

# Postgraduate Diploma Information Technology for Geomatics





## Postgraduate Diploma Information Technology for Geomatics

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

Website: [www.techtute.com/us/engineering/postgraduate-diploma/postgraduate-diploma-information-technology-geomatics](http://www.techtute.com/us/engineering/postgraduate-diploma/postgraduate-diploma-information-technology-geomatics)

# Index

01

Introduction

---

*p. 4*

02

Objectives

---

*p. 8*

03

Course Management

---

*p. 12*

04

Structure and Content

---

*p. 16*

05

Methodology

---

*p. 22*

06

Certificate

---

*p. 30*

# 01

# Introduction

Geomatics is responsible for collecting, processing and visually presenting topographic data. For this reason, it is a discipline that is increasingly supported by computer science, which has experienced and continues to experience great advances and to provide new technological solutions to this field of geography and civil engineering. Therefore, this program goes in depth into the latest computer developments in this field, providing the professional with the most innovative tools so that they can carry out their work in an up-to-date and accurate way.



The image features two computer monitors in the foreground. The monitor on the left displays a detailed topographic map with various colored regions and a legend on the right side. The monitor on the right shows a data table or spreadsheet with multiple columns and rows of text. The background is a solid dark orange color, and the overall composition is split diagonally by a white line.

“

*Incorporate the latest IT tools into your work,  
so that you can analyze and present your  
measurement results in the best possible way”*

Information Technology is an essential tool for geomatics. It provides you with numerous digital solutions to process and display the different data collected during any surveying process. However, it is advancing rapidly, and every year, new methods and software emerge that facilitate the surveyor's task, making it more accurate. For this reason, professionals dedicated to this field must be aware of new innovations in order to be able to incorporate them into their daily work.

Therefore, this Postgraduate Diploma in Information Technology for Geomatics offers the latest developments in issues such as Apache web server management, its supported programming languages such as PHP, Pearl and Ruby, Nginx and Tomcat web servers, GeoServer, Grass GIS, OpenJump, backend programming in GIS or programming in R and JavaScript for geographic information systems, among many others.

All this, following an innovative 100% online teaching system that allows students to balance their career with their studies, since the program adapts to their personal circumstances. In addition, you will have access to the best multimedia content such as practical exercises, video procedures, master classes or interactive summaries. Likewise, the student will be guided by the best teaching staff in this specialty, composed of real experts who know all the latest computer developments in the field of geomatics.

This **Postgraduate Diploma in Information Technology for Geomatics** contains the most complete and up-to-date program on the market. The most important features include:

- ◆ Practical cases presented by experts in Information Technology in Geomatics
- ◆ 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
- ◆ Access to content from any fixed or portable device with an Internet connection



*Gain in-depth knowledge in the management of servers such as Apache, Nginx or Tomcat applied to geomatics with this Postgraduate Diploma"*

“*Geomatics is continuously transforming. This program gives you the opportunity to update your knowledge by addressing the latest innovations in information technology in geomatics”*

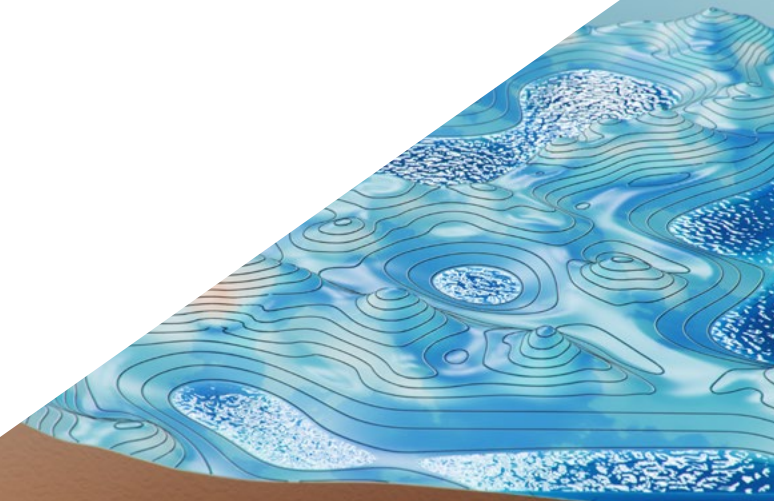
The program's teaching staff includes professionals from the sector who contribute their work experience to this training; as well as renowned specialists from leading societies and prestigious universities.

Thanks to multimedia content developed with the latest educational technology, you will be immersed in situated and contextual learning. In other words, a simulated environment that will provide immersive learning, programmed to train for 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.

*This program will help you to learn the best applications of programming languages such as Pearl, R or JavaScript focused on this discipline.*

*Decide how, when and where to study thanks to the 100% online methodology with which this Postgraduate Diploma is taught.*



# 02 Objectives

The main objective of this Postgraduate Diploma in Information Technology for Geomatics is to offer the professional the most advanced tools to develop their topographic work with the highest precision. For this reason, this program focuses on those new computer skills that students can integrate into their daily work, facilitating it and improving its efficiency. Therefore, at the end of this program, you will be in a position to face the current challenges of geomatics with all the guarantees.







“

*Update your knowledge with this specialized program and start to bring better IT solutions to your topographic measurements and analysis”*



## General Objectives

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- ◆ Evaluate the different database engines and their benefits
- ◆ Analyze the most used web servers with more projection and prestige
- ◆ Develop servers recommended by the geospatial foundation
- ◆ Identify the best *Backend* solutions for specific projects
- ◆ Evaluate different existing desktop, web and mobile clients
- ◆ Analyze different *live* customers
- ◆ Identify the best *Front-end* solutions for specific projects
- ◆ Develop the predominant programming languages in Geomatics
- ◆ Examine these languages as a means of connection to databases
- ◆ Justify the most appropriate environment for the use of one language or the other
- ◆ Evaluate the use of each language and its usefulness in painting maps and presenting other results





## Specific Objectives

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### Module 1. Backend for GIS

- ◆ Generate specialized knowledge about Apache server to share results online
- ◆ Evaluating Nginx server as an alternative to Apache server
- ◆ Analyze the Tomcat server as an application server and other application servers
- ◆ Browse MySQL, Postgres and SQLite database engine
- ◆ Determine which motor of databases to choose for a specific project

### Module 2. Clients for GIS

- ◆ Evaluate the requirements for different clients
- ◆ Analyze the capabilities of using different *Plugins* and the customization capabilities of the clients
- ◆ Introduce the different clients and the programming languages they use
- ◆ Examine the different options available to a user
- ◆ Develop use cases for different customers
- ◆ Generate a source of knowledge to discern which client to use for which project

### Module 3. Programming for Geomatics

- ◆ Configure PHP and examine its usage requirements
- ◆ Present the stored data in an attractive way
- ◆ Analyze control and iteration structures in different languages
- ◆ Determine how to connect to databases located on different servers or in the Cloud
- ◆ Examine the possibilities of using languages for web applications and mobile devices
- ◆ Develop use cases for the different languages
- ◆ Generate a source of knowledge to discern which language to use for each project, backend server or desktop client

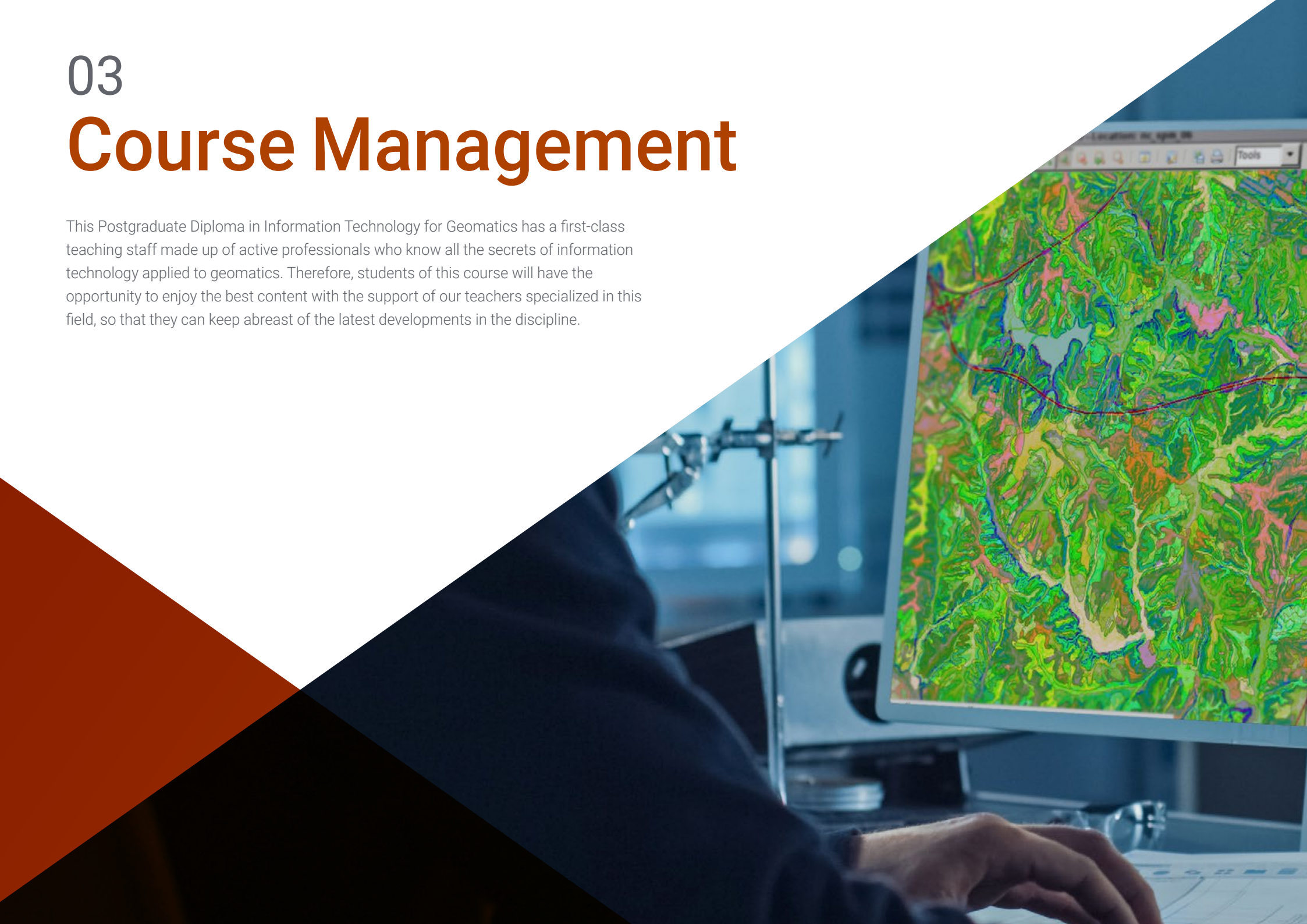


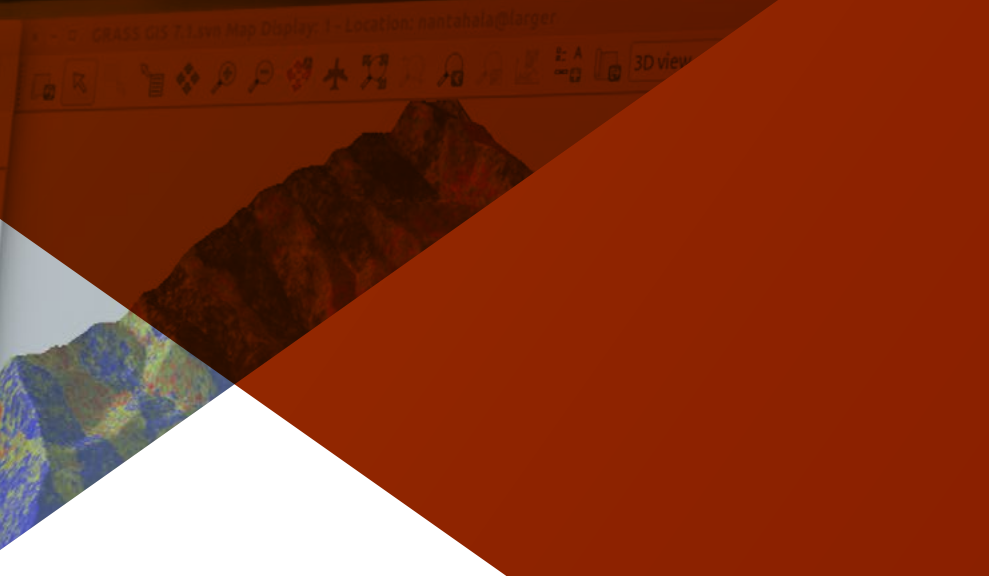
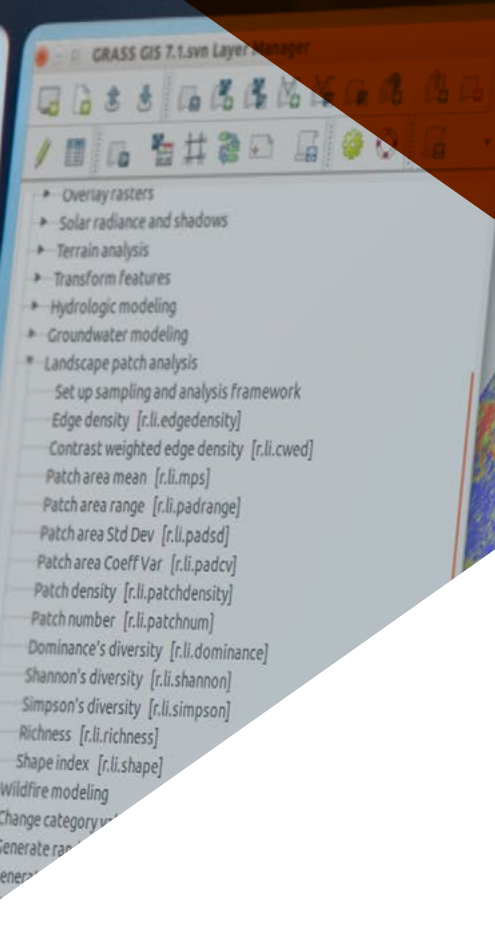
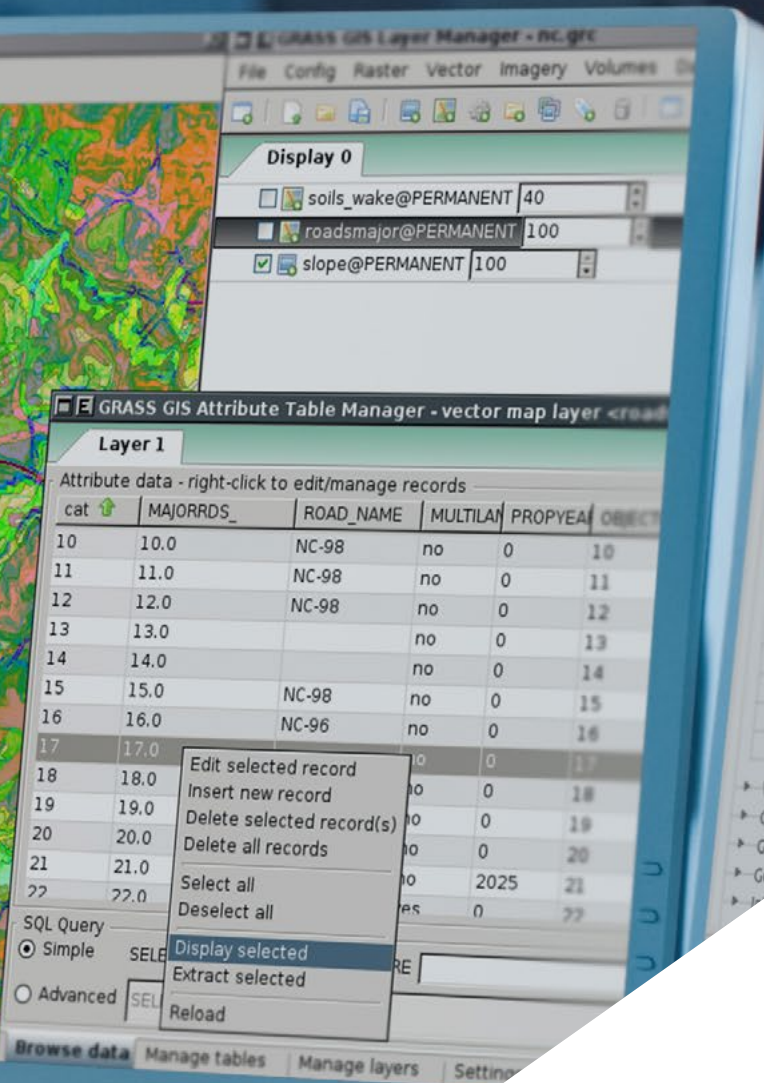
*Information technology has undergone major evolutions in recent years, and you need a program like this to get up to speed. Enroll now”*

# 03

# Course Management

This Postgraduate Diploma in Information Technology for Geomatics has a first-class teaching staff made up of active professionals who know all the secrets of information technology applied to geomatics. Therefore, students of this course will have the opportunity to enjoy the best content with the support of our teachers specialized in this field, so that they can keep abreast of the latest developments in the discipline.





“

The latest advances in computer science applied to geomatics, with the help of the best professors”

## 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 S.L
- ◆ 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. Flores Caba, Juan Antonio

- ◆ Technological Consultant
- ◆ Integrator at Alcatel-Lucent in MiViewTv product (Imagenio)
- ◆ Systems and Network Manager at Kimia Solutions
- ◆ Systems and Network Technician at Qindel for projects at Vodafone
- ◆ Systems and Network Manager at Spantel
- ◆ Systems and Network Manager in Access to the Spanish Internet Network
- ◆ Univeristy studies Telecommunication Engineering from the University of Malaga
- ◆ Bachelor's Degree studies in Mathematics



Monasterio de Santa Clara

Iglesia de San Luis

Convento de Santa Isabel

Convento de Santa Paula

Cuartel de El Carmen

Palacio de Las Dueñas

Jardines de El Valle

Parlamento Andaluz

Monasterio de San Isidoro

Iglesia de San Pedro

Convento de Santa Catalina

Museo de Bellas Artes

Antigua Universidad

Casa de Pilatos

Ayuntamiento

Palacio Arzobispal

Iglesia de Santa Cruz

Plaza de toros

Catedral y Giralda

Archivo de Indias

Alcazar

# 04

# Structure and Content

This Postgraduate Diploma in Information Technology for Geomatics is structured into 3 specialized modules through which the student will be able to deepen their knowledge of the most recent advances in issues such as: QGIS Server and its installation in Linux distributions such as Ubuntu, Kosmo Desktop, Tile Mill, PHP syntax and control structures when programming for *Backend*, Python programming or R programming, among many others.







“

*You won't find content more innovative than this on programming for geomatics”*

## Module 1. Backend for GIS

- 1.1. Apache Web Server
  - 1.1.1. Apache Web Server
  - 1.1.2. Installation
  - 1.1.3. Anatomy of the Apache Server
    - 1.1.3.1. Standard Content Folders
    - 1.1.3.2. Logs
  - 1.1.4. Settings
  - 1.1.5. Support Programming Languages
    - 1.1.5.1. Php
    - 1.1.5.2. Perl
    - 1.1.5.3. Ruby
    - 1.1.5.4. Others
- 1.2. Nginx Web Server
  - 1.2.1. Nginx Web Server
  - 1.2.2. Installation
  - 1.2.3. Features
- 1.3. Tomcat Web Server
  - 1.3.1. Tomcat Web Server
  - 1.3.2. Installation
  - 1.3.3. Maven *Plugin*
  - 1.3.4. Connectors
- 1.4. GeoServer
  - 1.4.1. GeoServer
  - 1.4.2. Installation
  - 1.4.3. Using the ImageMosaic *Plugin*
- 1.5. MapServer
  - 1.5.1. MapServer
  - 1.5.2. Installation
  - 1.5.3. Mapfile
  - 1.5.4. MapScript
  - 1.5.5. MapCache
- 1.6. Deegree
  - 1.6.1. Deegree
  - 1.6.2. Characteristics of Deegree
  - 1.6.3. Installation
  - 1.6.4. Settings
  - 1.6.5. Use
- 1.7. QGIS Server
  - 1.7.1. QGIS Server
  - 1.7.2. Installation in Ubuntu
  - 1.7.3. Capabilities
  - 1.7.4. Settings
  - 1.7.5. Use
- 1.8. PostgreSQL
  - 1.8.1. PostgreSQL
  - 1.8.2. Installation
  - 1.8.3. Postgis
  - 1.8.4. PgAdmin
- 1.9. SQLite
  - 1.9.1. SQLite
  - 1.9.2. Spatialite
  - 1.9.3. Spatialite-gui
  - 1.9.4. Spatialite-tools
    - 1.9.4.1. General Tools
    - 1.9.4.2. OSM Tools
    - 1.9.4.3. XML Tools
    - 1.9.4.4. VirtualPG
- 1.10. MySQL
  - 1.10.1. MySQL
  - 1.10.2. Spatial Data Types
  - 1.10.3. phpMyAdmin

## Module 2. Clients for GIS

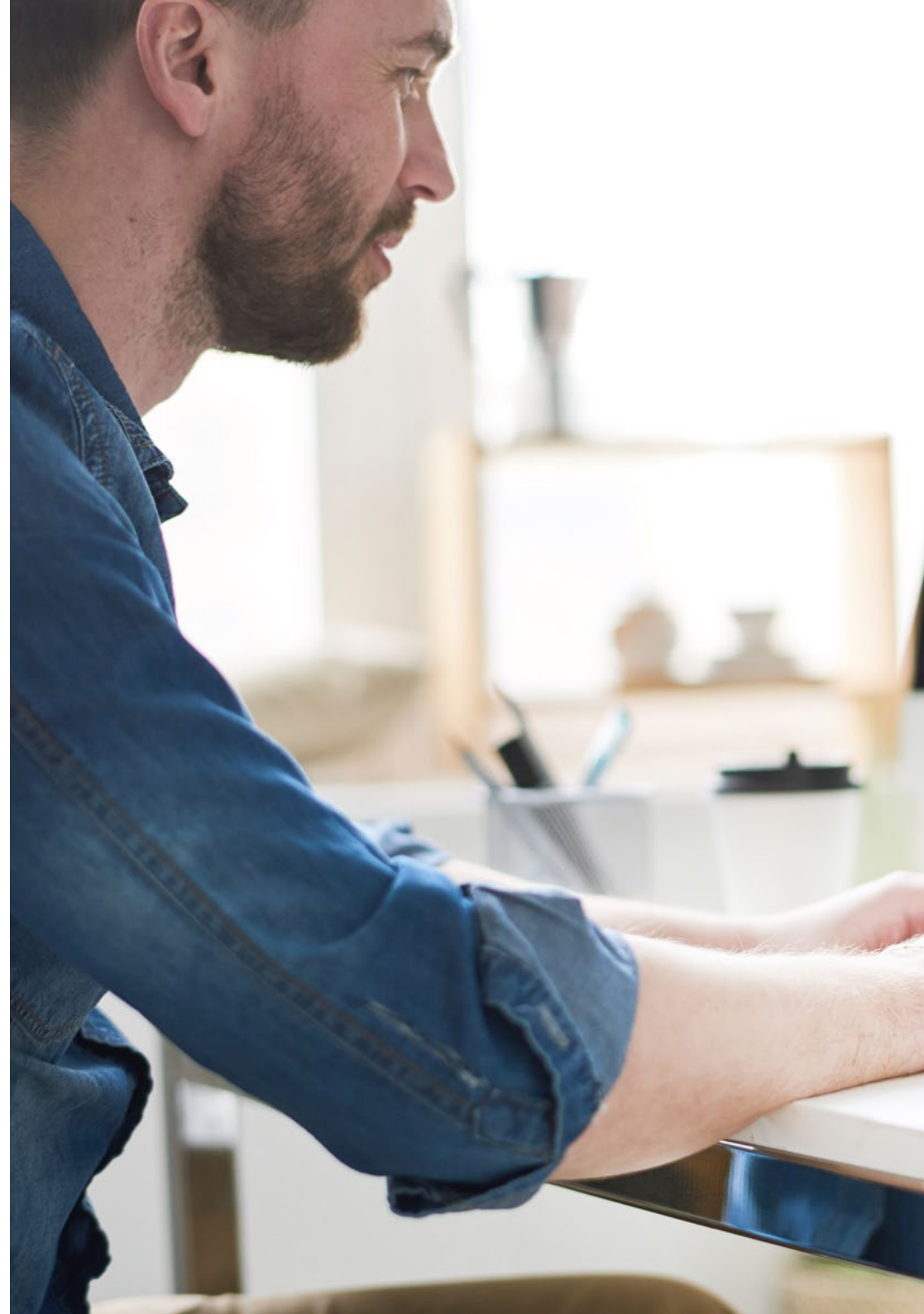
- 2.1. Grass GIS
  - 2.1.1. Grass GIS
  - 2.1.2. Components of the Graphic Interface
  - 2.1.3. Commands of the Graphic Interface
  - 2.1.4. Processing
- 2.2. Kosmo Desktop
  - 2.2.1. Kosmo Desktop
  - 2.2.2. Installation
  - 2.2.3. Features
- 2.3. OpenJump
  - 2.3.1. OpenJump
  - 2.3.2. Installation
  - 2.3.3. *Plugins*
- 2.4. QGIS
  - 2.4.1. QGIS
  - 2.4.2. Installation
  - 2.4.3. Orfeo Toolbox
- 2.5. Tile Mill
  - 2.5.1. Tile Mill
  - 2.5.2. Installation
  - 2.5.3. Map Creation from a CSV
- 2.6. gvSIG
  - 2.6.1. gvSIG
  - 2.6.2. Installation
  - 2.6.3. Case Uses
  - 2.6.4. *Scripts* Repository
- 2.7. uDig
  - 2.7.1. uDig
  - 2.7.2. Installation
  - 2.7.3. Features
  - 2.7.4. Use

- 2.8. Leaflet
  - 2.8.1. Leaflet
  - 2.8.2. Installation
  - 2.8.3. Plugins
- 2.9. Mapbender
  - 2.9.1. Mapbender
  - 2.9.2. Features
  - 2.9.3. Installation
  - 2.9.4. Settings
  - 2.9.5. Use
- 2.10. OpenLayers
  - 2.10.1. OpenLayers
  - 2.10.2. Features
  - 2.10.3. Installation

## Module 3. Programming for Geomatics

- 3.1. Programming for *Backend* in GIS. PHP Installation and Configuration
  - 3.1.1. Programming for *Backend* in GIS
  - 3.1.2. PHP Installation
  - 3.1.3. Configuration: The php.ini File
- 3.2. Programming for Backend in GIS. Syntax and Control Structures in PHP
  - 3.2.1. Syntax
  - 3.2.2. Types of Data
  - 3.2.3. Control Structures
    - 3.2.3.1. Simple Selection Structures
    - 3.2.3.2. Iteration Structures - While
    - 3.2.3.3. Intervention Structures - For
  - 3.2.4. Functions
- 3.3. Programming for Backend in GIS. Database and PHP Connections
  - 3.3.1. Connections for MySQL Database
  - 3.3.2. Connections for PostgreSQL Database
  - 3.3.3. Connections for SQLite Database

- 3.4. Programming in Python for GIS. Installation, Syntax and Functions
  - 3.4.1. Programming in Python for GIS
  - 3.4.2. Installation
  - 3.4.3. Variables:
  - 3.4.4. Expressions and Operators
  - 3.4.5. Functions
  - 3.4.6. Working with *Strings*
    - 3.4.6.1. Formatting *Strings*
    - 3.4.6.2. Arguments
    - 3.4.6.3. Common Expressions
- 3.5. Programming in Python for GIS. Control Structures and Error Treatment
  - 3.5.1. Simple Selection Structures
  - 3.5.2. Iteration Structures - While
  - 3.5.3. Intervention Structures - For
  - 3.5.4. Error Treatment
- 3.6. Programming in Python for GIS. Access to Databases
  - 3.6.1. MySQL Database Access
  - 3.6.2. PostgreSQL Database Access
  - 3.6.3. SQLite Access to Databases
- 3.7. Programming in R for GIS. Installation and Basic Syntax
  - 3.7.1. Programming in R for GIS
  - 3.7.2. Packet Installation
  - 3.7.3. Basic R Syntax
- 3.8. Programming in R for GIS. Control Structures and Functions
  - 3.8.1. Simple Selection Structures
  - 3.8.2. Loops
  - 3.8.3. Functions
  - 3.8.4. Types of Data
    - 3.8.4.1. Lists
    - 3.8.4.2. Vectors
    - 3.8.4.3. Factors
    - 3.8.4.4. Dataframes



- 3.9. Programming in R for GIS. Access to Databases
  - 3.9.1. Connection to Mysql with Rstudio
  - 3.9.2. Integrating PostgreSQL - PostGIS in R
  - 3.9.3. Use of JDBC in R
- 3.10. Programming in JavaScript for GIS
  - 3.10.1. Programming in JavaScript for GIS
  - 3.10.2. Features
  - 3.10.3. NodeJS

“

*The best content, presented through  
the best teaching methodology on the  
educational market”*

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 Diploma in Information Technology for Geomatics guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma 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”*

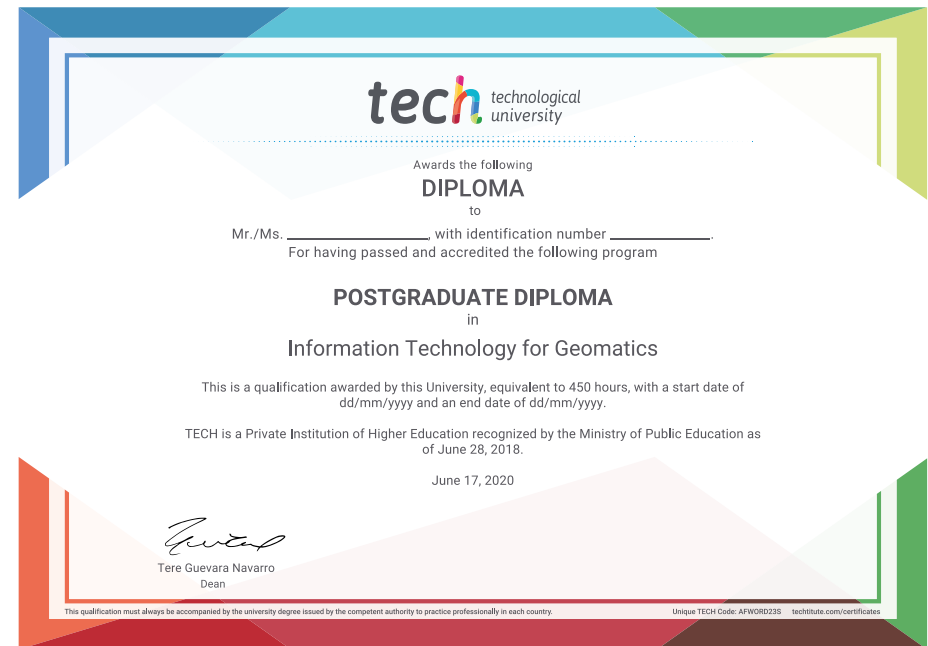
This **Postgraduate Diploma in Information Technology for Geomatics** contains the most complete and up-to-date program on the market.

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

The diploma issued by **TECH Technological University** will reflect the qualification obtained in the Postgraduate Diploma, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Postgraduate Diploma in Information Technology for Geomatics**

Official Number of Hours: **450 h.**



\*Apostille Convention. In the event that the student wishes to have their paper diploma 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

**tech** technological  
university

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