

# Postgraduate Certificate

## Channel and River Channeling Design





## Postgraduate Certificate

### Channel and River Channeling Design

- » Modality: online
- » Duration: 6 weeks
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/in/engineering/postgraduate-certificate/channel-river-channeling-design](http://www.techtute.com/in/engineering/postgraduate-certificate/channel-river-channeling-design)

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# 01

# Introduction

In order for human beings to survive and resist on a planet that is not theirs, they have also had to find ways to avoid waste and to know how to make use of natural resources. According to the climatic adversities, man has designed sanitation networks, water supply, drainage networks and different types of canals, among others. Currently, this type of work is carried out by civil engineers specialized in Hydraulic Engineering, since they have had to be aware of the fact that it is a field that is constantly being updated. Therefore, this program has been designed to provide the professionals with the most innovative theoretical and practical resources in the field of Hydraulic Infrastructures. A program that has great flexibility with the 100% online modality.







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*With this Postgraduate Certificate you will contribute to the preservation of the environment by providing innovative solutions to the integral water cycle”*

The construction of navigation routes or canals is part of man's workmanship, in order to connect one place to another by sea. Today, the canals that were built are used by renowned companies for the export and transportation of goods. In this way, engineers work on the most appropriate measures so that these activities continue to be carried out and do not harm the world economy, but also thinking about environmental conservation, making use of new materials and new techniques for the construction of these canals, avoiding affecting an entire population, including the water resource.

In this way, studies and updates in this field have given continuity in the advancement of providing solutions to a variety of natural failures, where engineers and experts in Hydraulic Infrastructures must remain at the forefront in this area of knowledge. Thus, this Postgraduate Certificate will provide the professional with new developments in the field of Channel Design and River Channeling.

The graduates will acquire solid knowledge in specific aspects on the analysis of works in canals and channeling with computer software, basing the results from the hydraulics of canals and the storage of drinking water, the construction of storage structures and their exploitation. It is a program that integrates a highly experienced and fully specialized team, supported with high quality audiovisual content that offers dynamism and comfort with the 100% online mode.

And so, TECH guides its teaching from the comfort and excellence with a program that offers the most complete update and the highest academic standards, being a qualification of great flexibility by only needing an electronic device with Internet connection.

This **Postgraduate Certificate in Channel and River Channeling Design** contains the most complete and up-to-date program on the market. The most important features include:

- ◆ The development of case studies presented by experts in Civil Engineering focused on Hydraulic Works
- ◆ 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



*With TECH you find the updates you need to keep growing in the field of Hydraulic Infrastructures”*

“

*The preservation of the environment is one of the most important challenges today. With the knowledge you will acquire in this Postgraduate Certificate, you will lead your career towards change”*

*You will be supported with the most exclusive multimedia content on canal and river channel design, guiding your career to the top.*

*This is a program that integrates the highest quality in education with the convenience of a 100% online modality.*

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

Its multimedia content, developed with the latest educational technology, will provide the professionals with situated and contextual learning, i.e., a simulated environment that will provide an immersive education programmed to learn in real situations.

The design of this program focuses on Problem-Based Learning, by means of which the professionals must try to solve the different professional practice situations that are presented throughout the academic course. For this purpose, the students will be assisted by an innovative interactive video system created by renowned experts.





# 02

# Objectives

This Postgraduate Certificate in Channel and River Channeling Design will help the professionals to achieve the necessary competencies to strengthen and deepen the key points of Hydraulic Works. For this reason, TECH provides students with different tools of academic innovation, successfully achieving the objectives of the program. At the end of this course, the students will have acquired knowledge to develop new knowledge on the storage of drinking water, the construction of storage structures and their exploitation, as well as to determine the particular elements that are part of a canalization.







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*Reach your goals with the best university: TECH will provide you with the tools you need to successfully develop this program”*



## General Objectives

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- ◆ Develop new knowledge in the hydraulics of free sheet pipelines
- ◆ Determine the particular elements that are part of a piping system
- ◆ Extrapolate this knowledge to real civil engineering problems, proposing
- ◆ Solutions and establishing construction procedures
- ◆ Analyze canal and canalization works with computer software, basing
- ◆ the results on canal hydraulics



*You will develop the most current knowledge in hydraulics, leading an optimal management in infrastructure”*







## Specific Objectives

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- ◆ Develop the general hydraulic concepts and fundamentals of free sheet pipelines
- ◆ Determine the elements that are part of hydraulic pipelines
- ◆ Examine the general aspects of pipeline routing
- ◆ Analyze in depth the concrete-lined channels, deepening in the considerations to take into account, as well as in the constructive procedures
- ◆ Establish the elements of flow regulation in canals in order to carry out an optimal management of the infrastructure
- ◆ Specify special elements that are part of the pipelines
- ◆ Apply the theoretical concepts to the simulation of pipelines in computer software

# 03

# Course Management

At TECH, high quality is everything, that is why it has a first class education accompanied by renowned professionals, where students will be able to expand their knowledge with solid aces in the specialty of Channel Design and River Channeling. Accordingly, this Postgraduate Certificate has a specialized and very experienced teaching team in Engineering of roads, canals and ports, cartography and topography of roads and BIM Management in Infrastructure and Civil Engineering.







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*You will have the support of the best and most qualified team specialized in the area of Roads, Canals and Ports Infrastructure”*

## Management



### D. González González, Blas

- ♦ Manager of the Technical Institute of Digital Construction Bimous
- ♦ Managing Director at Tolvas Verdes Malacitanas S.A
- ♦ CEO in Andaluza de Traviesas
- ♦ Director of Engineering and Development at GEA 21, S.A. Head of the Technical Services of the UTE Metro of Seville and co-director of the Construction Projects for Line 1 of the Metro of Seville
- ♦ CEO in Bética de Ingeniería S.A.L
- ♦ Teacher of several university master's degrees related to Civil Engineering, as well as subjects of the Degree in Architecture at the University of Seville
- ♦ Degree in Civil Engineering from the Polytechnic University of Madrid
- ♦ Master's Degree in New Materials Science and Nanotechnology from the University of Seville
- ♦ Master's Degree in BIM Management in Infrastructure and Civil Engineering by EADIC - Rey Juan Carlos University



## Professors

### Dr. Hernández Sánchez, Silvestre

- ◆ Manager of Infrastructure Management Actions of Andalusia
- ◆ Head of the Planning and Statistics Service of the General Directorate of Planning of the Regional Ministry of Public Works and Transport
- ◆ Head of the Office of the General Information System of the General Directorate of Planning of the Regional Ministry of Public Works and Transport
- ◆ Head of the Department of Technical Supervision in the Projects Service of the General Directorate of Roads of the Regional Ministry of Public Works and Transport
- ◆ PhD in the Department of Design Engineering at the School of Industrial Engineering of Seville
- ◆ Civil Engineer from the University of Granada
- ◆ Lecturer and speaker in several courses and congresses related to Cartography and Topography of Road Works



# 04

# Structure and Content

This program has been designed and conceived according to the requirements proposed by the faculty and the most recent research in the field of Hydraulic Works, establishing a study plan that provides a great deal of content on the Design of Canals and River Channeling.

This Postgraduate Certificate is oriented to incorporate advanced content on the design of civil works in Civil 3D and the distribution of velocities and pressures in channels. All this, by means of the multiple didactic tools that offer a greater dynamics for the development of this university qualification.





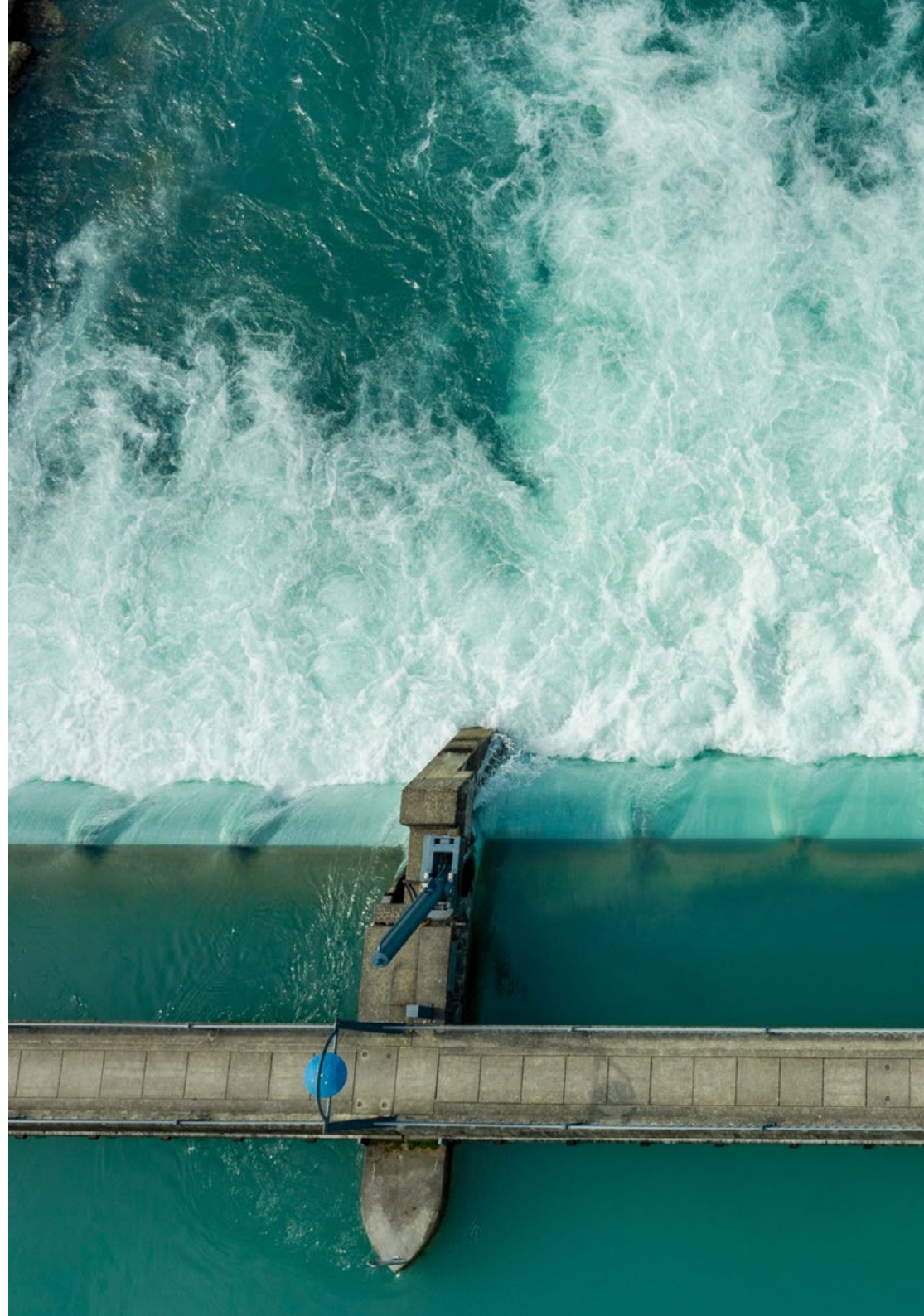


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*Expertly crafted syllabus and quality content are the key to your learning success”*

**Module 1. Channels and river channelization. Elements and design**

- 1.1. Properties of flow in open channels. Hydraulic fundamentals
  - 1.1.1. Classification of flows in channels
  - 1.1.2. Types of open channels
  - 1.1.3. Geometry of an artificial channel
  - 1.1.4. Elements of a channel section
  - 1.1.5. Velocity and pressure distribution in channels
  - 1.1.6. Flow energy in open channels
  - 1.1.7. Critical flow status
  - 1.1.8. Local phenomena. Hydraulic Highlighting
- 1.2. Formulation of channel flows
  - 1.2.1. Uniform motion in channels
  - 1.2.2. Gradually varying flow in channels
  - 1.2.3. Characteristics of gradually varied motion in channels
  - 1.2.4. General formula for draft variation
  - 1.2.5. Cases of gradually varied motion
- 1.3. Geometric definition of the standard section
  - 1.3.1. Initial Aspects
  - 1.3.2. Design Criteria
  - 1.3.3. Channel lining
  - 1.3.4. Guards in canals
  - 1.3.5. Types of drainage
- 1.4. Concrete-lined channels
  - 1.4.1. Concrete-lined channels
  - 1.4.2. Construction Aspects
  - 1.4.3. Types of joints in Concrete Channels
  - 1.4.4. Construction phases of a canal
- 1.5. Canal layout
  - 1.5.1. The layout of a canal
  - 1.5.2. Aqueducts
  - 1.5.3. Tunnels
  - 1.5.4. Siphons
  - 1.5.5. Channeling of rivers







- 1.6. Special elements in canals
  - 1.6.1. Transitions between different sections
  - 1.6.2. Desanders
  - 1.6.3. Gauging
- 1.7. Regulation in canals
  - 1.7.1. Manual gates
  - 1.7.2. Hydraulically operated by-pass dampers
  - 1.7.3. Hydraulically operated automatic control dampers
  - 1.7.4. Duckbill weirs
- 1.8. Spillways
  - 1.8.1. Design
  - 1.8.2. Fixed lip spillways
  - 1.8.3. Siphon spillways
- 1.9. HEC-RAS for simulation in free sheeting
  - 1.9.1. HEC-RAS. Features
  - 1.9.2. Limitations in channel modeling
  - 1.9.3. Data required for modeling
  - 1.9.4. Results Obtained
- 1.10. Modeling Strategy
  - 1.10.1. Civil 3D design of the civil works in plan
  - 1.10.2. Longitudinal Profiles in Civil 3D
  - 1.10.3. Cross Sections in Civil 3D

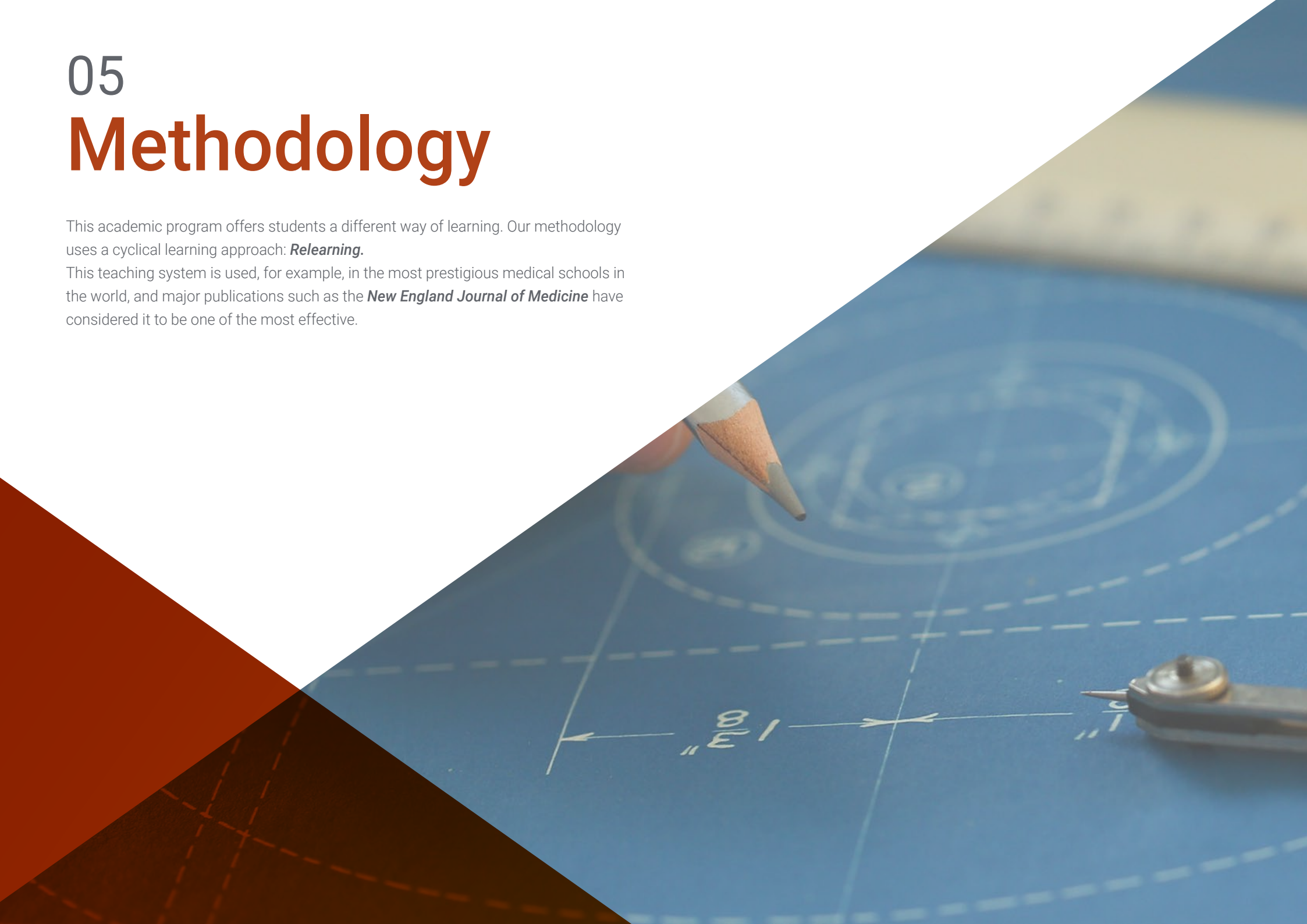
“*TECH offers you the most innovative and exclusive content on Channel Design and River Channeling with this Postgraduate Certificate*”

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.



06

# Certificate

The Postgraduate Certificate in Channel and River Channeling Design guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological University.



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



This **Postgraduate Certificate in Channel and River Channeling Design** contains the most complete and up-to-date program on the market.

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

The certificate 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 Channel and River Channeling Design**

Official N° of hours: **150 h.**



\*Apostille Convention. In the event that the student wishes to have their paper certificate issued with an apostille, TECH EDUCATION 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  
development languages  
virtual classroom



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