

# Postgraduate Certificate Quality Scalable Software





## Postgraduate Certificate Quality Scalable Software

- » Modality: online
- » Duration: 12 weeks
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtitute.com/pk/information-technology/postgraduate-certificate/quality-scalable-software](http://www.techtitute.com/pk/information-technology/postgraduate-certificate/quality-scalable-software)

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# 01

# Introduction

Every computer system serves a purpose, including advantages such as automation, accuracy, cost-effectiveness and easy access to data, which must be considered by the professional at the time of development. Achieving security, high speed, scalability and reliability, implies the implementation of a sustainable architecture and the design of a database that will imprint quality on the project. Doing it professionally requires specialized knowledge, that is why in this 12-week study program, the student will get the skills to develop quality scalable software, guided by experts in the field and through the Relearning methodology that will allow a fast and efficient process.







“

*In this Postgraduate Certificate, you will learn when to apply the DevOps culture in a business environment, analyzing the different problems that arise and how to solve them efficiently. Enroll now and qualify in 6 weeks"*

The permeability to adjust its size or configuration to changing circumstances makes a system scalable. Improving its performance according to the needs of the environment allows the desired effectiveness. To achieve this, the IT professional must understand how the software life cycle works and how they can contribute to the design and architecture of scalable systems, both at the existing level and in future development visions.

This Postgraduate Certificate in Quality Scalable Software focuses on the theoretical and practical concepts of software architectures, life cycle and the actual practical approach to quality development. Provides specialized knowledge on the process of designing, developing and maintaining a database in terms of standards and performance measures.

With the aim that the graduate will be able to refactor and deal with data management and coordination. As well as, to design scalable architectures that provide high quality levels to your software developments and improve your professionalism standard within the current business model, either as a group or individually.

All this is possible through the modern study system of TECH Technological University, at the forefront of university education, which implements a 100% online methodology based on Relearning, which facilitates the learning process to the professional, without large investments of time and effort. In this way, students can balance their daily responsibilities with professional education and graduate in a maximum of 12 weeks, accompanied by experts who will guide them through the entire process.

This **Postgraduate Certificate in Quality Scalable Software** contains the most complete and up-to-date program on the market. Its most notable features are:

- ◆ Case studies presented by experts in software development
- ◆ The graphic, schematic, and practical contents with which they are created, provide 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 for experts and individual reflection work
- ◆ Content that is accessible from any fixed or portable device with an Internet connection



*To obtain Scalable Quality Software it is essential to master specific techniques. With this course, you will achieve it in 12 weeks. Enroll now”*

“

*TECH provides you with an individualized educational itinerary that is composed of the best teaching resources that are structured in a repetitive and targeted way, so that you can learn efficiently”*

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.

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 training programmed to train 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 during the academic year. For this purpose, the student will be assisted by an innovative interactive video system created by renowned and experienced experts.

*With this program, you will learn how to elaborate a sustainable, efficient and quality architecture in the software projects you are presented with.*

*Improve the performance of your systems with the tools obtained in this course.*



# 02 Objectives

Determine the key points for database performance and understand the impact of an architecture in the software lifecycle, with its advantages, limitations and tools to help, will lead the professional to obtain quality scalable software. This is the purpose of this program, which will allow the graduate to stand out in the fulfillment of their functions within a modern and demanding environment, adapting new techniques and methodologies to their current procedures.





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*Raise your level of professionalism and efficiency in current and future projects with the knowledge acquired in this Postgraduate Certificate”*



## General Objectives

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- ◆ Develop the criteria, tasks and advanced methodologies to understand the relevance of quality-oriented work
- ◆ Analyze the key factors in the quality of a software project
- ◆ Develop the relevant regulatory aspects
- ◆ Implement DevOps and systems processes for Quality Assurance
- ◆ Reduce the technical debt of projects with a quality approach rather than an approach based on economics and short deadlines
- ◆ Provide the student with specialized knowledge to be able to measure and quantify the quality of a software project
- ◆ Defend the economic proposals of projects on the basis of the quality approach



*Specializing in the operation of an OLAP data warehouse system will be possible with the completion of this program. Start now”*





## Specific Objectives

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- ◆ Assess the use of the Entity-Relationship Model for the preliminary design of a database
- ◆ Apply an entity, attribute, key, etc. for the best data integrity
- ◆ Assess the dependencies, forms and rules of database normalization
- ◆ Specialize in the operation of an OLAP data warehouse system, developing and using both fact and dimension tables
- ◆ Determine the key points for database performance
- ◆ Complete proposed real-world simulation cases as ongoing learning of database design, normalization, and performance
- ◆ Establish in the simulation cases, the options to resolve in the creation of the database from a constructive point of view
- ◆ Develop the concept of software architecture and its characteristics
- ◆ Determine the different types of scalability in software architecture
- ◆ Analyze the different levels that can occur in a web scalability
- ◆ Acquire specialized knowledge of the software life cycle concept, stages and models
- ◆ Determine the impact of an architecture on the software life cycle, with its advantages, limitations and support tools
- ◆ Complete proposed real simulation cases, as a continuous learning of the architecture and life cycle of the software
- ◆ Evaluate, in the simulation cases, to what extent it may be feasible or unnecessary to use the software



# 03

## Course Management

Expert computer engineers make up the teaching staff of this Postgraduate Certificate. Their extensive experience and knowledge in software development offer this program a high level of demanding and quality content, appropriate to TECH's study policy. These professionals will be in charge of teaching through a 100% online *relearning* methodology, and a varied list of materials that will make the learning process much more dynamic and easy.





“

*TECH has selected the most qualified and outstanding professionals in their field to offer you the most exclusive refresher programs”*

## Management



### Mr. Molina Molina, Jerónimo

- AI Engineer & Software Architect. NASSAT - Internet Satellite in Motion
- Senior Consultant at Hexa Ingenieros. Introducer of Artificial Intelligence (ML and CV)
- Expert in artificial intelligence based solutions in the fields of Computer Vision, ML/DL and NLP. Currently investigating application possibilities of Transformers and Reinforcement Learning in a personal research project
- University Expert in Business Creation and Development. Bancaixa – FUNDEUN Alicante
- Computer Engineer. University of Alicante
- Master in Artificial Intelligence. Catholic University of Avila
- Executive MBA. European Business Campus Forum





# 04

# Structure and Content

The professional is guaranteed a progressive and natural teaching of the most important terms and concepts about quality scalable software, thanks to the diversity of audiovisual content and other formats, which are transmitted through TECH Technological University's virtual campus, through a modern and 100% online methodology. An academic program with the most rigorous content divided into 2 modules that adapt to the reality of the student, who will be able to balance their professionalization process with their daily life.





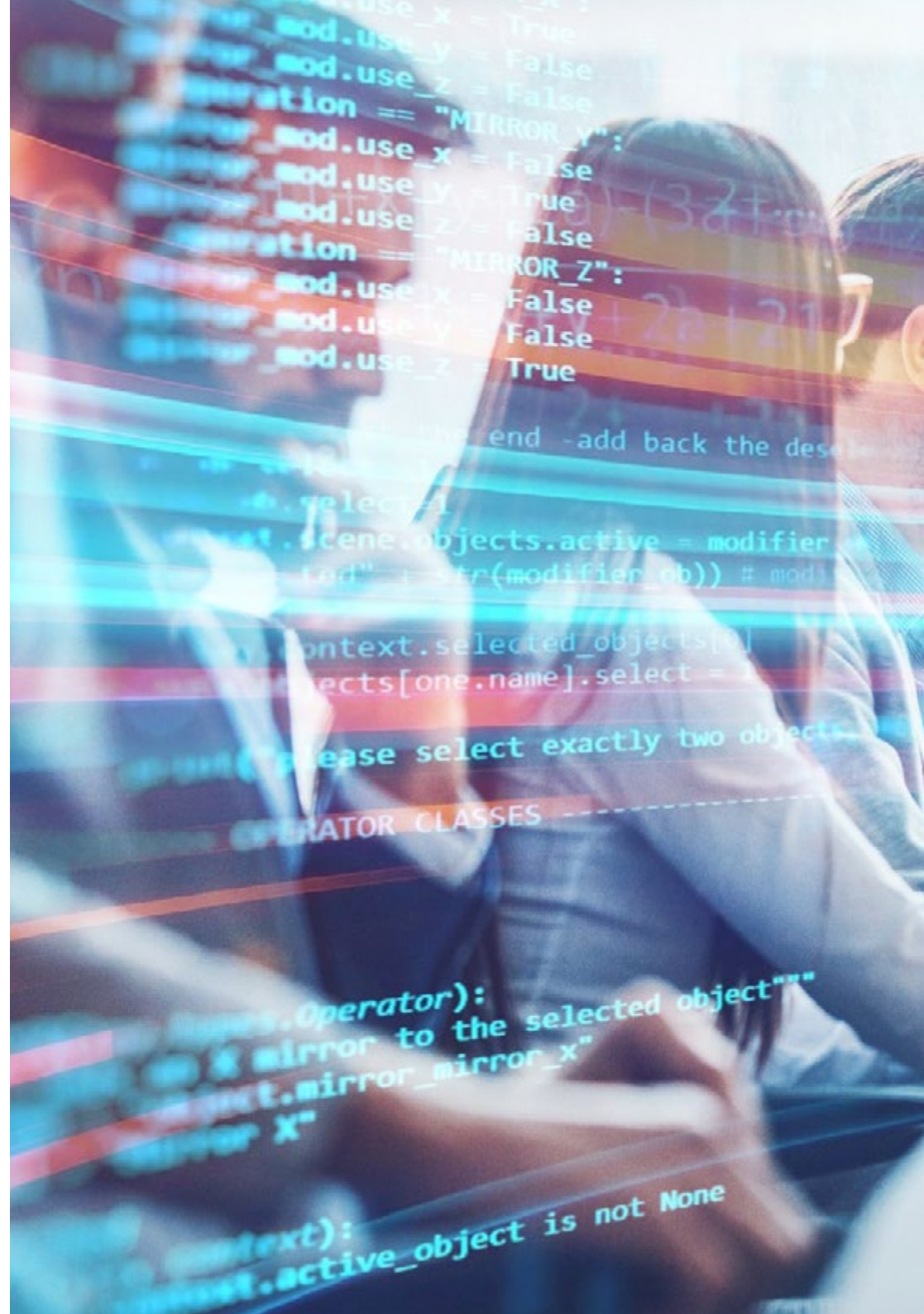


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*Exclusive content rigorously selected by experts in the field will provide you with a high-quality qualification”*

**Module 1.** Database (DB) Design. Standardization and performance.  
Software Quality

- 1.1. Database Design
  - 1.1.1. Databases. Typology
  - 1.1.2. Databases Currently Used
    - 1.1.2.1. Relationship
    - 1.1.2.2. Key-Value
    - 1.1.2.3. Based on Graphs
  - 1.1.3. Data Quality
- 1.2. Entity-Relationship Model Design (I)
  - 1.2.1. Entity-Relationship Model. Quality and Documentation
  - 1.2.2. Entities
    - 1.2.2.1. Strong Entity
    - 1.2.2.2. Weak Entity
  - 1.2.3. Attributes
  - 1.2.4. Set of Relationships
    - 1.2.4.1. 1 to 1
    - 1.2.4.2. 1 to Many
    - 1.2.4.3. Many to 1
    - 1.2.4.4. Many to Many
  - 1.2.5. Keys
    - 1.2.5.1. Primary Key
    - 1.2.5.2. Foreign Key
    - 1.2.5.3. Weak Entity Primary Key
  - 1.2.6. Restrictions
  - 1.2.7. Cardinality
  - 1.2.8. Heritage
  - 1.2.9. Aggregation
- 1.3. Entity-Relationship Model (II). Tools
  - 1.3.1. Entity-Relationship Model. Tools
  - 1.3.2. Entity-Relationship Model. Practical Example
  - 1.3.3. Feasible Entity-Relationship Model
    - 1.3.3.1. Visual Sample
    - 1.3.3.2. Sample in Table Representation





- 1.4. Database (DB) Standardization (I). Software Quality Considerations
  - 1.4.1. DB Standardization and Quality
  - 1.4.2. Dependency
    - 1.4.2.1. Functional Dependence
    - 1.4.2.2. Properties of Functional Dependence
    - 1.4.2.3. Deduced Properties
  - 1.4.3. Keys
- 1.5. Database (DB) Normalization (II). Normal Forms and Codd Rules
  - 1.5.1. Normal Shapes
    - 1.5.1.1. First Normal Form (1FN)
    - 1.5.1.2. Second Normal Form (2FN)
    - 1.5.1.3. Third Normal Form (3FN)
    - 1.5.1.4. Boyce-Codd Normal Form (BCNF)
    - 1.5.1.5. Fourth Normal Form (4FN)
    - 1.5.1.6. Fifth Normal Form (5FN)
  - 1.5.2. Codd's Rules
    - 1.5.2.1. Rule 1: Information
    - 1.5.2.2. Rule 2: Guaranteed Access
    - 1.5.2.3. Rule 3: Systematic Treatment of Null Values
    - 1.5.2.4. Rule 4: Description of the Database
    - 1.5.2.5. Rule 5: Integral Sub-Language
    - 1.5.2.6. Rule 6: View Update
    - 1.5.2.7. Rule 7: Insert and Update
    - 1.5.2.8. Rule 8: Physical Independence
    - 1.5.2.9. Rule 9: Logical Independence
    - 1.5.2.10. Rule 10: Integrity Independence
      - 1.5.2.10.1. Integrity Rules
    - 1.5.2.11. Rule 11: Distribution
    - 1.5.2.12. Rule 12: Non-Subversion
  - 1.5.3. Practical Example

- 1.6. Data Warehouse/OLAP System
  - 1.6.1. Data Warehouse
  - 1.6.2. Fact Table
  - 1.6.3. Dimension Table
  - 1.6.4. Creation of the OLAP System. Tools
- 1.7. Database (DB) Performance
  - 1.7.1. Index Optimization
  - 1.7.2. Query Optimization
  - 1.7.3. Table Partitioning
- 1.8. Simulation of Real Project for DB Design (I)
  - 1.8.1. Project Overview (Company A)
  - 1.8.2. Database Design Application
  - 1.8.3. Proposed Exercises
  - 1.8.4. Proposed Exercises Feedback
- 1.9. Simulation of Real Project for BD Design (II)
  - 1.9.1. Project Overview (Company B)
  - 1.9.2. Application of Database Design
  - 1.9.3. Proposed Exercises
  - 1.9.4. Proposed Exercises Feedback
- 1.10. Relevance of DB Optimization to Software Quality
  - 1.10.1. Design Optimization
  - 1.10.2. Query Code Optimization
  - 1.10.3. Stored Procedure Code Optimization
  - 1.10.4. Influence of Triggers on Software Quality. Recommendations for Use

## Module 2. Scalable Architecture Design Architecture in the Software Life Cycle

- 2.1. Design of Scalable Architectures (I)
  - 2.1.1. Scalable Architectures
  - 2.1.2. Principles of a Scalable Architecture
    - 2.1.2.1. Reliable
    - 2.1.2.2. Scalable
    - 2.1.2.3. Maintainable
  - 2.1.3. Types of Scalability
    - 2.1.3.1. Vertical
    - 2.1.3.2. Horizontal
    - 2.1.3.3. Combined
- 2.2. Architecture DDD (Domain-Driven Design)
  - 2.2.1. The DDD Model Domain Orientation
  - 2.2.2. Layers, Distribution of Responsibility and Design Patterns
  - 2.2.3. Decoupling as a Basis for Quality
- 2.3. Design of Scalable Architectures (II). Benefits, Limitations and Design Strategies
  - 2.3.1. Scalable Architecture. Benefits
  - 2.3.2. Scalable Architecture. Limitations
  - 2.3.3. Strategies for the Development of Scalable Architectures (Descriptive Table)
- 2.4. Software Life Cycle (I). Stages
  - 2.4.1. Software Life Cycle
    - 2.4.1.1. Planning Stage
    - 2.4.1.2. Analysis Stage
    - 2.4.1.3. Design Stage
    - 2.4.1.4. Implementation Stage
    - 2.4.1.5. Testing Stage
    - 2.4.1.6. Installation/Deployment Stage
    - 2.4.1.7. Use and Maintenance Stage





- 2.5. Software Life Cycle Models
  - 2.5.1. Waterfall Model
  - 2.5.2. Repetitive Model
  - 2.5.3. Spiral Model
  - 2.5.4. Big Bang Model
- 2.6. Software Life Cycle (II). Automation
  - 2.6.1. Software Development Life Cycle. Solutions
    - 2.6.1.1. Continuous Integration and Development (CI/CD)
    - 2.6.1.2. Agile Methodologies
    - 2.6.1.3. DevOps/Production Operations
  - 2.6.2. Future Trends
  - 2.6.3. Practical Examples
- 2.7. Software Architecture in the Software Life Cycle
  - 2.7.1. Benefits
  - 2.7.2. Limitations
  - 2.7.3. Tools
- 2.8. Real Project Simulation for Software Architecture Design (I)
  - 2.8.1. Project Overview (Company A)
  - 2.8.2. Software Architecture Design Application
  - 2.8.3. Proposed Exercises
  - 2.8.4. Proposed Exercises Feedback
- 2.9. Simulation of a Real Project for Software Architecture Design (II)
  - 2.9.1. Project Overview (Company B)
  - 2.9.2. Software Architecture Design Application
  - 2.9.3. Proposed Exercises
  - 2.9.4. Proposed Exercises Feedback
- 2.10. Simulation of a Real Project for Software Architecture Design (III)
  - 2.10.1. General Description of the Project (Company C)
  - 2.10.2. Software Architecture Design Application
  - 2.10.3. Proposed Exercises
  - 2.10.4. Proposed Exercises Feedback



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.*





### 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 student will learn to solve complex situations in real business environments through collaborative activities and real cases.*

The case method has been the most widely used learning system among the world's leading Information Technology schools for as long as they have existed. 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 course, students 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 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.



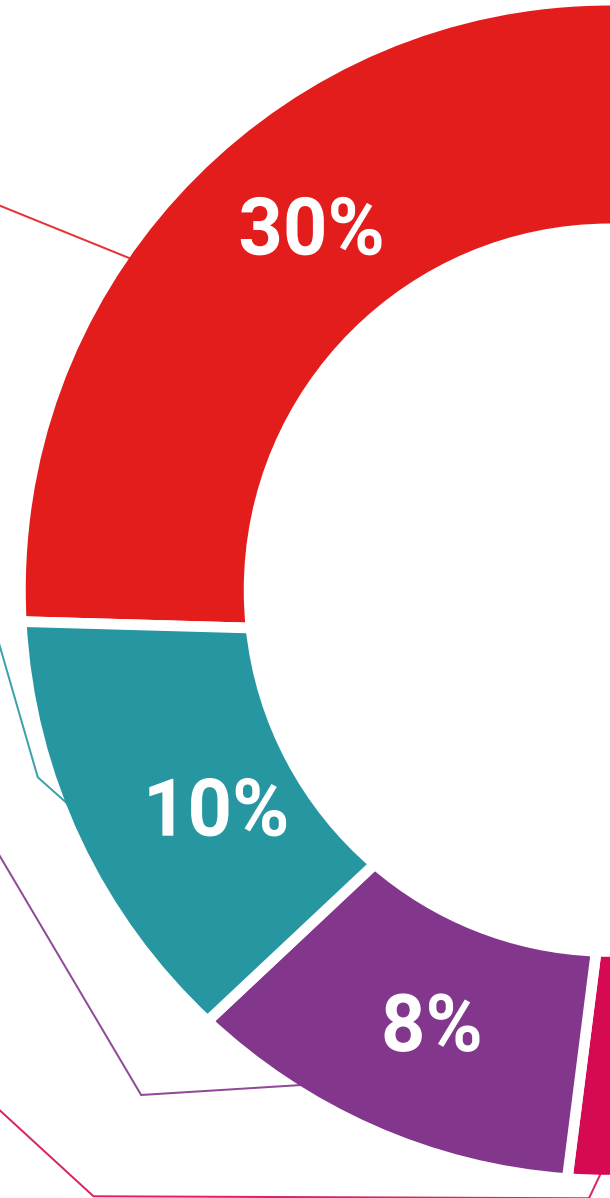
### Practising Skills and Abilities

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 Quality Scalable Software 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 Quality Scalable Software** 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 Quality Scalable Software**

Official N° of hours: **300 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 quality  
development languages  
virtual classroom



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