-Regions

1.7. Sizing Criteria
- 1.7.1. Typical Application Cases
- 1.7.2. The Node
- 1.7.3. The Bracket
- 1.7.4. The Large-Edged Beam
- 1.7.5. Concentrated Load
- 1.7.6. Dimensional Changes in Beams and Columns

1.8. Typical Structural Elements
- 1.8.1. The Beam
- 1.8.2. The Column
- 1.8.3. The Slab
- 1.8.4. Foundation Elements
- 1.8.5. Introduction to Prestressed Concrete

1.9. Constructive Arrangements
- 1.9.1. General Aspects and Nomenclature
- 1.9.2. Coatings
- 1.9.3. Hooks
- 1.9.4. Minimum Diameters

1.10. Concreting Execution
- 1.10.1. General Criteria
- 1.10.2. Processes Prior to Concreting
- 1.10.3. Elaboration, Reinforcement and Assembly of Reinforcements
- 1.10.4. Preparation and Placement of Concrete
- 1.10.5. Processes Subsequent to Concreting
- 1.10.6. Precast Elements
- 1.10.7. Environmental Aspects

Discover how the Relearning methodology allows you an optimal and lasting integration of knowledge in structural analysis models. Learn it for life!"

05

Methodology

This academic program offers students 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"

Case Study to contextualize all content

Our program offers a revolutionary approach to developing skills and knowledge. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.

At TECH, you will experience a learning methodology that is shaking the foundations of traditional universities around the world"

You will have access to a learning system based on repetition, with natural and progressive teaching throughout the entire syllabus.

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

A learning method that is different and innovative

This TECH program is an intensive educational program, created from scratch, which presents the most demanding challenges and decisions in this field, both nationally and internationally. This methodology promotes personal and professional growth, representing a significant step towards success. The case method, a technique that lays the foundation for this content, ensures that the most current economic, social and professional reality is taken into account.

> *Our program prepares you to face new challenges in uncertain environments and achieve success in your career"*

The case method is the most widely used learning system in 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

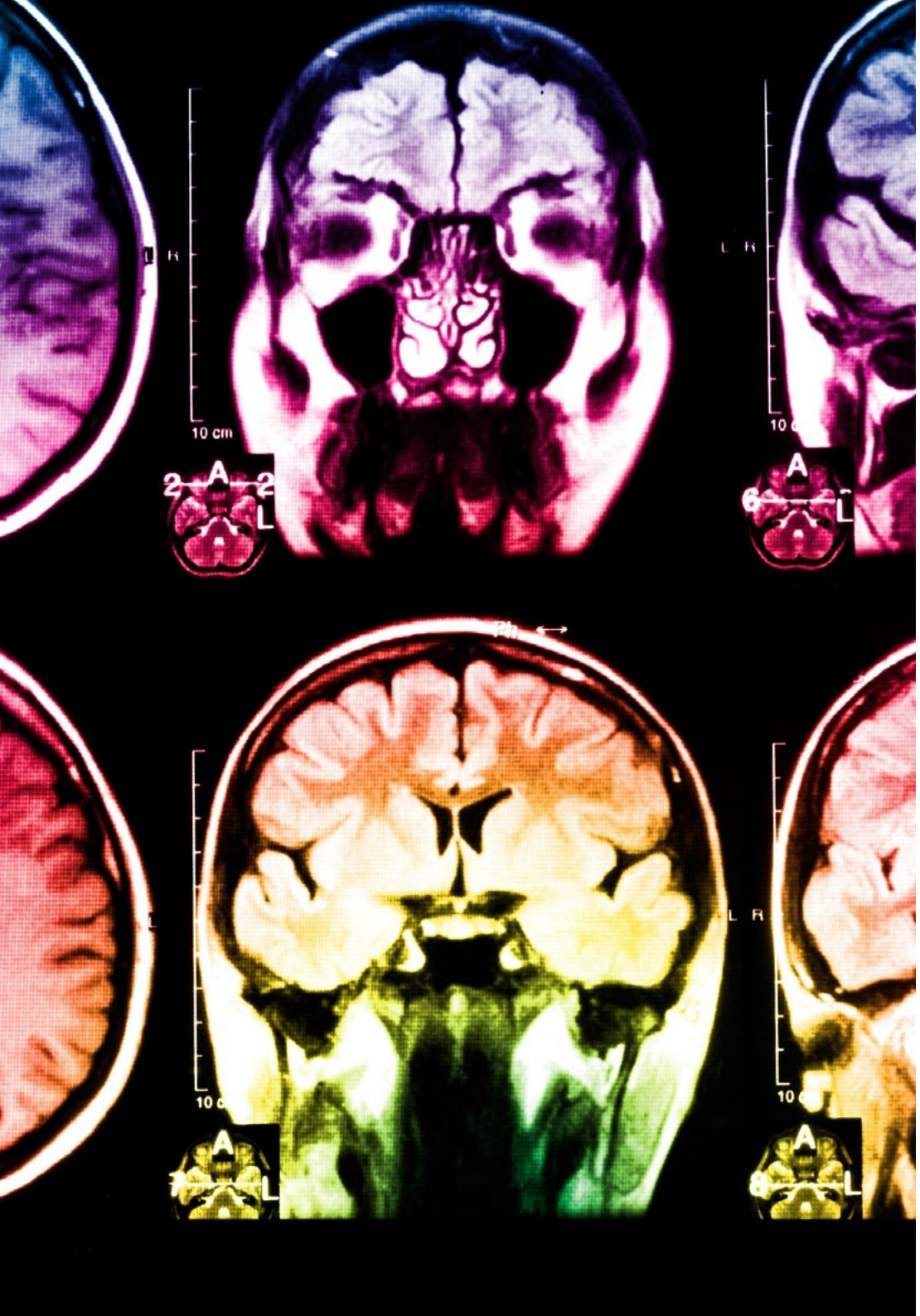
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

We enhance the Case Study 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 one 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.

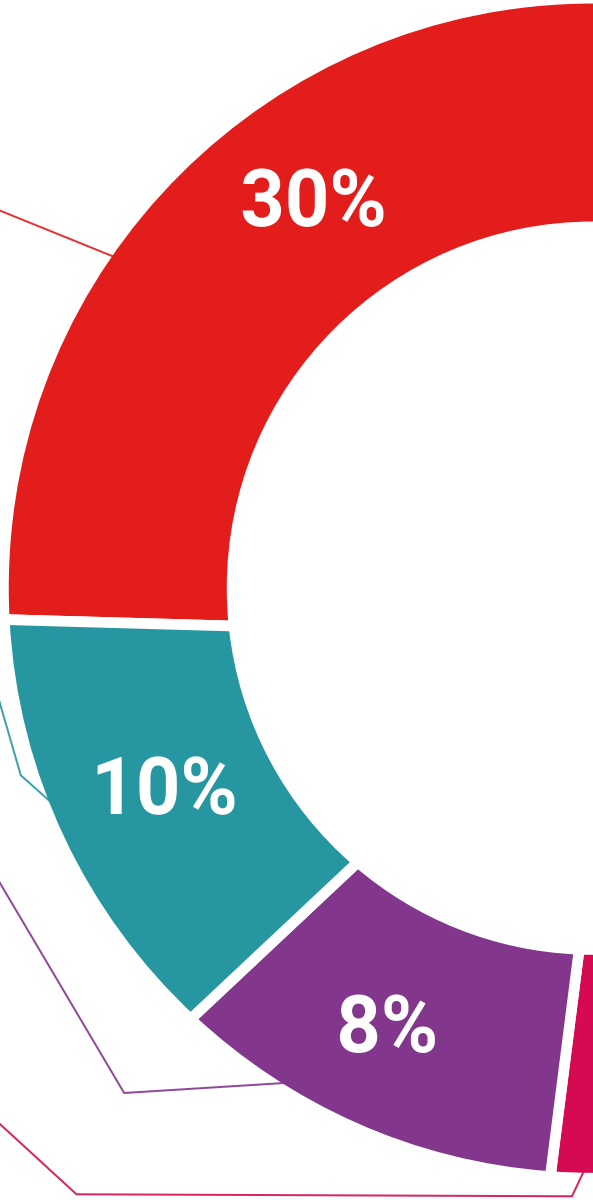
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

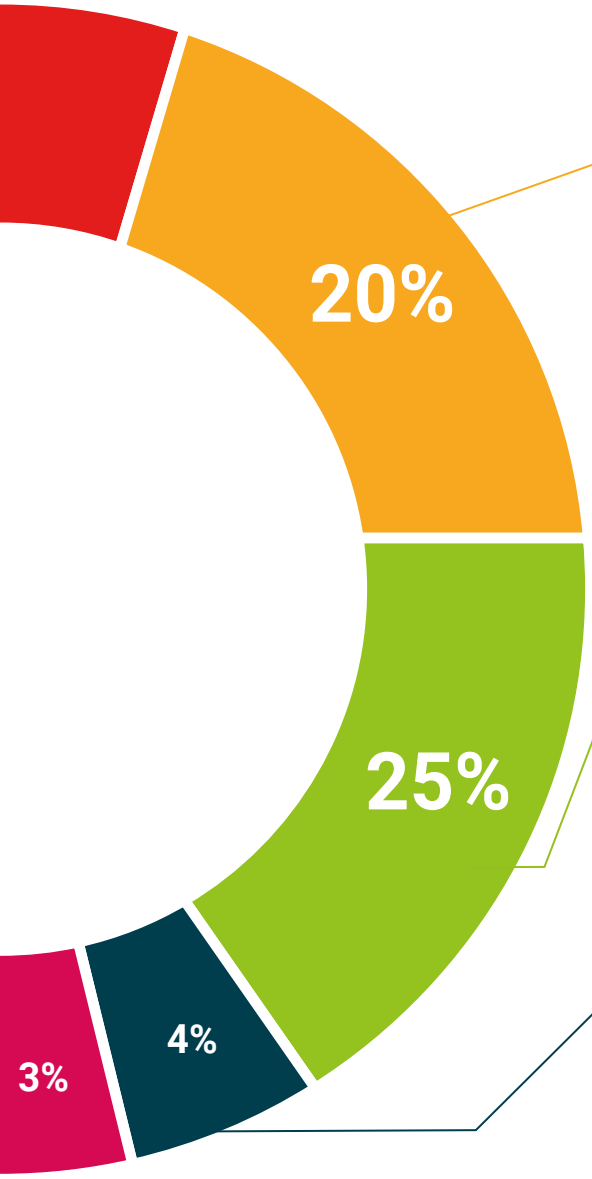
Practising Skills and Abilities

They will carry out activities to develop specific 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 that we are experiencing.

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

Students will complete a selection of the best case studies chosen specifically for this program. Cases that are presented, analyzed, and supervised by the best 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 educational system for presenting multimedia content 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 their goals.

05

Certificate

The Postgraduate Certificate in Structural Concrete guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.

Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork"

This program will allow you to obtain your **Postgraduate Certificate in Structural Concrete** 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 Structural Concrete**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**


tech global university

Mr./Ms. _____, with identification document _____
has successfully passed and obtained the title of:

Postgraduate Certificate in Structural Concrete

This is a program of 180 hours of duration equivalent to 6 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana
Rector

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country.

Unique TECH Code: AFWORD23S techtitute.com/certificates

*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.

tech global university

Postgraduate Certificate

Structural Concrete

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

Postgraduate Certificate
Structural Concrete

tech global university