

Postgraduate Certificate Science and Technology of Cement-Based Materials



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

Website: www.techtute.com/us/engineering/postgraduate-certificate/science-technology-cement-based-materials

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01

Introduction

Concrete is a resistant material and is widely used in construction works of different sectors. Over time, it has adapted to the new requirements of the manufacturers and more and more types can be found in the market. Thus, it is important to have professionals who know this material well and understand when it is manufactured to a good-quality standard. For this reason, this program provides students with all the tools they need to learn about the different technological aspects of this resistant material.



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Delve into the science of concrete and learn why it is one of the most requested materials for the construction of architectural works"

Concrete is one of the most widely used materials in construction throughout the world. However, with the passage of time, new types of concrete with special processing have appeared. Therefore, there is currently a great demand for professionals who possess this knowledge and apply it in their projects. Thus, the Postgraduate Certificate in Science and Technology of Cement-Based Materials will cover all the technological aspects of special concrete in its different aspects, as well as the definition of the characteristics, use, dosage and applications of each concrete.

This will provide an in-depth understanding of the tools needed to create materials that exactly meet the needs that construction companies are looking for and want to achieve. For this reason, we have an excellent teaching staff that offers students their extensive experience in the science and technology behind cement-based materials.

With a 100% online Postgraduate Certificate students will be able to study comfortably, wherever and whenever they want. All you need is a device with internet access to take your career one step further. A modality according to the current times with all the guarantees to position the engineer in a highly demanded sector.

This **Postgraduate Certificate in Science and Technology of Cement-Based Materials** contains the most complete and up-to-date educational program on the market. The most important features of the program include:

- ◆ Gain in-depth knowledge of the variables, analysis and processing methods, as well as the characterization and properties of the materials used in construction
- ◆ Determine the life cycle and the carbon footprint of the materials
- ◆ Experiment with new materials and technology related to new applications and uses
- ◆ Manage new building technologies and participate in building quality management processes
- ◆ Evaluate aspects of sustainability and environmental impact of the materials



Carry out an analysis of the different types of concrete that can be used in an architecture project and enhance your professional profile in this field"

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You will have access to the information no matter where you are, so you won't have to put your daily life on hold to specialize in this field of engineering”

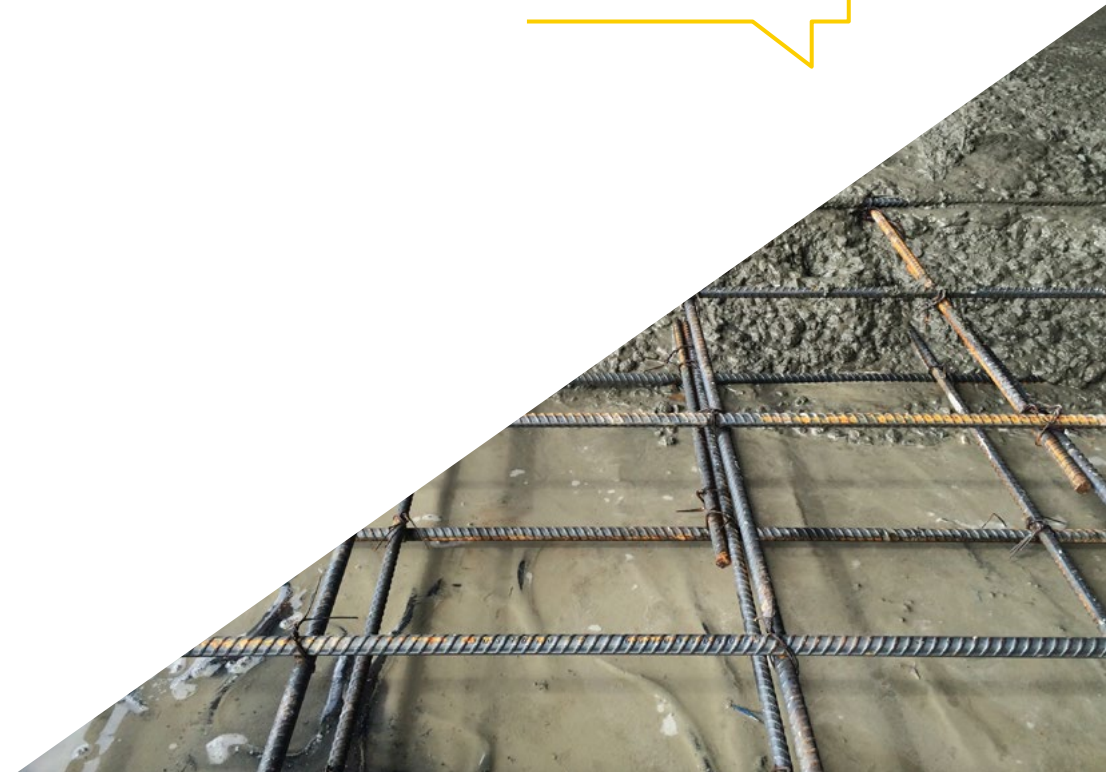
Complete this 100% online Postgraduate Certificate and become an expert in one of the most resistant materials in construction.

Experiment with the use of new materials and know the guidelines for its regulation in a construction work program.

The program's teaching staff includes professionals from the 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 immersive training 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 experts.



02 Objectives

The design of this Postgraduate Certificate will allow the student to acquire new competencies and skills that are necessary to update their knowledge and skills in their profession. The knowledge presented in this program will address the key aspects of the science behind the manufacture of concrete, such as the characteristics it possesses at each stage and the research conducted in recent years to develop newer components. In view of the above, TECH establishes the following general and specific objectives to guarantee the satisfaction of the future graduate.





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Analyze all the aspects that refer to the creation of new cement mixtures and stay one step ahead with innovation in your profession”



General Objectives

- ◆ Perform an exhaustive analysis of the different types of construction materials
- ◆ Gain in-depth knowledge of the features of different construction materials
- ◆ Implement new technologies applied to engineering materials
- ◆ Assess the waste materials
- ◆ Manage materials from a quality and production point of view
- ◆ Apply new techniques in making construction materials that are more environmentally friendly
- ◆ Raise awareness of new trends and materials applied to construction

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With a simple methodology and practical cases, you will be able to specialize in the science behind cement-based materials”





Specific Objectives

- ◆ Delve into the science of concrete: fresh and hardened state Characteristics in the fresh state, mechanical properties in the hardened state, stress-strain behavior, modulus of deformation and Poisson's ratio, creep, fracture. Dimensional stability, shrinkage
- ◆ Know in detail the nature, characteristics and performance of special concretes, which have been investigated in recent years
- ◆ Develop and manufacture special concretes according to their dosage specifications and technological properties
- ◆ Analyze the most important characteristics of special concretes, of the different existing typologies, whether with fibers, light, self-compacting, etc.
- ◆ Gain in-depth knowledge of the different techniques for producing blended mixtures
- ◆ Perform typical tests on construction materials, and be able to perform the required procedures

03

Course Management

In our commitment to offer elite education for all, TECH works with renowned professionals so that the student acquires solid knowledge in the speciality of Science and Technology of Cement-Based Materials. For this reason, this Postgraduate Certificate has a highly qualified team with extensive experience in the sector, who will offer students the best possible resources in the development of their skills during the course.





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A teaching team will guide you at every moment so that you can reach your maximum potential and position yourself as an expert in the world of concrete”

Management



Dr. Miñano Belmonte, Isabel de la Paz

- ◆ Contracted Doctor for the Advanced Construction Science and Technology Group of the Polytechnic University of Cartagena
- ◆ Technical Architect from the Polytechnic University of Cartagena
- ◆ Construction Engineer from the Camilo José Cela University
- ◆ PhD from the Polytechnic University of Cartagena
- ◆ Master's Degree in Construction (Major in Technology) from the Polytechnic University of Valencia
- ◆ Speaker at various national and international conferences and congresses
- ◆ Author of the books "*Manual de cálculo de hormigón armado. Teoría y ejemplos prácticos*" (Reinforced concrete calculation manual. Theory and practical examples) and "*Problemas resueltos de hormigón armado (HA)*" (Solved problems of reinforced concrete), as well as author of specific chapters in other books
- ◆ Co-author of various scientific high-impact publications on construction materials



Dr. Benito Saorin, Francisco Javier

- ◆ Technical Architect in Optional Direction and Coordination Functions Of SS
- ◆ Municipal Technician in the Ricote-Murcia Town Hall
- ◆ Work experience in an Architecture Office
- ◆ Construction Engineer
- ◆ Construction Engineer from the Camilo José Cela University
- ◆ PhD from the Polytechnic University of Valencia
- ◆ Master's Degree in Construction (Major in Technology) from the Polytechnic University of Valencia
- ◆ Vast experience in R&D&I with more than 10 years experience on site
- ◆ Reviewer of journals indexed in JCR
- ◆ Articles in international congresses and high-impact indexed journals on the different areas of construction materials



Dr. Rodríguez López, Carlos Luis

- ◆ Head of the Materials Department at the Construction Technology Center of the Region of Murcia
- ◆ Coordinator of the sustainable construction and climate change area in CTCON
- ◆ Technician in the projects department of PM Arquitectura y Gestión SL
- ◆ PhD in Construction Engineering in Construction Materials and Sustainable Construction
- ◆ Construction Engineer from Polytechnic University of Cartagena
- ◆ PhD from the University of Alicante
- ◆ Master's Degree in Engineering of Materials, Water and Land: Sustainable Construction from the University of Alicante
- ◆ Extensive experience in R&D&I
- ◆ Articles in international congresses and high-impact indexed journals on the different areas of construction materials
- ◆ Specialist in the development of new materials, products for construction and in the analysis of pathologies in construction

Professors

Mr. del Pozo Martín, Jorge

- ◆ Technical and economic evaluator and project auditor at the Spanish Ministry of Science and Innovation
- ◆ Civil Engineer
- ◆ Diploma in Business Administration from UNED In his professional work experience, he worked in the private sector in Arthur Andersen, Pacadar, Dragados and Bovis Lend Lease
- ◆ Master's Degree in Research in Civil Engineering from the University of Cantabria

Dr. Muñoz Sánchez, María Belén

- ◆ Consultant in Innovation and Sustainability of Construction Materials
- ◆ Reseracher in polymers at POLYMAT
- ◆ Dr. Engineer of Sustainable Processes and Materials from the University of the Basque Country
- ◆ Chemical Engineer from the University of Extremadura
- ◆ Master's Degree in Research, with a major in Chemistry from the University of Extremadura
- ◆ Extensive experience in R&D&I in materials, including waste valorization to create innovative construction materials
- ◆ Co-author of scientific article published in international journals
- ◆ Speaker at international congresses related to renewable energies and the environmental sector





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You will have access to a library of multimedia resources 7 days a week, 24 hours a day”

04

Structure and Content

The content has been designed to comply with the essential requirements in the field of Science and Technology of Cement-Based Materials. In addition, thanks to the proposals of the teaching team, it has the necessary structure to offer a broad perspective in this field. All this to delve into the science of concrete, from its condition to the characteristics and properties that compose it.



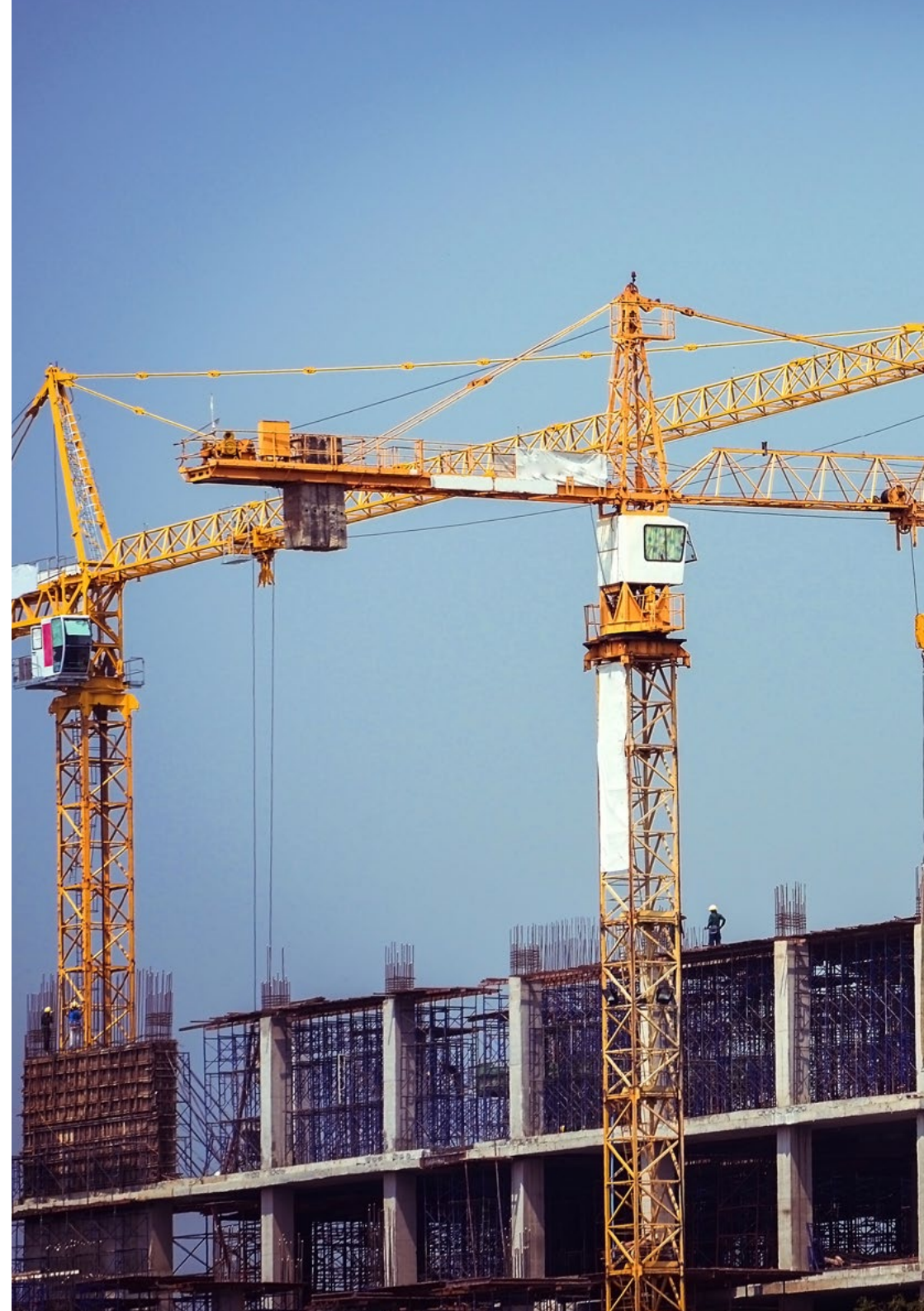


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This program has the necessary structure to provide you with all the knowledge you need to understand the science and technology of cement-based materials”

Module 1. Science and Technology of Cement-Based Materials

- 1.1. Cement
 - 1.1.1. Cement and Hydration Reactions: Cement Composition and Manufacturing Process. Majority Compounds, Minority Compounds
 - 1.1.2. Process of Hydration. Characteristics of Hydrated Products. Alternative Materials to Cement
 - 1.1.3. Innovation and New Products
- 1.2. Mortar
 - 1.2.1. Properties
 - 1.2.2. Manufacturing, Types and Uses
 - 1.2.3. New Materials
- 1.3. High Resistance Concrete
 - 1.3.1. Composition
 - 1.3.2. Properties and Characteristics
 - 1.3.3. New Designs
- 1.4. Self-Compacting Concrete
 - 1.4.1. Nature and Characteristics of its Components
 - 1.4.2. Dosage, Manufacturing, Transport and Commissioning
 - 1.4.3. Characteristics of the Concrete
- 1.5. Light Concrete
 - 1.5.1. Composition
 - 1.5.2. Properties and Characteristics
 - 1.5.3. New Designs
- 1.6. Fiber and Multifunctional Concretes
 - 1.6.1. Materials Used in the Manufacturing
 - 1.6.2. Properties
 - 1.6.3. Designs
- 1.7. Self-Repairing and Self-Cleaning Concretes
 - 1.7.1. Composition
 - 1.7.2. Properties and Characteristics
 - 1.7.3. New Designs





- 1.8. Other Cement-Based Materials (Fluid, Antibacterial, Biological, etc.)
 - 1.8.1. Composition
 - 1.8.2. Properties and Characteristics
 - 1.8.3. New Designs
- 1.9. Destructive and Non-Destructive Characteristics Trials
 - 1.9.1. Characterization of Materials
 - 1.9.2. Destructive Techniques. Fresh and Hardened State
 - 1.9.3. Non-Destructive Techniques and Procedures Applied to Materials and Construction Structures
- 1.10. Additive Mixtures
 - 1.10.1. Additive Mixtures
 - 1.10.2. Advantages and Disadvantages
 - 1.10.3. Sustainability

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Know the nature and characteristics of the components of concrete and implement them in civil construction work to improve its quality”

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.

“

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 Science and Technology of Cement-Based Materials 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 training
and receive your university degree
without travel or laborious paperwork”*

This program will allow you to obtain your **Postgraduate Certificate in Science and Technology of Cement-Based Materials** 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 Science and Technology of Cement-Based Materials**

ECTS: **6**

Official N° of Hours: **150 h.**





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