

# Postgraduate Certificate Sustainable Urban Drainage System Design





## Postgraduate Certificate Sustainable Urban Drainage System 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/sustainable-urban-drainage-system-design](http://www.techtitute.com/pk/engineering/postgraduate-certificate/sustainable-urban-drainage-system-design)

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# 01

# Introduction

The responsible use of natural resources has been the focus of attention of different governmental organizations worldwide in recent times. The appropriate management of biological resources through the implementation of Sustainable Urban Drainage Systems (SUDS) is a fundamental component in the design of environmentally friendly buildings. That is why, given the relevance of this advance, this program has been created, which will provide the professionals with exclusive material on the analysis of SUDS for detention, retention, filtration, infiltration and treatment. Accompanied by multimedia resources of high standards that will help the students in the dynamism of the academic process.





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*TECH will provide you with first-hand material on the Urban Sustainable Drainage Systems sector, as well as multimedia support of the highest level”*

The implementation of drainage networks makes it possible to mitigate the problems associated with inadequate stormwater management. Thus, Sustainable Urban Drainage Systems (SUDS) become the best alternative to improve the performance of sanitation systems. Accordingly, hydraulic engineers have been identifying the main design parameters for each typology. This goes beyond the simple task of transporting and collecting rainwater, but also decontaminates and filters it in a responsible manner.

Thus, studies in this area of knowledge have continued to advance in order to provide answers to multiple questions, making it clear that professionals in Hydraulic Works must remain at the forefront in this field of study. That is why this Postgraduate Certificate will provide the professionals with updates on the Sustainable Urban Drainage System Design and a focus on developing the fundamental pillars in its design.

The students will reinforce their knowledge in specific aspects related to the application of design knowledge to the use of digital construction, investigating and deepening in concepts such as filtration, infiltration, retention and reuse, being these some types of sustainable urban drainage systems. A program that integrates a specialized teaching team and at the same time, supported with quality multimedia content that offers dynamism and comfort with the online modality.

Also, TECH thinks about comfort and excellence, that is why this program offers the most complete and high quality update, being a qualification of great flexibility by only needing a device with internet connection to easily access the Virtual Campus from the comfort of the place where you are.

This **Postgraduate Certificate in Sustainable Urban Drainage System 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 the self-assessment process can be carried out to improve learning
- ◆ Its special emphasis on innovative methodologies
- ◆ Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection work
- ◆ Content that is accessible from any fixed or portable device with an Internet connection



*To improve the sanitation system, SUDS is implemented and only with TECH you will be able to acquire the necessary skills to achieve it in just 6 weeks”*

“

*You will reinforce your knowledge in specific areas related to Parametric Infiltration Section Modeling in Civil 3D through 150 hours of the best theoretical, practical and additional content”*

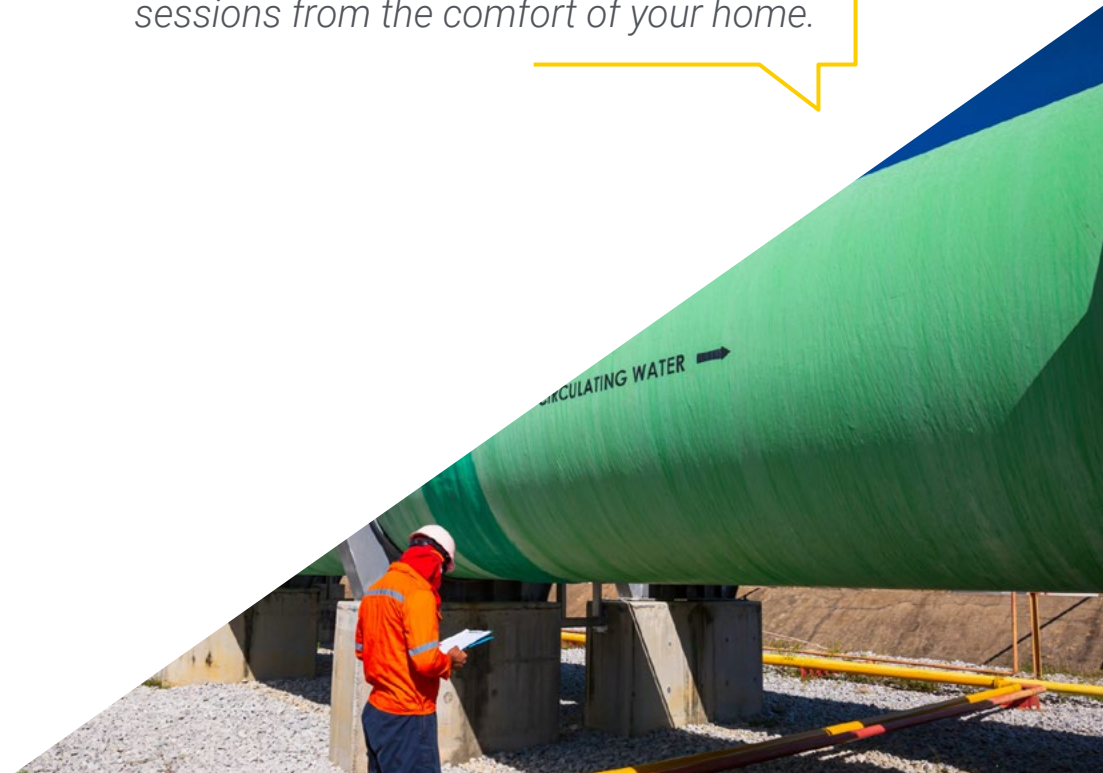
The program's teaching staff includes professionals from the sector who contribute their work experience to this training program, as well as renowned specialists from leading societies and prestigious universities.

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 student will be assisted by an innovative interactive video system created by renowned and experienced experts.

*This Postgraduate Certificate will lead you to apply the fundamental pillars in the design of SUDS through 100% online study.*

*At TECH you have a qualification with great flexibility, without a fixed schedule and you will be able to present your sessions from the comfort of your home.*



# 02

# Objectives

This Postgraduate Certificate in Sustainable Urban Drainage System Design will allow the graduates to acquire the main competencies of the best professionals in this area, managing to fit the most indispensable novelties for the profession and the challenges it faces. Therefore, students will have at their disposal different tools of the highest standards, thus ensuring the success of the program. At the end of the program, the students will have broadened their knowledge of the pillars of SUDS design, where the quantity and quality of water are highlighted, as well as the typologies in relation to their main functions.



DRINKING  
WATER





“

*One of TECH's objectives is to guarantee your professional growth through the implementation of the most innovative material in the sector”*





## General Objectives

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- ◆ Identify the main sustainable drainage systems and their use in urban development
- ◆ Define the fundamental pillars and main definitions related to SUDS
- ◆ Develop new knowledge on SUDS design, choice criteria and identification of solutions
- ◆ Analyze the development of a sustainable drainage network by realizing a digital construction strategy







## Specific Objectives

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- ◆ Specify the background and current problems in the drainage of current urban developments
- ◆ Define the types of SUDS according to their function
- ◆ Develop the fundamental pillars in the design of SUDS
- ◆ Analyze the SUDS for detention, retention, filtration, infiltration and treatment
- ◆ Identify the main design parameters of each typology
- ◆ Specify the use of each one of them
- ◆ Apply the design knowledge to the use of digital construction



*You will achieve your objectives thanks to audiovisual tools, where you will also be accompanied by the best specialists in the field of study”*



# 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 that successfully achieve the development of each of its programs. In this sense, the graduates will have access to content designed by an experienced professional team specialized in Cartography and Topography of Road Works, New Materials Science and Nanotechnology and Civil Engineering. Their robust experience and extensive background in the sector will allow them to resolve doubts or answer questions that may arise during the course.







“

*This program has a highly qualified teaching staff with an emphasis on Civil Engineering”*

## 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 academic program implements a syllabus that provides a robust content in Sustainable Urban Drainage Systems Design through recent studies in the field of Hydraulic Infrastructure. The purpose of this course is to provide the students with exclusive material on the modeling of Sustainable Urban Drainage Systems (SUDS) in Civil 3D. All this by means of multiple multimedia tools that offer dynamism and a greater attractiveness to this university qualification.







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*A study plan made with the purpose of investigating and deepening in the creation of the assembly and creation of the linear work”*

## Module 1. Sustainable Urban Drainage System

- 1.1. Sustainable Urban Drainage System Design
  - 1.1.1. Floor Sealing
  - 1.1.2. Climate Change
  - 1.1.3. Sustainable Drainage System
- 1.2. Sustainable Urban Drainage System Types(SUDS)
  - 1.2.1. Transport
  - 1.2.2. Filtration and Infiltration
  - 1.2.3. Retention and Reuse
- 1.3. Intervention Conditions and Levels
  - 1.3.1. Factors Intrinsic to the Receiving Environment
  - 1.3.2. Physical Factors
  - 1.3.3. Factors Related to Land Use
  - 1.3.4. Socio-environmental Factors
  - 1.3.5. Capacity to Manage Urban Runoff Waters
  - 1.3.6. Sustainable Urban Drainage System Choice(SUDS)
- 1.4. Pillars in the design of SUDS
  - 1.4.1. Water Quantity
  - 1.4.2. Water Quality
  - 1.4.3. Others
  - 1.4.4. Typologies in Relation to their Main Functions
- 1.5. Sustainable Urban Drainage Systems (SUDS) of detention and retention
  - 1.5.1. Detention and Infiltration basins
  - 1.5.2. Vegetable Covers
  - 1.5.3. Cisterns or Rainwater Reservoirs
- 1.6. Sustainable Urban Drainage Systems (SUDS) of Filtration
  - 1.6.1. Filter Strips
  - 1.6.2. Drainage Ditches
  - 1.6.3. Sand Filters
  - 1.6.4. Permeable Pavements





- 1.7. Sustainable Urban Drainage Systems (SUDS) of Infiltration
  - 1.7.1. Structural Cork Oaks
  - 1.7.2. Gardens Rain meadows
  - 1.7.3. Wells and Infiltration Ditches
  - 1.7.4. Reticulated Reservoirs
- 1.8. Sustainable Urban Drainage Systems (SUDS) of Treatment
  - 1.8.1. Floodable Flowerbeds
  - 1.8.2. Vegetated Swales
  - 1.8.3. Artificial Wetlands and Ponds
- 1.9. Civil 3D Model of Parametric Infiltration Sections
  - 1.9.1. Catalog of Parametric Sections
  - 1.9.2. Bioretention
  - 1.9.3. Rain Garden
  - 1.9.4. Permeable Sidewalk
  - 1.9.5. Permeable Pavements
  - 1.9.6. Others
- 1.10. Sustainable Urban Drainage System Modeling(SUDS) in Civil 3D
  - 1.10.1. BIM modeling of SUDS in Civil 3D
  - 1.10.2. Assembly Creation
  - 1.10.3. Creation of the Linear Work



*A program created by highly distinguished faculty and with a focus on SUDS BIM Modeling”*

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 Sustainable Urban Drainage System 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 Sustainable Urban Drainage System 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 Sustainable Urban Drainage System 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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