Postgraduate Diploma

Quality in Software Development

tech technological university

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Postgraduate Diploma
Quality in Software Development

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

Website: www.techtitute.com/in/information-technology/postgraduate-diploma/postgraduate-diploma-quality-software-development

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01

Introduction

The objective of every project is to develop software of the best possible quality, which meets and, in any case, exceeds user expectations. For this, it is essential for the professional to comply with the processes, appropriate forms and be aware of the importance of software quality, mastering as an expert all the necessary elements and requirements. After completing this program, graduates will be able to find practical solutions, manage databases correctly and have a broad knowledge of the design of scalable architectures. A qualification achieved in just a few months, through the best online study system and guided by expert teachers.

With this program, you will develop specialized knowledge about scalable architecture, software lifecycle, data management, DevOps and continuous integration"

Software quality is related to the project's own characteristics that can be controlled and assured. An IT professional must always be focused on quality and knows that software needs to be up to date to meet user needs. Software quality has been around for 30 to 50 years and today, more than ever, it is present when we want to eliminate the years of technical debt. This term summarizes the errors found in the present, of those developments based on quick deliveries and without future estimates. Now those years of speed and lenient criteria are taking their toll on many suppliers and many customers.

In this program, students will analyze the problems that arise in the business world, justifying the implementation of the DevOps culture, obtaining a global and comprehensive vision of the entire ecosystem necessary for a good implementation of the same. From human policies, product or management requirements, to the theoretical and practical implementation of the necessary processes. Being able to create and adapt the complete software delivery cycle according to specific needs, taking into account economic and security considerations.

In addition, students will develop specialized knowledge on the design, development and maintenance of a database in terms of standards and performance measures. Being able to refactor and deal with data management and coordination.

Finally, in one of the modules of this program it will be shown that the software life cycle can contribute to the design and architecture of scalable systems, both at the existing level and in future development visions. The graduate will be able to elaborate a sustainable, efficient and quality architecture in the software projects presented to them.

To make this possible, TECH Technological University has assembled a group of experts in the area that will transmit the most up-to-date knowledge and experience. There will be 3 modules divided into various units and subunits that will make it possible to learn in 6 months, following the Relearning methodology and 100% online, which facilitates memorization and learning in an agile and efficient way, through a secure platform that allows students to download the content they need for future reference.

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

- The development of case studies presented by experts in software development
- The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- Practical exercises where self-assessment can be used to improve learning
- Its special emphasis on innovative methodologies
- Theoretical lessons, questions for experts and individual reflection work
- Content that is accessible from any fixed or portable device with an Internet connection

The Postgraduate Diploma analyzes the criteria underlying software quality. Broaden your expertise. Enroll now"

After completing this program, graduates will be able to create and adapt the complete software delivery cycle, according to specific needs, taking into account economic and security considerations"

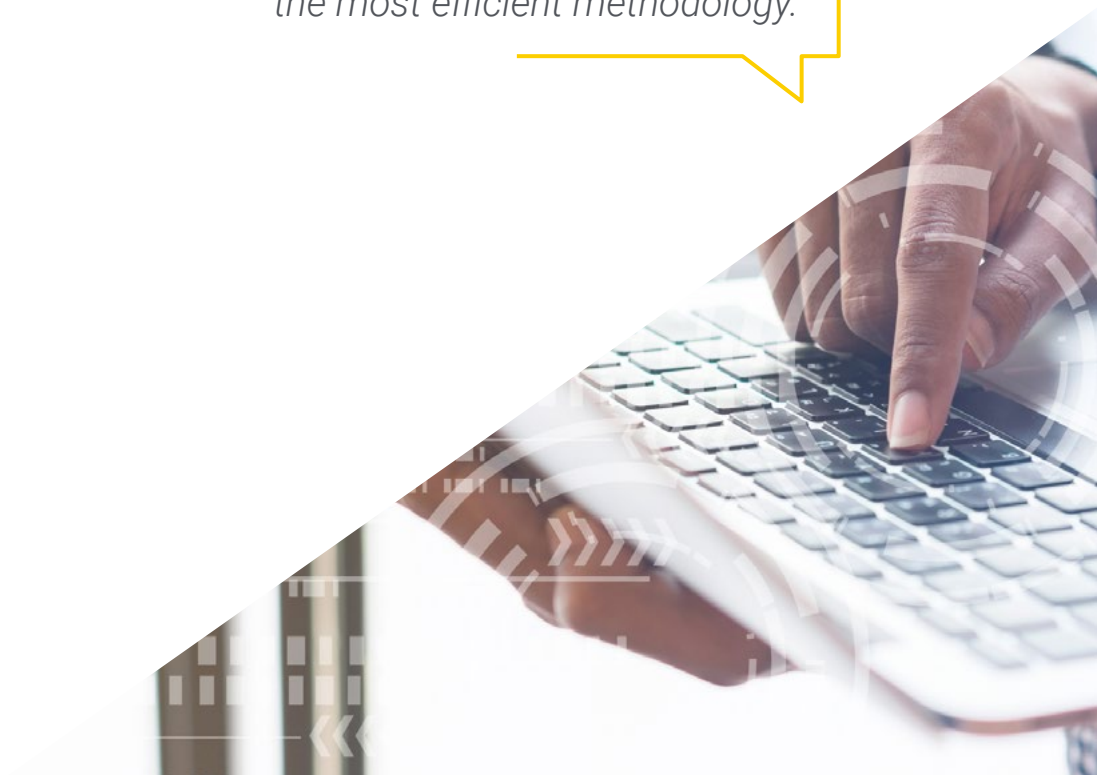
Develop the latest practices and tools in continuous integration and deployment. Being able to apply them selectively in your future projects.

Enroll now and become an expert in 6 months, 100% online and with the most efficient methodology.

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.



02

Objectives

This Postgraduate Diploma has a series of general and specific objectives that guide the achievement of the most important goal, which is for the professional to obtain the knowledge required to efficiently master the software quality development process focused on the design and architecture of scalable systems, databases and continuous integration. Providing a broad and specialized theoretical and practical knowledge to understand the development of projects from an optimized perspective.

Update your level of professionalization is possible with an intelligent study method of flexible and effective learning. Learn about all the advantages of studying at TECH Technological University"

General Objectives

- Develop the criteria, tasks and advanced methodologies to understand the relevance of quality-oriented work
- 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
- Develop Database Standardization
- Provide the student with specialized knowledge to be able to measure and quantify the quality of a software project

At TECH Technological University, you will be able to experience a way of learning that is revolutionizing traditional university study systems around the world"

Specific Objectives

Module 1. DevOps and Continuous Integration. Advanced Practical Solutions in Software Development

- Identify the stages of the software development and delivery cycle adapted to particular cases
- Design a software delivery process using continuous integration
- Build and implement continuous integration and deployment based on your previous design
- Establish automatic quality checkpoints on each Software delivery
- Maintain an automatic and robust software delivery process
- Adapt future needs to the continuous integration and deployment process
- Analyze and anticipate security vulnerabilities during and after the software delivery process

Module 2. Database (DB) Design. Standardization and performance. Software Quality

- 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

Module 3. Scalable Architecture Design Architecture in the Software Life Cycle

- 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

A team of professionals in the field of IT solutions and software development and research will guide the student at all times, in this Postgraduate Diploma focused on Quality in Software Development, to achieve the objectives remotely as it is a purely online program, and following the relearning methodology implemented by TECH. Supported by a safe and comfortable platform, with different interactive means of communication with students privately and in community.

Expert teachers will guide you in your learning process. Implementing a modern study methodology based on relearning and supported by the most secure study platform"

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

Professors

Mr. Tenrero Morán, Marcos

- DevOps Engineer – Allot Communications
- Application Lifecycle Management & DevOps– Meta4 Spain. Cegid
- QA Automation Engineer – Meta4 Spain. Cegid
- Graduated in Computer Engineering from Rey Juan Carlos University
- Development of professional applications for Android - Galileo University (Guatemala)
- Cloud Services Development (nodeJs, JavaScript, HTML5) - UPM
- Continuous Integration with Jenkins – Meta4. Cegid
- Web Development with Angular-CLI (4), Ionic and nodeJS. Meta4 - Rey Juan Carlos University

04

Structure and Content

The contents of this Postgraduate Diploma have been selected by a team of expert teachers in Quality in Software Development, dividing them into 3 study modules. These allow you to go from unit to unit exploring the depths and most important elements within the life cycle process of a software, its architectures, database design, standardization and performance. In addition to studying advanced practical solutions in software development, implementing DevOps and Continuous Integration. Deploying different content formats, both practical and theoretical, through TECH Technological University's modern virtual campus.

With this program, you will be able to develop a sustainable, efficient and quality architecture for the software projects you are presented with"

Module 1. DevOps and Continuous Integration. Advanced Practical Solutions in Software Development

1.1. Software Delivery Flow
- 1.1.1. Identification of Actors and Artifacts
- 1.1.2. Software Delivery Flow Design
- 1.1.3. Software Delivery Flow Inter-Stage Requirements

1.2. Process Automation
- 1.2.1. Continuous Integration
- 1.2.2. Continuous Deployment
- 1.2.3. Environment Configuration and Secret Management

1.3. Declarative Pipelines
- 1.3.1. Differences Between Traditional, Code-Like and Declarative Pipelines
- 1.3.2. Declarative Pipelines
- 1.3.3. Declarative Pipelines in Jenkins
- 1.3.4. Comparison of Continuous Integration Providers

1.4. Quality Gates and Enriched Feedback
- 1.4.1. Quality Gates
- 1.4.2. Quality Standards with Quality Gates. Maintenance
- 1.4.3. Business Requirements in Integration Requests

1.5. Artifact Management
- 1.5.1. Artifacts and Life Cycle
- 1.5.2. Artifact Storage and Management Systems
- 1.5.3. Security in Artifact Management

1.6. Continuous Deployment
- 1.6.1. Continuous Deployment as Containers
- 1.6.2. Continuous Deployment with PaaS
- 1.6.3. Continuous Deployment of Mobile Applications

1.7. Improving Pipeline Runtime: Static Analysis and Git Hooks
- 1.7.1. Static Analysis
- 1.7.2. Code Style Rules
- 1.7.3. Git Hooks and Unit Tests
- 1.7.4. The Impact of Infrastructure

1.8. Vulnerabilities in Containers
- 1.8.1. Vulnerabilities in Containers
- 1.8.2. Image Scanning
- 1.8.3. Periodic Reports and Alerts

Module 2. Database (DB) Design. Standardization and performance. Software Quality

2.1. Database Design
- 2.1.1. Databases. Typology
- 2.1.2. Databases Currently Used
  - 2.1.2.1. Relationship
  - 2.1.2.2. Key-Value
  - 2.1.2.3. Based on Graphs
- 2.1.3. Data Quality

2.2. Entity-Relationship Model Design (I)
- 2.2.1. Entity-Relationship Model. Quality and Documentation
- 2.2.2. Entities
  - 2.2.2.1. Strong Entity
  - 2.2.2.2. Weak Entity
- 2.2.3. Attributes
- 2.2.4. Set of Relationships
  - 2.2.4.1. 1 to 1
  - 2.2.4.2. 1 to Many
  - 2.2.4.3. Many to 1
  - 2.2.4.4. Many to Many
- 2.2.5. Keys
  - 2.2.5.1. Primary Key
  - 2.2.5.2. Foreign Key
  - 2.2.5.3. Weak Entity Primary Key
- 2.2.6. Restrictions
- 2.2.7. Cardinality
- 2.2.8. Heritage
- 2.2.9. Aggregation

2.3. Entity-Relationship Model (II). Tools
- 2.3.1. Entity-Relationship Model. Tools
- 2.3.2. Entity-Relationship Model. Practical Example
- 2.3.3. Feasible Entity-Relationship Model
  - 2.3.3.1. Visual Sample
  - 2.3.3.2. Sample in Table Representation

2.4. Database (DB) Standardization (I). Software Quality Considerations
- 2.4.1. DB Standardization and Quality
- 2.4.2. Dependency
  - 2.4.2.1. Functional Dependence
  - 2.4.2.2. Properties of Functional Dependence
  - 2.4.2.3. Deduced Properties
- 2.4.3. Keys

2.5. Database (DB) Normalization (II). Normal Forms and Codd Rules
- 2.5.1. Normal Shapes
  - 2.5.1.1. First Normal Form (1FN)
  - 2.5.1.2. Second Normal Form (2FN)
  - 2.5.1.3. Third Normal Form (3FN)
  - 2.5.1.4. Boyce-Codd Normal Form (BCNF)
  - 2.5.1.5. Fourth Normal Form (4FN)
  - 2.5.1.6. Fifth Normal Form (5FN)
- 2.5.2. Codd's Rules
  - 2.5.2.1. Rule 1: Information
  - 2.5.2.2. Rule 2: Guaranteed Access
  - 2.5.2.3. Rule 3: Systematic Treatment of Null Values
  - 2.5.2.4. Rule 4: Description of the Database
  - 2.5.2.5. Rule 5: Integral Sub-Language
  - 2.5.2.6. Rule 6: View Update
  - 2.5.2.7. Rule 7: Insert and Update
  - 2.5.2.8. Rule 2. Physical Independence
  - 2.5.2.9. Rule 9: Logical Independence
  - 2.5.2.10. Rule 10: Integrity Independence
    - 2.5.2.10.1. Integrity Rules
  - 2.5.2.11. Rule 11: Distribution
  - 2.5.2.12. Rule 12: Non-Subversion
- 2.5.3. Practical Example

2.6. Data Warehouse/OLAP System
- 2.6.1. Data Warehouse
- 2.6.2. Fact Table
- 2.6.3. Dimension Table
- 2.6.4. Creation of the OLAP System. Tools

2.7. Database (DB) Performance
- 2.7.1. Index Optimization
- 2.7.2. Query Optimization
- 2.7.3. Table Partitioning

2.8. Simulation of Real Project for DB Design (I)
- 2.8.1. Project Overview (Company A)
- 2.8.2. Application of Database Design
- 2.8.3. Proposed Exercises
- 2.8.4. Proposed Exercises Feedback

2.9. Simulation of Real Project for BD Design (II)
- 2.9.1. Project Overview (Company B)
- 2.9.2. Application of Database Design
- 2.9.3. Proposed Exercises
- 2.9.4. Proposed Exercises Feedback

2.10. Relevance of DB Optimization to Software Quality
- 2.10.1. Design Optimization
- 2.10.2. Query Code Optimization
- 2.10.3. Stored Procedure Code Optimization
- 2.10.4. Influence of Triggers on Software Quality. Reccomendations for Use

Module 3. Scalable Architecture Design Architecture in the Software Life Cycle

3.1. Design of Scalable Architectures (I)
- 3.1.1. Scalable Architectures
- 3.1.2. Principles of a Scalable Architecture
  - 3.1.2.1. Reliable
  - 3.1.2.2. Scalable
  - 3.1.2.3. Maintainable
- 3.1.3. Types of Scalability
  - 3.1.3.1. Vertical
  - 3.1.3.2. Horizontal
  - 3.1.3.3. Combined

3.2. Architecture DDD (Domain-Driven Design)
- 3.2.1. The DDD Model Domain Orientation
- 3.2.2. Layers, Distribution of Responsibility and Design Patterns
- 3.2.3. Decoupling as a Basis for Quality

3.3. Design of Scalable Architectures (II). Benefits, Limitations and Design Strategies
- 3.3.1. Scalable Architecture. Benefits
- 3.3.2. Scalable Architecture. Limitations
- 3.3.3. Strategies for the Development of Scalable Architectures (Descriptive Table)

3.4. Software Life Cycle (I). Stages
- 3.4.1. Software Life Cycle
  - 3.4.1.1. Planning Stage
  - 3.4.1.2. Analysis Stage
  - 3.4.1.3. Design Stage
  - 3.4.1.4. Implementation Stage
  - 3.4.1.5. Testing Stage
  - 3.4.1.6. Installation/Deployment Stage
  - 3.4.1.7. Use and Maintenance Stage

3.5. Software Life Cycle Models
- 3.5.1. Waterfall Model
- 3.5.2. Repetitive Model
- 3.5.3. Spiral Model
- 3.5.4. Big Bang Model

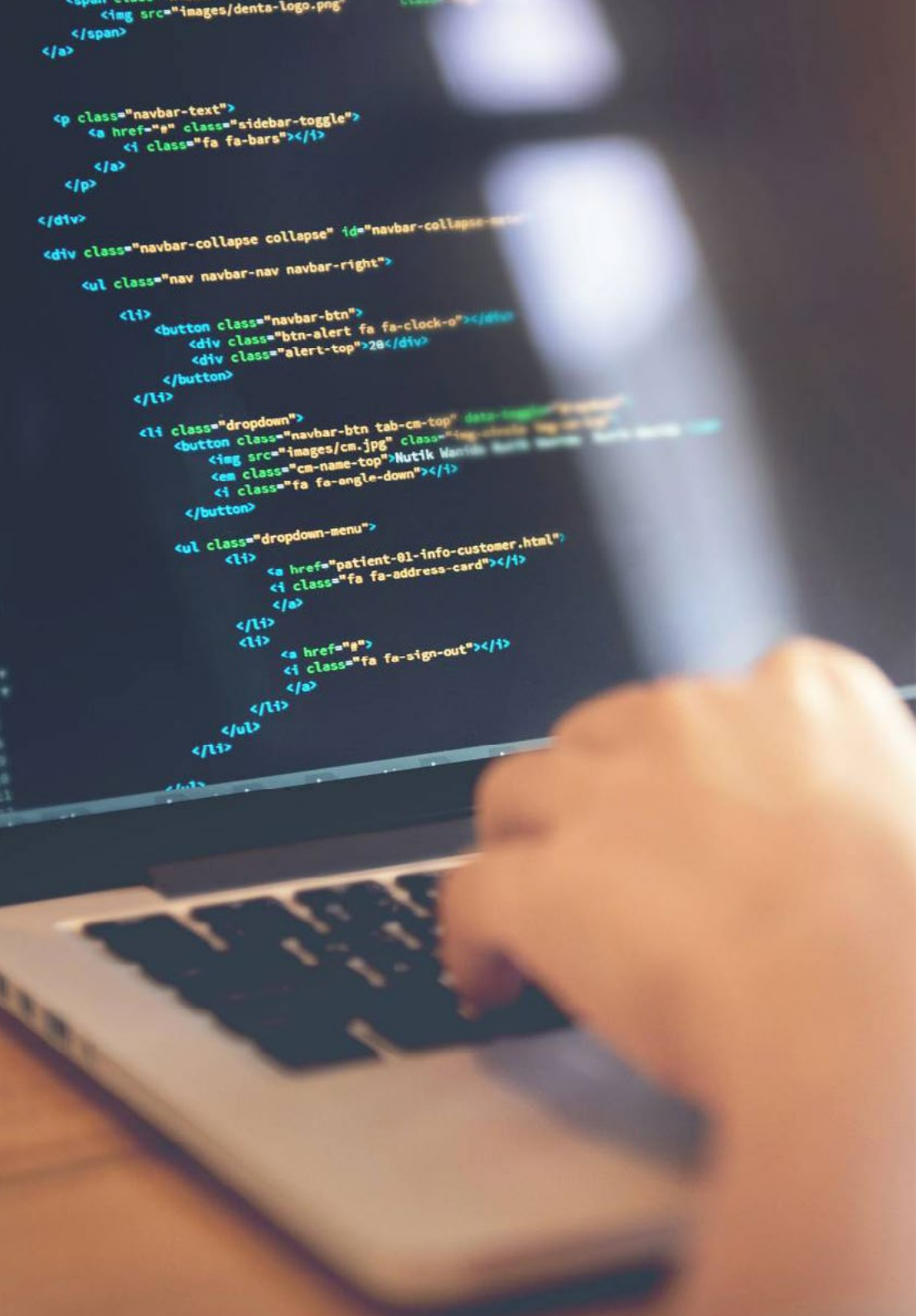
3.6. Software Life Cycle (II). Automation
- 3.6.1. Software Development Life Cycle. Solutions
  - 3.6.1.1. Continuous Integration and Development (CI/CD)
  - 3.6.1.2. Agile Methodologies
  - 3.6.1.3. DevOps/Production Operations
- 3.6.2. Future Trends
- 3.6.3. Practical Examples

3.7. Software Architecture in the Software Life Cycle
- 3.7.1. Benefits
- 3.7.2. Limitations
- 3.7.3. Tools

3.8. Real Project Simulation for Software Architecture Design (I)
- 3.8.1. Project Overview (Company A)
- 3.8.2. Software Architecture Design Application
- 3.8.3. Proposed Exercises
- 3.8.4. Proposed Exercises Feedback

3.9. Simulation of a Real Project for Software Architecture Design (II)
- 3.9.1. Project Overview (Company B)
- 3.9.2. Software Architecture Design Application
- 3.9.3. Proposed Exercises
- 3.9.4. Proposed Exercises Feedback

3.10. Simulation of a Real Project for Software Architecture Design (III)
- 3.10.1. General Description of the Project (Company C)
- 3.10.2. Software Architecture Design Application
- 3.10.3. Proposed Exercises
- 3.10.4. Proposed Exercises Feedback



Enroll in this program now and get the most up-to-date knowledge on Quality in Software Development. Graduating as an expert in just 6 months"

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 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

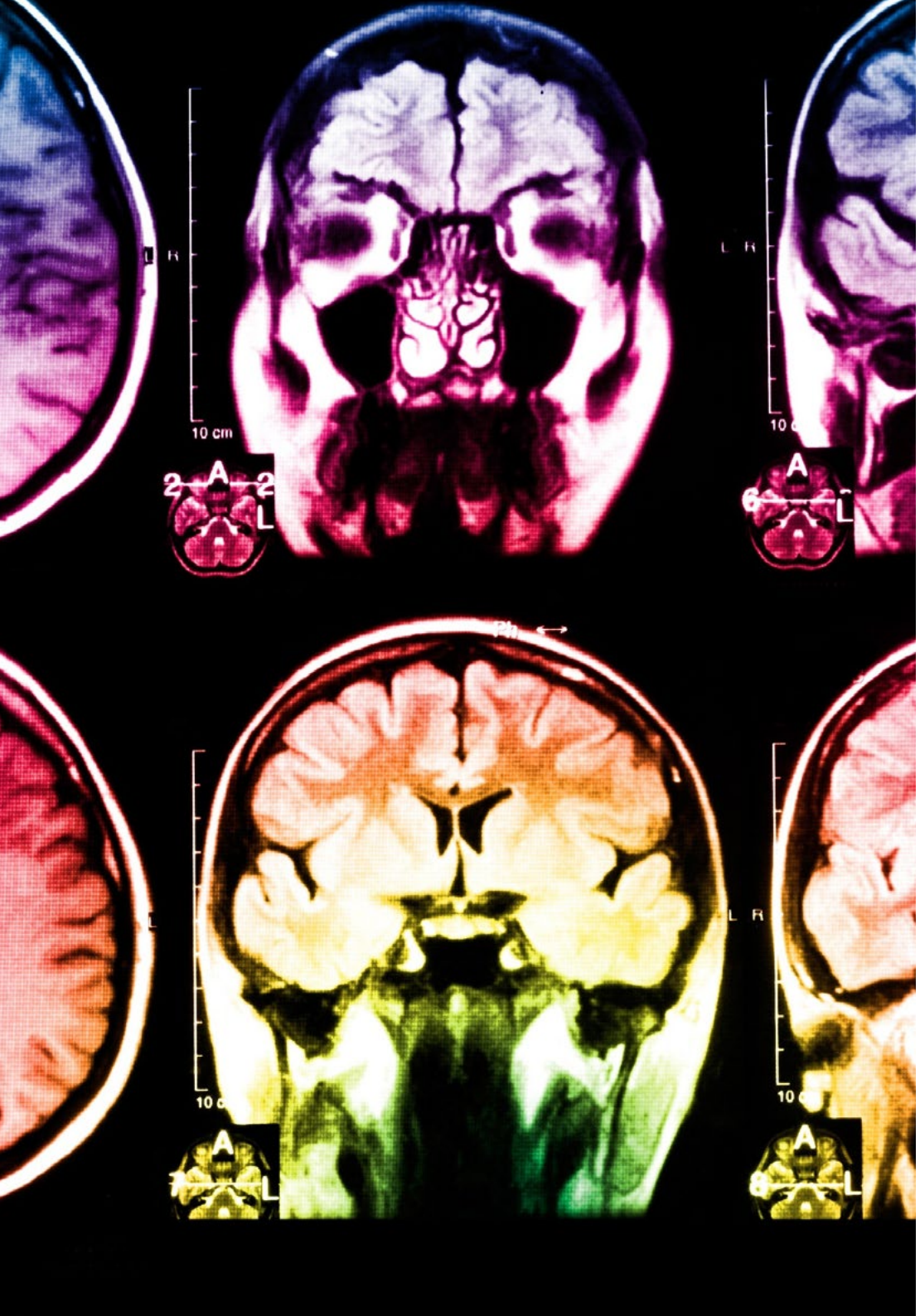
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

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.

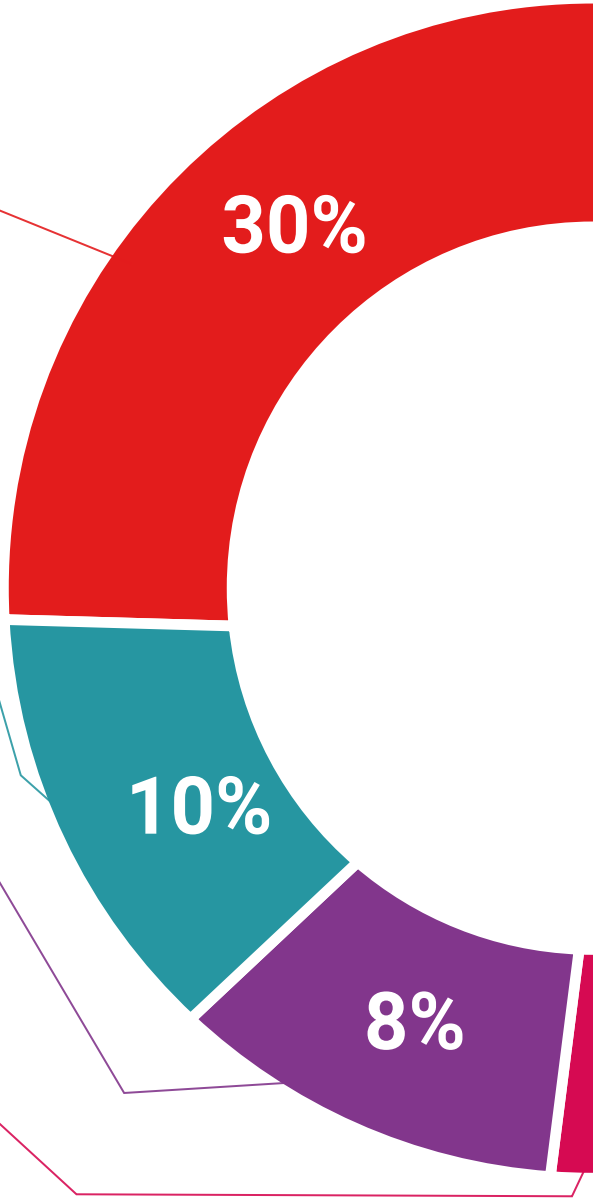
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

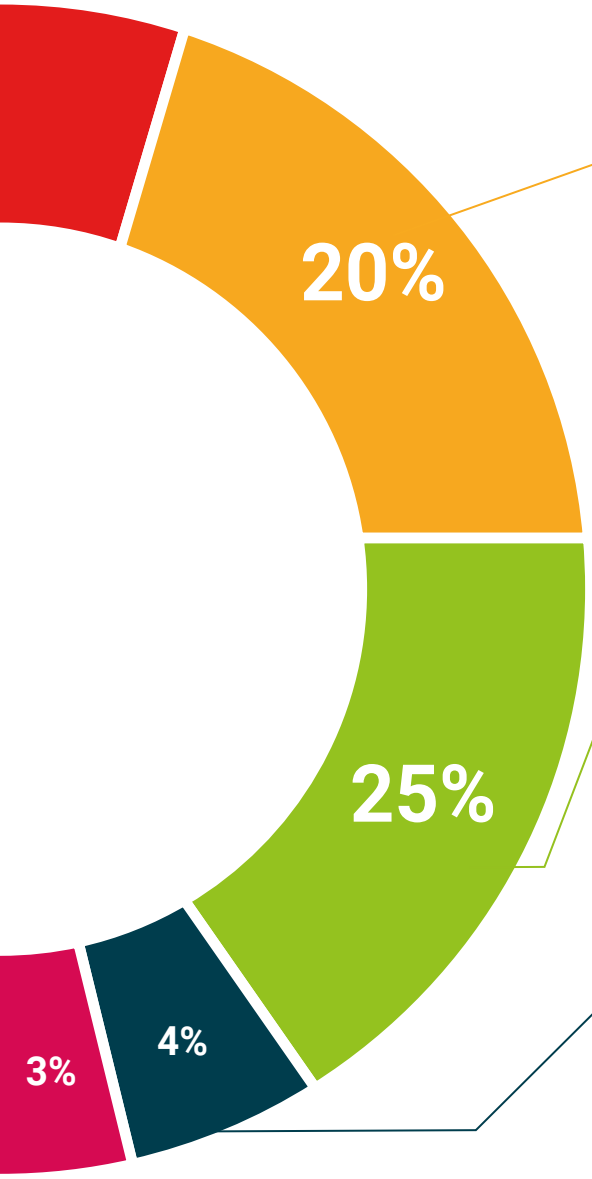
Practising Skills and Abilities

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 Diploma in Quality in Software Development guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma issued by TECH Technological University.

Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork"

This **Postgraduate Diploma in Quality in Software Development** 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 certificate 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 Quality in Software Development**

Official Nº of Hours: **450 h.**


tech technological university

Awards the following

CERTIFICATE

to

Mr./Ms. _____, with identification number _____.

For having passed and accredited the following program

POSTGRADUATE DIPLOMA

in

Quality in Software Development

This is a qualification awarded by this University, equivalent to 450 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018.

June 17, 2020

Tere Guevara Navarro

Dean

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country. Unique TECH Code: AFWORD23S techtitute.com/certificates

*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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