

# Postgraduate Certificate Geographical Information Systems



## Postgraduate Certificate Geographical Information Systems

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

Website: [www.techtute.com/pk/engineering/postgraduate-certificate/geographical-information-systems](http://www.techtute.com/pk/engineering/postgraduate-certificate/geographical-information-systems)

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# 01

# Introduction

Nowadays, technology is present in the global environment and, consequently, in the control of geographic information. For this reason, and with the needs of engineers in the sector in mind, TECH presents this program in which, during 6 weeks of intensive study, the development phases required for a geographic information system are analyzed. Due to the elements that make up a Geographic Information System to load, manage, analyze and acquire a product result, some specific processes are needed, and the engineer will enhance these through the use of specific software of the GIS environment. All of this, 100% online and adapted to offer the student a comfortable way of study that is totally compatible with other activities.



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*In order to manage and acquire a resulting product, specific processes are needed which the engineer will enhance through the use of specific software for the GIS environment”*

Because of the continuous use of mobile devices, engineers are working on navigation, positioning and GIS environments for land management. This program shows the different software for the creation of maps with vector and raster models, applying spatial analysis for zonal studies, optimal locations or other study projects.

For that reason, this Postgraduate Certificate in Geographic Information Systems goes in depth in a comprehensive way and develops specialized knowledge on everything related to the current legislation that affects the GIS environment, in addition to addressing the parameters and characteristics required to have an adequate quality of cartography.

Thanks to all this, and in only 6 weeks of intensive online study, the student will acquire a deep, current and accurate basis to move confidently in the world of Geographical Information Systems. A unique and complete study opportunity that only TECH could offer.

This **Postgraduate Certificate in Geographical Information Systems** contains the most complete and up-to-date program on the market. The most important features include:

- ◆ Practical cases presented by experts in Geographical Information Systems
- ◆ 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 the self-assessment process can be carried out to improve learning
- ◆ 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



*Position your professional profile at the forefront of a sector that is constantly growing thanks to your specialized knowledge”*

“

*Plan, project and execute a cartographic plan with GIS, thanks to this training offered by TECH”*

The teaching staff of this program includes professionals from the industry, who contribute the experience of their work to this program, in addition to recognized specialists from reference 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 learning 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 student will be assisted by an innovative interactive video system created by renowned and experienced experts.

*Apply the knowledge from this Postgraduate Certificate to your work and improve your performance.*

*Explore the different software for the creation of maps with vector and raster models.*



# 02

# Objectives

This Postgraduate Certificate was created with the objective of offering the engineer a series of knowledge, tools and skills that are ideal for successful development in the world of GIS. TECH brings a 100% online study system, which is shaking the foundations of traditional education. Thanks to this, the engineer benefits from being able to study while continuing their professional and personal activity.







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*You have access to the most complete Postgraduate Certificate on the market, with which you can achieve your professional goals”*



## General Objectives

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- ◆ Plan, design and execute a cartographic plan with Geographic Information Systems (GIS)
- ◆ Gather, review and interpret terrain and geographically related information
- ◆ Plan, design and execute a demographic or other analysis study linked to geographic information
- ◆ Compile, set up and process navigation and GIS systems for implementation on mobile devices



*Do you know everything about  
Geographical Information Systems?  
TECH offers you new tools so that you  
can work more efficiently”*



## Specific Objectives

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- ◆ Analyze the elements, process steps and storage essential to the management of a GIS
- ◆ Develop georeferenced cartographic maps with overlapping layers from various sources using GIS software
- ◆ Evaluate the topological problems that occur in processes with vector models
- ◆ Spatially analyze the different layers required for the project, developing studies of affected areas or specific space searches or other working environments
- ◆ Present projects analyzed by pixel functions and surfaces in raster layers to determine information of interest
- ◆ Work with digital terrain models and modeling, representing and visualizing territorial information on and below the earth's surface
- ◆ Consult routes and navigation *tracks* interacting in mobile device environments

03

# Course Management

This Postgraduate Certificate has a first-class teaching staff that will provide students with all the latest developments in this field. Therefore, the professional who completes this program will master all kinds of technological and computer tools that will allow them to improve the efficiency of their daily work and access to numerous urban planning and engineering projects with GIS.



“

*The best professionals in GIS share their experiences in this Postgraduate Certificate to help you improve your work”*

## Management



### Mr. Puértolas Salañer, Ángel Manuel

- Application development in .Net environment, Python development, SQL Server database management, system administration. ASISPA
- Topographical Surveyor Study and reconstruction of roads and accesses to towns. Ministry of Defence Embedded with UN forces in Lebanon
- Topographical Surveyor Topography per Project Ministry of Defence
- Topographical Surveyor Georeferencing of the old cadastre of the province of Murcia (Spain). Geoinformation and Systems SL
- Technical Engineer in Topography from the Polytechnic University Valencia
- Master's Degree in Cybersecurity from MF Business School and the Camilo José Cela University
- Web management, server administration and task development and automization in Python Milcom
- Development of applications in .Net environment. SQL Server management Own software support Ecomputer



## Professors

### Mr. Aznar Cabotá, Sergio

- ◆ Head of the GIS Department at Idrica
- ◆ GIS Analyst and Developer at Belike
- ◆ GIS Analyst and Developer at Aditelsa
- ◆ GIS Developer at Visual
- ◆ Engineer in Geodesy and Cartography in Valencia by the Polytechnic University of Valencia
- ◆ Technical Engineer in Topography in Valencia by the Polytechnic University of Valencia
- ◆ Professor at the Polytechnic University of Valencia for the University Expert Degree in Digital Technologies for the Agri-Food Sector

# 04

## Structure and Content

TECH brings together a complete, up-to-date and specialized program designed by professionals with extensive experience in the sector. After 6 weeks of study, the graduate will be able to deepen their knowledge on issues such as the visualization of elements in QGIS, Vector model and the Raster model and Open Data, among others. Thanks to this program, the engineer will be able to carry out all tasks and face all the professional challenges they are presented with.





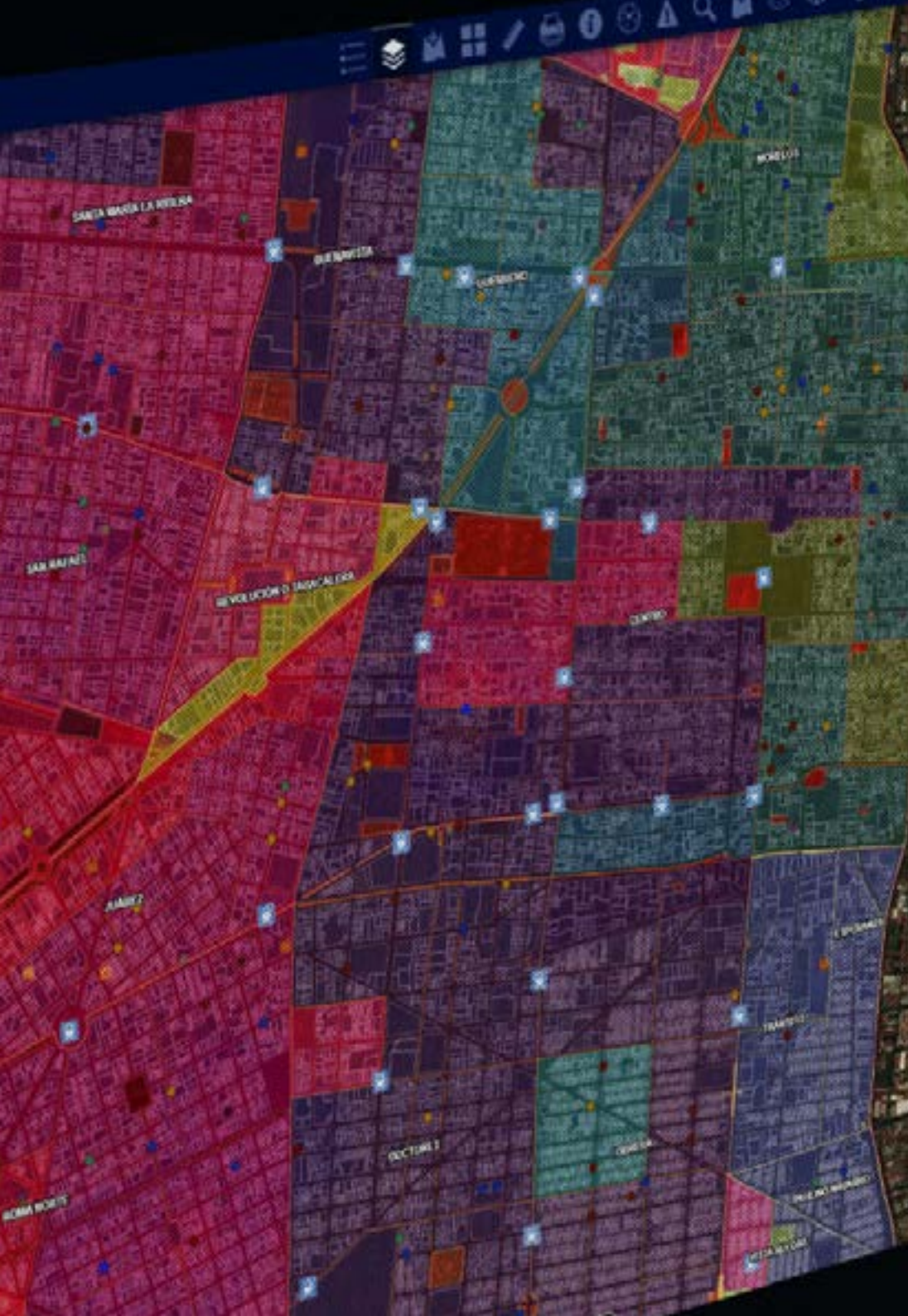


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*You will be a professional engineer of relevance to any company that needs the use of Geographic Information Systems”*

## Module 1. Geographical Information Systems

- 1.1. Geographical Information Systems (GIS)
  - 1.1.1. Geographical Information Systems (GIS)
  - 1.1.2. Differences Between CAD and a GIC
  - 1.1.3. Types of Data Visualizers (Heavy or Light Clients)
  - 1.1.4. Types of Geographical Data
    - 1.1.4.1. Geographic Information
  - 1.1.5. Geographical Representations
- 1.2. Visualization of Elements in QGIS
  - 1.2.1. QGIC Installation
  - 1.2.2. Visualization of Data with QGIS
  - 1.2.3. Labelled Data with QGIS
  - 1.2.4. Overlaying Layers of Different Coverages with QGIS
  - 1.2.5. Maps
    - 1.2.5.1. Parts of a Map
  - 1.2.6. Printing a Plan with QGIS
- 1.3. Vector Model
  - 1.3.1. Types of Vector Geometries
  - 1.3.2. Attribute Tables
  - 1.3.3. Topology
    - 1.3.3.1. Topological Rules
    - 1.3.3.2. Application of Topologies in QGIS
    - 1.3.3.3. Application of Database Topologies
- 1.4. Vector Model. Operators
  - 1.4.1. Functional Criteria
  - 1.4.2. Spatial Analysis Operators
  - 1.4.3. Examples of Geospatial Operations
- 1.5. Generation of a Data Model with a Database
  - 1.5.1. Installation of PostgreSQL and POSTGIS
  - 1.5.2. Creation of a Geospatial Database with PGAdmin
  - 1.5.3. Elements Creation
  - 1.5.4. Geospatial Consultations with POSTGIS
  - 1.5.5. Visualization of Elements of a Database with QGIS
  - 1.5.6. Maps Server
    - 1.5.6.1. Types and Creation of Maps Server with Geoserver
    - 1.5.6.2. Types of WMS/WFS Data Services
    - 1.5.6.3. Visualization of Services in QGIS
- 1.6. Raster Model
  - 1.6.1. Raster Model
  - 1.6.2. Color Bands
  - 1.6.3. Storage in Databases
  - 1.6.4. Raster Calculator
  - 1.6.5. Image Pyramids
- 1.7. Raster Model. Operations
  - 1.7.1. Image Georeferencing
    - 1.7.1.1. Control Points
  - 1.7.2. Raster Functionalities
    - 1.7.2.1. Surface Functions
    - 1.7.2.2. Distance Function
    - 1.7.2.3. Reclassification Functions
    - 1.7.2.4. Superposition Analysis Functions
    - 1.7.2.5. Statistical Analysis Functions
    - 1.7.2.6. Selection Functions
  - 1.7.3. Loading Raster Data into a Database



- 1.8. Practical Applications of Raster Data
  - 1.8.1. Application in the Agrarian Sector
  - 1.8.2. MDE Treatment
  - 1.8.3. Automation of Element Classification on a Raster
  - 1.8.4. Treatment of LIDAR Data
- 1.9. Open Data
  - 1.9.1. Open Street Maps (OSM)
    - 1.10.1.1. Cartographic Editing and Community
  - 1.9.2. Obtaining Free Vector Mapping
  - 1.9.3. Obtaining Free Raster Mapping

“ *In a constantly changing environment, broadening and updating your knowledge is an essential task. TECH provides you with the best content and best online methodology*”

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 Geographical Information Systems 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 Geographical Information Systems** 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 Geographical Information Systems**

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 language  
virtual classroom



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