

# Postgraduate Certificate Metrology, Measuring Equipment and Instrumentation in Urban Water Services



## Postgraduate Certificate Metrology, Measuring Equipment and Instrumentation In Urban Water Services

- » 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/metrology-measuring-equipment-instrumentation-urban-water-services](http://www.techtute.com/us/engineering/postgraduate-certificate/metrology-measuring-equipment-instrumentation-urban-water-services)

# Index

01

Introduction

---

*p. 4*

02

Objectives

---

*p. 8*

03

Course Management

---

*p. 12*

04

Structure and Content

---

*p. 16*

05

Methodology

---

*p. 20*

06

Certificate

---

*p. 28*

# 01

# Introduction

Under the premise that what cannot be measured cannot be improved, this complete TECH program will expose the fundamental aspects related to the control of the parameters of an Urban Water Service operation. In this way, the student will be fully qualified to be able to analyze, implement and supervise a complete telemetering system of all the parameters involved in an integral urban water system. The knowledge, competencies and skills that the engineers will acquire with the completion of this program will help them to improve their professional practice and to position themselves as experts in this area.







“

*Learn how to use the measuring instruments that help the urban water service and become a high-level engineer by studying this TECH Postgraduate Certificate”*

Although the sanitation network is sometimes the most neglected phase of the integral water cycle, the large number of corrective interventions that this system has been requiring with the increased demands of users, has led to an intense technification of the elements of these networks.

In the different stages of the integral urban water cycle, professionals in the sector are required to focus their daily operations on improving production processes. Under the premise that what cannot be measured cannot be improved, the fundamental aspects related to the control of the parameters are presented in this course.

The main sensors that will be developed during the Postgraduate Certificate:

- ◆ Flowmeters for the optimization of the hydraulic performance of the process stages, highlighting the strengths of each type of meter
- ◆ Pressure meters, to operate the system pumping under the stipulated conditions
- ◆ Temperature controllers, to understand treatment processes where temperature acts as a catalyst for the process
- ◆ Tank and basin levels to operate the system without the need to record these values by operators
- ◆ Water quality monitoring equipment

All of the above can be implemented under a local plant control system and can also be centralized to be operated from outside the plant. In-plant processes can be programmed to operate autonomously from each other. All these possibilities will be exposed in the Postgraduate Certificate.

By completing the Postgraduate Certificate, the student will be able to analyze, implement and supervise a complete telemetering system of all the parameters involved in an integral urban water system.

A 100% online Postgraduate Certificate that provides the student with the ease of being able to study it 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 Metrology, Measurement Equipment and Instrumentation in Urban Water Services** contains the most complete and up-to-date educational program on the market. The most important features include:

- ◆ The development of case studies presented by experts in Engineering focused on the Integrated Water Cycle
- ◆ The 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, discussion forums on controversial topics and individual reflection papers
- ◆ Content that is accessible from any fixed or portable device with an Internet connection



*TECH makes a major effort to generate academic programs of excellence. This is the only way to graduate the best professionals in the sector"*

“

*In a complex world of work, specialization is the only tool at the engineer's service when it comes to making your professional profile stand out"*

The program's teaching staff includes professionals from the sector who contribute their work experience to this 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 throughout the program. For this purpose, the professional will be assisted by an innovative interactive video system created by renowned and experienced engineering experts.

*Enhance your knowledge and become an expert engineer in measuring instruments in urban water utilities.*

*As it is an online program, you will be able to study wherever and whenever you want.*



02

# Objectives

This program has been designed with the objective of preparing engineers to work with water resources having full knowledge of the elements of measurement as well as meteorological issues. This knowledge will allow professionals to develop their full faculties in a field that is versatile, global and essential, guiding them towards excellence in a sector in continuous environmental adaptation. For this reason, TECH establishes a series of general and specific objectives that will help students understand what they will achieve with this academic program.







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*If your goal is to position yourself as a prestigious engineer, then this is the program for you"*



## General Objectives

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- ◆ Delve into key aspects of Urban Water Services Engineering
- ◆ Leadership of integrated water cycle departments
- ◆ Management of distribution and sanitation departments
- ◆ Management of drinking water treatment, desalination and purification plants
- ◆ Management of the technical office and studies of companies in the sector
- ◆ Mastering a strategic vision of the subject
- ◆ Strong knowledge of coordinating concessions and administrative relations

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*Your goal and TECH's goals  
become one with this program:  
academic excellence”*







## Specific Objectives

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- ◆ Understand the need for the implementation of different process sensors in an urban water system
- ◆ Select the most appropriate flow measurement technologies for each application
- ◆ Make a general projection of the appropriate metering devices for a general urban water service



# 03

# Course Management

In order to offer high-quality education, this academic program has a group of first class professionals who bring to this education the experience of their years of work in an ever-changing industry. Being able to learn from the best will ensure the professional to develop their skills optimally. In this way, students have the guarantees they need to specialize at an international level in a booming sector that will catapult them to professional success.







“

*Succeed with the best and acquire the knowledge and skills you need to embark on the urban water sector”*

## Management



### Mr. Ortiz Gómez, Manuel

- ◆ Deputy to the head of the Water Treatment Department at FACSA
- ◆ Head of Maintenance at TAGUS, concessionaire of water and sewage services in Toledo
- ◆ Industrial Engineer at Jaume I. University
- ◆ Postgraduate Degree in Innovation in Business Management from the Valencian Institute of Technology
- ◆ Executive MBA from EDEM
- ◆ Author of several papers and presentations at conferences of the Spanish Association of Desalination and Reuse and the Spanish Association of Water Supply and Sanitation



## Professors

### Mr. Salaix, Rochera, Carlos

- ♦ Professional in sectors related to urbanization, construction of wastewater treatment plants and water treatment and maintenance of supply and sanitation infrastructure networks
- ♦ Technical Engineer in Public Works, specializing in Transport and Urban Services, Polytechnic University of Valencia
- ♦ Master's Degree in Integrated Management PRL, Quality, Environment, Continuous Improvement (EFQM), Universitat Jaume I de Castellón
- ♦ Official Master's Degree in Occupational Risk Prevention (Hygiene, Safety, Ergonomics), Universitat Jaume I of Castellón



# 04

# Structure and Content

The structure and contents of this academic program have been designed based on maximum rigor and the latest developments in the sector. Likewise, a group of top-level professionals has been in charge of creating the syllabus, bringing to this program the experience of their years of work. In this way, the student will have access to a compendium of first level contents that will serve as a complete theoretical support when facing his daily practice.





“

*To learn in the best way, you need quality content.  
That's why TECH makes a capital investment in the  
design of a high-level academic program"*

## Module 1. Metrology, Measurement and Instrumentation

- 1.1. Parameters to be Measured
  - 1.1.1. Metrology
  - 1.1.2. Water Pollution Problems
  - 1.1.3. Choice of Parameters
- 1.2. Importance of Process Control
  - 1.2.1. Technical Aspects
  - 1.2.2. Health and Safety Aspects
  - 1.2.3. Supervision and External Control
- 1.3. Pressure Gauges
  - 1.3.1. Pressure Gauges
  - 1.3.2. Transducers
  - 1.3.3. Pressure Switches
- 1.4. Level Gauges
  - 1.4.1. Direct Measurement
  - 1.4.2. Ultrasonic
  - 1.4.3. Linimeters
- 1.5. Flow Meters
  - 1.5.1. In Open Channels
  - 1.5.2. In Closed Pipelines
  - 1.5.3. In Wastewater
- 1.6. Temperature Gauges
  - 1.6.1. Temperature Effects
  - 1.6.2. Temperature Measurement
  - 1.6.3. Mitigating Actions





- 1.7. Volumetric Flow Meters
  - 1.7.1. Choice of a Meter
  - 1.7.2. Main Types of Meters
  - 1.7.3. Legal Aspects
- 1.8. Water Quality Measurement. Analytical Equipment
  - 1.8.1. Turbidity and PH
  - 1.8.2. Redox
  - 1.8.3. Integrated Samples
- 1.9. Location of Measuring Equipment in a Plant
  - 1.9.1. Inlet and Pre-treatment Works
  - 1.9.2. Primary and Secondary
  - 1.9.3. Tertiary
- 1.10. Aspects to Consider Regarding Telemetry and Remote-Control Instrumentation
  - 1.10.1. Control Loops
  - 1.10.2. PLCs and Communication Gateways
  - 1.10.3. Remote Management



*Welcome to the academic program that will take your skills to the next level"*



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 Metrology, Measurement Equipment and Instrumentation in Urban Water Services 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 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 Metrology, Measuring Equipment and Instrumentation in Urban Water Services** 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 Metrology, Measuring Equipment and Instrumentation in Urban Water Services**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**



future  
health confidence people  
education information tutors  
guarantee accreditation teaching  
institutions technology learning  
community commitment  
personalized service innovation  
knowledge present  
development language  
classroom



## Postgraduate Certificate Metrology, Measuring Equipment and Instrumentation In Urban Water Services

- » Modality: online
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