

# Postgraduate Certificate Water Supply Network Design



## Postgraduate Certificate Water Supply Network Design

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

Website: [www.techtitute.com/pk/engineering/postgraduate-certificate/water-supply-network-design](http://www.techtitute.com/pk/engineering/postgraduate-certificate/water-supply-network-design)

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# 01

# Introduction

One of the United Nations Sustainable Development Goals is access to clean water and sanitation. Unfortunately, the portrait of the lives of many people in the world is summarized in the struggle to get it and be able to survive. In this sense, engineers have studied different areas to provide solutions to this global problem, causing an impact and great importance in this field of study. That is why this academic program has been designed to provide important content of the sector, related to the identification of the main elements of a water collection, storage and purification system. This will be supported by audiovisual material that will give dynamism to the program and with the convenience of the 100% online format.





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*This Postgraduate Certificate will contribute to your professional growth and positioning in a sector that is currently booming”*

Drinking water supply involves collecting the liquid and transporting it to the point where it is consumed in optimum conditions. In order for water to be fit for consumption, it must not only meet sanitary requirements, but also quality requirements. Accordingly, professionals in Hydraulic Engineering have set themselves the task of creating methods to ensure that drinking water reaches rural areas and areas farther away from urban areas that do not have a proper distribution system. This can be achieved by determining the general design aspects of a supply system.

Therefore, research, tests and studies have advanced, solving some obstacles and leaving some others in question. For this reason, the professionals in this field of study must be up to date with updates on the sector to be addressed. Thus, this Postgraduate Certificate will provide the graduates with knowledge and innovative tools on the design of water supply networks and the deepening of the different alternatives for the selection of collection and/or purification systems.

The students will strengthen his skills in different areas related to the approach of solutions for the implementation, maintenance and operation of water supply systems. On the other hand, this program integrates a specialized and highly experienced teaching team, in addition to having the support of high quality multimedia content and a load of 150 hours that you can distribute in any way to present your sessions at any time.

In this way, TECH coordinates efficiency and excellence in the best way, so this program offers the most complete and first level update, positioning its students with the best academic standards at the end of the course. The students will only need an electronic device with good Internet coverage and thus, will easily access the virtual platform from the comfort of the place where they are.

This **Postgraduate Certificate in Water Supply Network 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



*Stand out in sector with enormous potential and become a part of of efficiency and the global change based on excellence"*



*This program will provide the graduates with a solid foundation and innovative tools in Water Supply Network Design"*

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.

*The maintenance and operation of upstream supply systems is one of the competencies that you will undoubtedly master by the end of this Postgraduate Certificate.*

*At TECH you will be able to expand your skills in BIM methodology in the design and analysis of upstream distribution systems.*



# 02

# Objectives

This Postgraduate Certificate in Water Supply Network Design, will allow the students to acquire the essential skills and thus, to couple the necessary updates to the profession and the challenges that the same has in the area of Hydraulic Works. Likewise, the students will have at their disposal different first level resources, thus guaranteeing the success of the program. At the end of the program, the graduates will have nurtured their knowledge in the different types of high supply systems, where gravity conveyance systems and pressure conveyance systems stand out.

A large, light blue water pipe is shown in a close-up, low-angle shot. The pipe is supported by concrete pillars. On the side of the pipe, the word "DRINK" is written in large, bold, black capital letters. To the left of the word, a black arrow points towards the left. The background is a bright, overcast sky. The overall composition is clean and modern, with a strong geometric feel due to the diagonal lines of the pipe and the background elements.

← DRINK



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*With this program you will develop a specialized knowledge in Water Supply Network Design concepts"*



## General Objectives

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- ◆ Develop new knowledge on large water supply pipelines
- ◆ Identify the main elements that compose the high head supply systems, and the main materials
- ◆ Deepen the concept of water hammer, and the protection elements necessary in upstream supply systems
- ◆ Develop the main design criteria of the elements that make up the system, as well as their application in the simulation with computer software
- ◆ Analyze the use and application of BIM methodology in the design, modeling and operation of large pipelines







## Specific Objectives

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- ◆ Specify the basic hydraulic fundamentals of large water conveyance pipelines
- ◆ Develop the fundamentals of water hammer phenomena
- ◆ Determine the general design aspects of an upstream water supply system
- ◆ Identify the main sizing criteria
- ◆ Analyze solutions for system protection elements using specialized water hammer software
- ◆ Propose solutions for the commissioning, maintenance and operation of upstream water supply systems
- ◆ Apply BIM methodology in the design and analysis of upstream distribution systems



*You will achieve your objectives thanks to the solid knowledge and dynamic tools provided by TECH"*

03

# Course Management

TECH is at the forefront of education, offering the highest level of teaching for students who take its programs with the support of didactic tools them to carry out that successfully achieve the development of each of its programs. In this way, the graduates will have access to a series of material created by a faculty specialized in Civil Engineering, Technology and Management of the Integrated Water Cycle and Science of New Materials and Nanotechnology. Their robust experience and extensive background in the industry will , allow them to resolve doubts or answer questions that arise during the course of the program.







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*If you want to succeed, do it with the best and acquire the necessary skills to excel in the Water Works sector”*

## Management



### Mr. 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

### Mr. Rubio González, Carlos

- ♦ Head of the Development Department at TEAMBIMCIVIL S.L
- ♦ Specialist at the Interuniversity Institute for Research on the Earth System in Andalusia at the University of Granada
- ♦ Civil Engineer at TEAMBIMCIVIL S.L
- ♦ Double Master in Civil Engineering and Environmental Hydraulics by the University of Granada
- ♦ Master's Degree in Technology and Management of the Integral Water Cycle from the University of Seville
- ♦ Degree in Civil Engineering from the University of Seville with mention in Hydrology
- ♦ Lecturer in specialization courses on BIM Modeling of Water Supply and Irrigation Networks







# 04

# Structure and Content

This academic qualification provides a study plan that provides exclusive content on Water Supply Network Design, according to the most recent research in the field of Hydraulic Infrastructure. This Postgraduate Certificate is focused on providing the students with state-of-the-art material on excavation distortion and pressure galleries, based on tunnel pipelines. All this by means of multiple multimedia tools that offer dynamism and a greater attractiveness to this university program.







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*A study plan carried out by a professional team specialized in hydraulic network systems with which you will reach the most ambitious objectives in the work field”*



## Module 1. Upstream supply systems. Water transport pipelines

- 1.1. Types of Upstream supply systems
  - 1.1.1. Gravity conveyance systems
  - 1.1.2. Pressure transport systems
  - 1.1.3. Components
- 1.2. Design of upstream supply systems
  - 1.2.1. Plan Layout
  - 1.2.2. The pipeline profile
  - 1.2.3. Buried pipelines
  - 1.2.4. Headworks, midstream and tailrace reservoirs
  - 1.2.5. Components
- 1.3. System Dimensioning
  - 1.3.1. Magnitude and time distribution of demand
  - 1.3.2. Design Flow Rate
  - 1.3.3. Design Criteria
  - 1.3.4. Mechanical calculation of pipelines
- 1.4. Head losses in pipelines
  - 1.4.1. Linear losses
  - 1.4.2. Localized losses
  - 1.4.3. Economic diameter
- 1.5. Tunnel pipelines
  - 1.5.1. State of rock mass loadings
  - 1.5.2. Excavation distortion
  - 1.5.3. Bearing
  - 1.5.4. Free sheet tunnels
  - 1.5.5. Pressurized galleries
- 1.6. Singular elements
  - 1.6.1. Lift stations
  - 1.6.2. Hydraulic study of the elevator
  - 1.6.3. Siphons operation
  - 1.6.4. Siphon calculation and design







- 1.7. Structural protection of the pipeline
  - 1.7.1. Water Hammer
  - 1.7.2. Calculation of water hammer in pipelines
  - 1.7.3. Elements of protection against the water hammer
- 1.8. Other protections
  - 1.8.1. Cathodic protections
  - 1.8.2. Coatings
  - 1.8.3. Types of Coatings for pipelines
  - 1.8.4. Valves and suction cups
- 1.9. Materials in high pressure supply systems
  - 1.9.1. Regulations and selection criteria
  - 1.9.2. Ductile iron pipes
  - 1.9.3. Helical welded steel pipes
  - 1.9.4. Reinforced and prestressed concrete pipelines
  - 1.9.5. Pipes made of plastic materials
  - 1.9.6. Other Materials
  - 1.9.7. Quality control of materials
- 1.10. Connecting, operating and control elements
  - 1.10.1. Types of joints and elements
  - 1.10.2. Valves
  - 1.10.3. Aeration valves or suction cups
  - 1.10.4. Complementary elements



*A Postgraduate Certificate designed  
and formulated for the best. Enroll now!"*

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.







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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"*

## 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.

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*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 Water Supply Network 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 Water Supply Network 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** 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 Water Supply Network 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.





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