

# Postgraduate Certificate

## Industrial Safety Methodology and Tools



## Postgraduate Certificate Industrial Safety Methodology and Tools

- » Modality: online
- » Duration: 6 weeks
- » Certificate: TECH Global University
- » Accreditation: 6 ECTS
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtitude.com/us/engineering/postgraduate-certificate/industrial-safety-methodology-tools](http://www.techtitude.com/us/engineering/postgraduate-certificate/industrial-safety-methodology-tools)

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01

# Introduction to the Program

The current Industrial Safety landscape is marked by several factors that make it increasingly complex and, at the same time, essential for organizations. In this sense, companies must face risks arising from possible accidents, human error or technological failures. This requires integrated safety management covering all phases of the life cycle of industrial projects: from design to operation and maintenance. For this reason, TECH presents a 100% online program that prepares professionals to face the current challenges of Industrial Safety and provide innovative solutions to the most complex problems of the sector. All this, taught with the most innovative teaching methodology: Relearning.





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*With the 100% online methodology of this Postgraduate Certificate, you will master the methodologies and tools necessary to optimize Industrial Safety in various industries”*

Industrial Safety is an essential discipline for the protection of people, the environment and the assets of organizations within industrial sectors. Its main objective is to identify, evaluate and mitigate the risks associated with the operation of facilities and processes involving hazardous materials, highly complex equipment, and working conditions that may endanger the safety of employees and facilities. Proper management of these risks not only prevents accidents and damages, but also optimizes resources, reduces operating costs and contributes to compliance with international regulations.

In this context, TECH presents this 100% online Postgraduate Certificate, a program designed to provide a comprehensive preparation in the main methodologies and tools for industrial risk management. Throughout this program, engineers will learn to apply Quantitative Risk Analysis (QRA), Root Cause Analysis (RCA), HAZOP, HAZID, DFMEA and Quantitative Risk Assessment, among others, in order to identify, analyze and mitigate hazards in sectors such as energy, manufacturing and petrochemicals. In addition, they will delve into the use of international standards such as IEC 61511 and the ALARP Criteria, providing a solid theoretical and practical basis for improving safety and operational efficiency in various industries.

In addition, this postgraduate course is based on the Relearning method, of which TECH is a pioneer. This pedagogical system guarantees the exhaustive assimilation of complex concepts in a progressive, autonomous and natural way. Therefore, the only thing professionals will need is a device with Internet access to immerse themselves in the Virtual Campus. There you will find a wide range of multimedia support resources to enhance your academic experience, including explanatory videos, specialized readings based on the latest trends and interactive summaries.

This **Postgraduate Certificate in Industrial Safety Methodology and Tools** contains the most complete and up-to-date program on the market. The most important features include:

- ♦ The development of case studies presented by highly qualified experts a deep mastery of industrial safety, risk management and international regulations
- ♦ The graphic, schematic and eminently practical content of the book provides scientific and practical information on those disciplines that are essential for professional practice
- ♦ Practical exercises where the process of self-assessment can be used to improve learning
- ♦ Its 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



*You will acquire a comprehensive and practical vision to lead projects that transform safety and operational efficiency in the most demanding companies in the sector"*

“

*You will have the necessary knowledge to implement and manage Industrial Safety methodologies at a global level, ensuring compliance with local and international regulations”*

The program's teaching staff includes professionals from the field who contribute their work experience to this educational 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 education 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 during the course. For this purpose, students will be assisted by an innovative interactive video system created by renowned experts.

*You will use the Relearning methodology, of which TECH is a pioneer, designed to ensure the natural and progressive assimilation of complex concepts.*

*You will acquire the ability to perform risk assessments and apply effective solutions in real time.*



02

# Why Study at TECH?

TECH is the world's largest online university. With an impressive catalog of more than 14,000 university programs, available in 11 languages, it is positioned as a leader in employability, with a 99% job placement rate. In addition, it has a huge faculty of more than 6,000 professors of the highest international prestige.



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*Study at the largest online university in the world and ensure your professional success. The future begins at TECH”*

**The world's best online university, according to FORBES**

The prestigious Forbes magazine, specialized in business and finance, has highlighted TECH as "the best online university in the world" This is what they have recently stated in an article in their digital edition in which they echo the success story of this institution, "thanks to the academic offer it provides, the selection of its teaching staff, and an innovative learning method oriented to form the professionals of the future".

**Forbes**

The best online university in the world

The most complete  
**syllabus**

**The most complete syllabuses on the university scene**

TECH offers the most complete syllabuses on the university scene, with programs that cover fundamental concepts and, at the same time, the main scientific advances in their specific scientific areas. In addition, these programs are continuously updated to guarantee students the academic vanguard and the most demanded professional skills. and the most in-demand professional competencies. In this way, the university's qualifications provide its graduates with a significant advantage to propel their careers to success.

**The best top international faculty**

TECH's faculty is made up of more than 6,000 professors of the highest international prestige. Professors, researchers and top executives of multinational companies, including Isaiah Covington, performance coach of the Boston Celtics; Magda Romanska, principal investigator at Harvard MetaLAB; Ignacio Wistumba, chairman of the department of translational molecular pathology at MD Anderson Cancer Center; and D.W. Pine, creative director of TIME magazine, among others.

**TOP**  
international faculty



The most effective methodology

**A unique learning method**

TECH is the first university to use Relearning in all its programs. This is the best online learning methodology, accredited with international teaching quality certifications, provided by prestigious educational agencies. In addition, this innovative academic model is complemented by the "Case Method", thereby configuring a unique online teaching strategy. Innovative teaching resources are also implemented, including detailed videos, infographics and interactive summaries.

**The world's largest online university**

TECH is the world's largest online university. We are the largest educational institution, with the best and widest digital educational catalog, one hundred percent online and covering most areas of knowledge. We offer the largest selection of our own degrees and accredited online undergraduate and postgraduate degrees. In total, more than 14,000 university programs, in ten different languages, making us the largest educational institution in the world.

**World's No.1**  
The World's largest online university

#### The official online university of the NBA

TECH is the official online university of the NBA. Thanks to our agreement with the biggest league in basketball, we offer our students exclusive university programs, as well as a wide variety of educational resources focused on the business of the league and other areas of the sports industry. Each program is made up of a uniquely designed syllabus and features exceptional guest hosts: professionals with a distinguished sports background who will offer their expertise on the most relevant topics.

#### Leaders in employability

TECH has become the leading university in employability. Ninety-nine percent of its students obtain jobs in the academic field they have studied within one year of completing any of the university's programs. A similar number achieve immediate career enhancement. All this thanks to a study methodology that bases its effectiveness on the acquisition of practical skills, which are absolutely necessary for professional development.



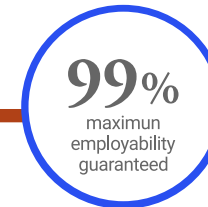
#### Google Premier Partner

The American technology giant has awarded TECH the Google Premier Partner badge. This award, which is only available to 3% of the world's companies, highlights the efficient, flexible and tailored experience that this university provides to students. The recognition not only accredits the maximum rigor, performance and investment in TECH's digital infrastructures, but also places this university as one of the world's leading technology companies.



#### The top-rated university by its students

Students have positioned TECH as the world's top-rated university on the main review websites, with a highest rating of 4.9 out of 5, obtained from more than 1,000 reviews. These results consolidate TECH as the benchmark university institution at an international level, reflecting the excellence and positive impact of its educational model.



# 03 Syllabus

The syllabus of this Postgraduate Certificate offers a complete overview of the main methodologies for the identification, assessment and mitigation of industrial risks. Throughout the program, key tools such as Quantitative Risk Analysis, Root Cause Analysis and HAZOP and HAZID studies will be addressed, with a practical approach in various industrial sectors. This comprehensive perspective prepares engineers to address safety challenges in industry, applying advanced assessment and management criteria that optimize both safety and operational efficiency.





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*You will become an expert in one of the most demanding fields of engineering and industrial management in just 180 hours of theoretical-practical content”*

## Module 1. Industrial Safety Methodologies and Tools

- 1.1. Quantitative Risk Analysis (QRA)
  - 1.1.1. QRA Approach: Quantitative Risk Analysis in Industrial Safety
  - 1.1.2. Probabilistic Methods for Risk Estimation: Statistical Analysis and Numerical Risk Assessment
  - 1.1.3. QRA: Examples in the Process and Manufacturing Industry. Case Studies
- 1.2. Root Cause Analysis
  - 1.2.1. Root Cause Analysis. Objectives in Industrial Safety
  - 1.2.2. Methodologies for RCA
  - 1.2.3. Practical Application of RCA. Identification of Underlying Causes and Corrective Actions
- 1.3. Hazard and Operability Study (HAZOP)
  - 1.3.1. HAZOP: Objectives and Application
  - 1.3.2. Steps in HAZOP: Identification of Deviations and Risk Assessment
  - 1.3.3. Practical Examples of HAZOP: Application in Chemical and Industrial Processes
- 1.4. Hazard Identification (HAZID)
  - 1.4.1. HAZID: Purpose in Hazard Identification
  - 1.4.2. Differences between HAZOP and HAZID. Uses
  - 1.4.3. Steps in HAZID: Early Hazard Identification and Prevention
- 1.5. Design Failure Mode and Effect Analysis (DFMEA)
  - 1.5.1. DFMEA: Purpose and Approach to Design Safety
  - 1.5.2. Procedure in DFMEA: Identification of Failure Modes and Their Impact
  - 1.5.3. Examples in Industrial Design. Application of DFMEA in the Automotive, Manufacturing and Process Industries
- 1.6. Quantitative Risk Assessment and Risk Matrix
  - 1.6.1. Risk Matrix
  - 1.6.2. Calculation of Probability and Severity
    - 1.6.2.1. Methodologies to Estimate and Evaluate Risks
  - 1.6.3. Practical Use of the Risk Matrix
    - 1.6.3.1. Examples in Sectors such as Construction and Energy





- 1.7. ALARP (As Low As Reasonably Practicable) Criteria
  - 1.7.1. ALARP Criteria
    - 1.7.1.1. Application of the ALARP Criteria in Risk Management
  - 1.7.2. Cost-Benefit Assessment of Safety Measures
    - 1.7.2.1. Risk Reduction Decisions
  - 1.7.3. Implementing the ALARP Criteria
    - 1.7.3.1. Examples from Different Industries
- 1.8. IEC 61511 Standard. Functional Safety for the Process Industry
  - 1.8.1. IEC 61511 Standard
    - 1.8.1.1. Functional Safety as Applied to Safety Instrumented Systems
  - 1.8.2. Safety Life Cycle
    - 1.8.2.1. Planning, Design, Operation and Maintenance according to IEC 61511
  - 1.8.3. IEC 61511 Implementation Examples
    - 1.8.3.1. Safety Cases in Chemical and Petrochemical Plants
- 1.9. Risk Assessment with Bow-Tie Analysis
  - 1.9.1. Bow-Tie Analysis. Visual Tool for Risk Assessment
  - 1.9.2. Key Components of Bow-Tie Analysis
    - 1.9.2.1. Identification of Preventive and Mitigation Barriers
  - 1.9.3. Example of the Bow-Tie Method. Cases in Industrial Risk Management
- 1.10. Risk-Based Safety Evaluation Methods (RBSE)
  - 1.10.1. Risk-Based Safety
    - 1.10.1.1. Prioritization of Safety Resources by Risk
  - 1.10.2. Risk-Based Assessment Techniques: Qualitative and Quantitative Assessments
  - 1.10.3. Implementation in Industry: Application in Sectors such as Energy, Transportation and Manufacturing

04

# Teaching Objectives

The main objective of this TECH Postgraduate Certificate is to train professionals to apply advanced approaches to industrial risk management, developing skills in the identification and analysis of complex hazards. In this way, engineers will master specialized tools and methodologies to assess risks, implement effective mitigation strategies and make informed decisions that promote a culture of safety in their work environment. In addition, they will strengthen their ability to work with international regulations, optimizing risk management in a comprehensive and sustainable manner in various industrial sectors.



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*This TECH program will equip you with the knowledge and skills necessary to meet today's challenges in Industrial Safety”*



## General Objectives

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- ♦ Incorporate methodologies and tools specific to industrial safety management
- ♦ Identify reactive and proactive analysis tools for industrial safety management
- ♦ Determine the main standards that support the methodologies associated with industrial safety management
- ♦ Consolidate an objective and professional approach to risk assessment and management





### Specific Objectives

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- ♦ Incorporate specific methodologies to identify and quantify risks
- ♦ Use preventive tools such as DFMEA
- ♦ Consolidate the concept of root cause, master the different methodologies for its identification
- ♦ Incorporate the concepts of HAZID and HAZOP, differentiate them and understand their benefits in the industry
- ♦ Consolidate the concept of functional safety and the central aspects of the IEC 61511 standard
- ♦ Consolidate the use of statistical tools to support safety management in industry



*You will acquire practical skills that will enable you to identify, assess and mitigate risks in critical industrial processes, improving safety and operational efficiency”*

05

# Study Methodology

TECH is the world's first university to combine the **case study** methodology with **Relearning**, a 100% online learning system based on guided repetition.

This disruptive pedagogical strategy has been conceived to offer professionals the opportunity to update their knowledge and develop their skills in an intensive and rigorous way. A learning model that places students at the center of the educational process giving them the leading role, adapting to their needs and leaving aside more conventional methodologies.



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*TECH will prepare you to face new challenges in uncertain environments and achieve success in your career”*

## The student: the priority of all TECH programs

In TECH's study methodology, the student is the main protagonist.

The teaching tools of each program have been selected taking into account the demands of time, availability and academic rigor that, today, not only students demand but also the most competitive positions in the market.

With TECH's asynchronous educational model, it is students who choose the time they dedicate to study, how they decide to establish their routines, and all this from the comfort of the electronic device of their choice. The student will not have to participate in live classes, which in many cases they will not be able to attend. The learning activities will be done when it is convenient for them. They can always decide when and from where they want to study.

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*At TECH you will NOT have live classes  
(which you might not be able to attend)”*



### The most comprehensive study plans at the international level

TECH is distinguished by offering the most complete academic itineraries on the university scene. This comprehensiveness is achieved through the creation of syllabi that not only cover the essential knowledge, but also the most recent innovations in each area.

By being constantly up to date, these programs allow students to keep up with market changes and acquire the skills most valued by employers. In this way, those who complete their studies at TECH receive a comprehensive education that provides them with a notable competitive advantage to further their careers.

And what's more, they will be able to do so from any device, pc, tablet or smartphone.

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*TECH's model is asynchronous, so it allows you to study with your pc, tablet or your smartphone wherever you want, whenever you want and for as long as you want”*

## Case Studies and Case Method

The case method has been the learning system most used by the world's best business schools. Developed in 1912 so that law students would not only learn the law based on theoretical content, its function was also to present them with real complex situations. In this way, they could make informed decisions and value judgments about how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

With this teaching model, it is students themselves who build their professional competence through strategies such as Learning by Doing or Design Thinking, used by other renowned institutions such as Yale or Stanford.

This action-oriented method will be applied throughout the entire academic itinerary that the student undertakes with TECH. Students will be confronted with multiple real-life situations and will have to integrate knowledge, research, discuss and defend their ideas and decisions. All this with the premise of answering the question of how they would act when facing specific events of complexity in their daily work.



## Relearning Methodology

At TECH, case studies are enhanced with the best 100% online teaching method: Relearning.

This method breaks with traditional teaching techniques to put the student at the center of the equation, providing the best content in different formats. In this way, it manages to review and reiterate the key concepts of each subject and learn to apply them in a real context.

In the same line, and according to multiple scientific researches, reiteration is the best way to learn. For this reason, TECH offers between 8 and 16 repetitions of each key concept within the same lesson, presented in a different way, with the objective of ensuring that the knowledge is completely consolidated during the study process.

*Relearning will allow you to learn with less effort and better performance, involving you more in your specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to success.*



## A 100% online Virtual Campus with the best teaching resources

In order to apply its methodology effectively, TECH focuses on providing graduates with teaching materials in different formats: texts, interactive videos, illustrations and knowledge maps, among others. All of them are designed by qualified teachers who focus their work on combining real cases with the resolution of complex situations through simulation, the study of contexts applied to each professional career and learning based on repetition, through audios, presentations, animations, images, etc.

The latest scientific evidence in the field of Neuroscience points to the importance of taking into account the place and context where the content is accessed before starting a new learning process. Being able to adjust these variables in a personalized way helps people to remember and store knowledge in the hippocampus to retain it in the long term. This is a model called Neurocognitive context-dependent e-learning that is consciously applied in this university qualification.

In order to facilitate tutor-student contact as much as possible, you will have a wide range of communication possibilities, both in real time and delayed (internal messaging, telephone answering service, email contact with the technical secretary, chat and videoconferences).

Likewise, this very complete Virtual Campus will allow TECH students to organize their study schedules according to their personal availability or work obligations. In this way, they will have global control of the academic content and teaching tools, based on their fast-paced professional update.



*The online study mode of this program will allow you to organize your time and learning pace, adapting it to your schedule"*

### The effectiveness of the method is justified by four fundamental achievements:

1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that assess real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.

### The university methodology top-rated by its students

The results of this innovative teaching model can be seen in the overall satisfaction levels of TECH graduates.

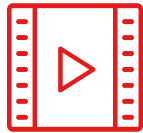
The students' assessment of the teaching quality, the quality of the materials, the structure of the program and its objectives is excellent. Not surprisingly, the institution became the top-rated university by its students according to the global score index, obtaining a 4.9 out of 5.

*Access the study contents from any device with an Internet connection (computer, tablet, smartphone) thanks to the fact that TECH is at the forefront of technology and teaching.*

*You will be able to learn with the advantages that come with having access to simulated learning environments and the learning by observation approach, that is, Learning from an expert.*



As such, the best educational materials, thoroughly prepared, will be available in this program:



#### 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.

This content is then adapted in an audiovisual format that will create our way of working online, with the latest techniques that allow us to offer you high quality in all of the material that we provide you with.



#### Practicing Skills and Abilities

You will carry out activities to develop specific competencies and skills in each thematic field. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop within the framework of the globalization we live in.



#### Interactive Summaries

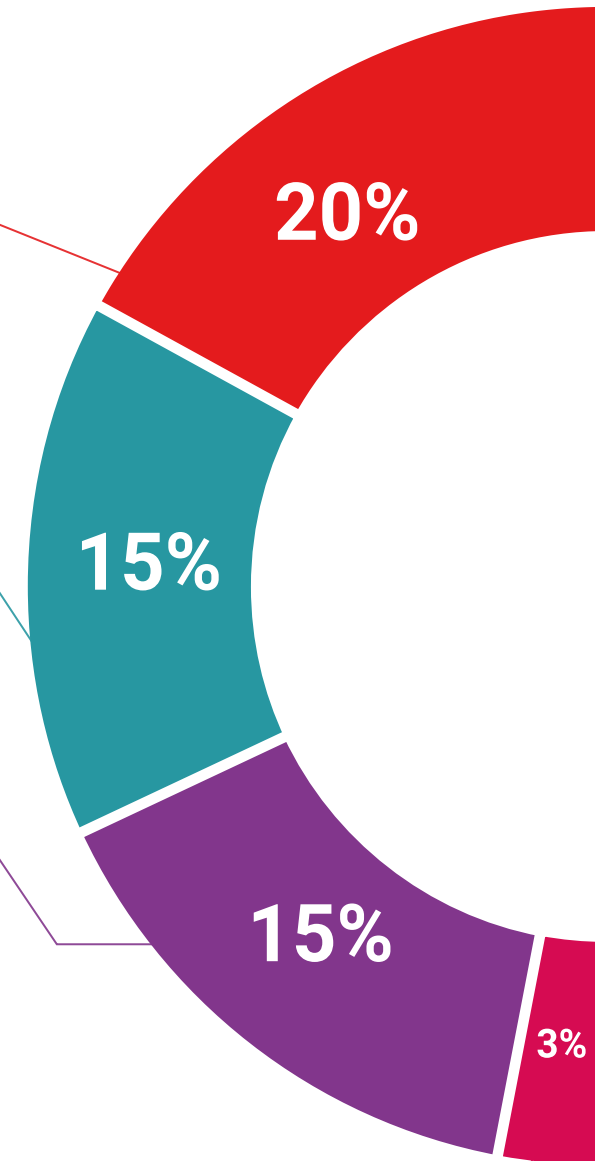
We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

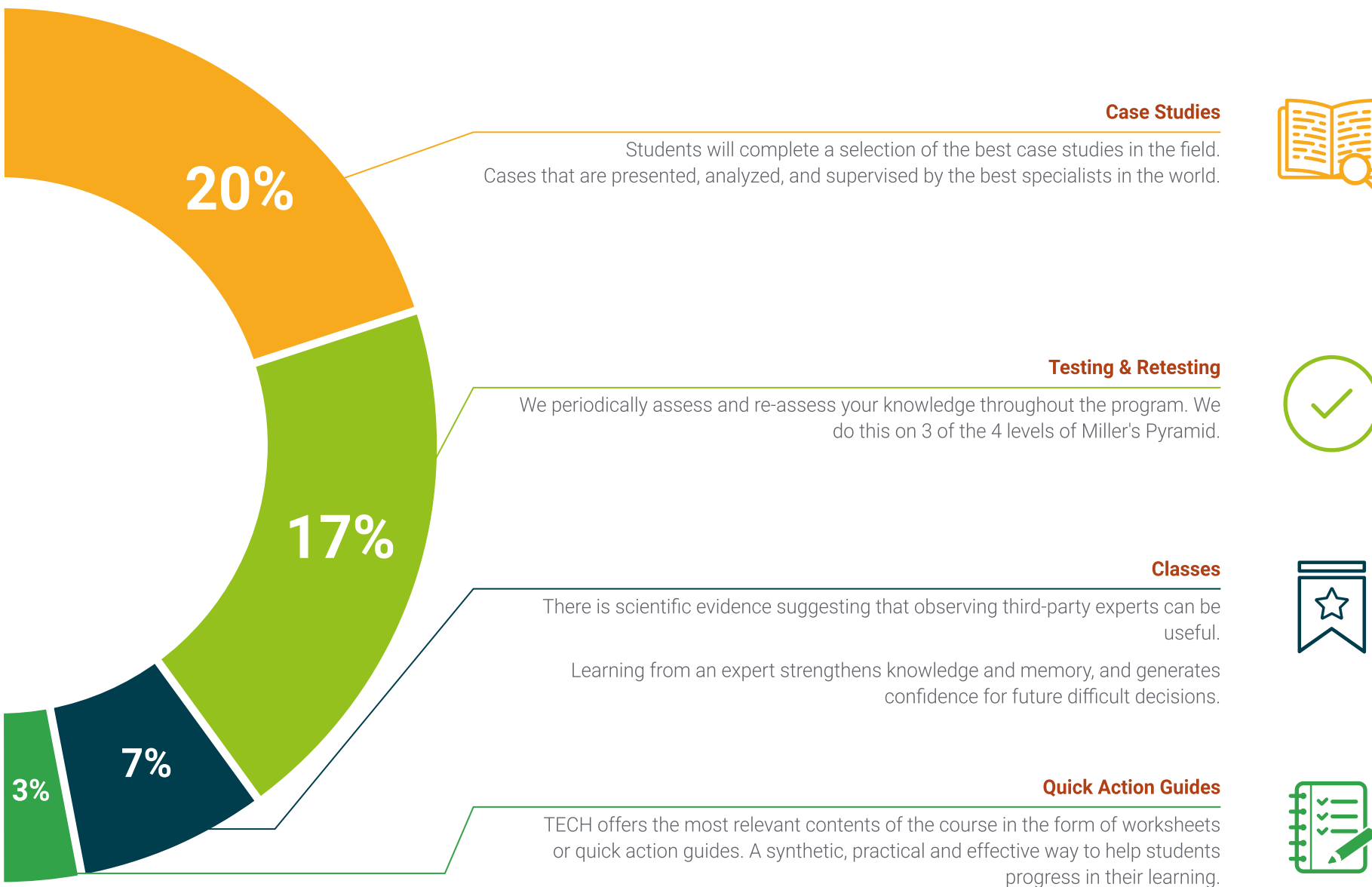
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



#### Additional Reading

Recent articles, consensus documents, international guides... In our virtual library you will have access to everything you need to complete your education.





06

# Teaching Staff

This Postgraduate Certificate has a highly specialized teaching staff, composed of professionals with extensive experience in the field of Industrial Safety and Risk Management. Its pedagogical approach is based on the real application of the most relevant Methodologies and Tools in this field, allowing graduates to acquire skills that will enable them to lead safety projects in highly complex industrial environments.





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*You will learn from experts with decades of experience in the industry, who will not only master the methodologies, but will also share innovative approaches to address the challenges of Industrial Safety”*

## Management



### Mr. Rettori Canali, Ignacio Esteban

- ♦ Product Safety Engineer at GE Vernova
- ♦ Sustainability Consultant at ALG-INDRA
- ♦ Product Safety Engineer at Alten
- ♦ HSE Data Analyst at MARS
- ♦ Logistics Shift Manager at Repsol YPF
- ♦ Environmental Analyst at Repsol YPF
- ♦ Environmental Specialist at the National Ministry of Environment
- ♦ Specialist in Energy Economics at the Polytechnic University of Catalonia
- ♦ Specialist in Renewable Energies and Electric Mobility, Polytechnic University of Catalonia
- ♦ Specialist in Energy Management from the National Technological University
- ♦ Specialist in Project Management, Liberty Foundation
- ♦ Specialist in Safety and Environment from the Catholic University of Argentina
- ♦ Degree in Environmental Engineering from the National University of Litoral



## Professors

### Mr. Castillo Raineri, Néstor Ariel

- ♦ Environmental Safety Engineer specialized in Hygiene and Safety at Work
- ♦ Coordinator at CILP Química/Refinery
- ♦ Plant shutdown safety supervisor in the Maintenance area at CILP Química/Refinery
- ♦ Degree in Environmental Safety Engineering from the University of the Merchant Marine
- ♦ Degree in Occupational Health and Safety from the University of Moron
- ♦ Certification in Environmental Management



*All teachers in this program have extensive experience, offering you an innovative perspective on the main advances in this field of study"*

07

# Certificate

The Postgraduate Certificate in Industrial Safety Methodology and Tools guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.



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

This private qualification will allow you to obtain a diploma for the **Postgraduate Certificate in Industrial Safety Methodology and Tools** endorsed by **TECH Global University**, the world's largest online university.

**TECH Global University**, is an official European University publicly recognized by the Government of Andorra ([official bulletin](#)). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

This **TECH Global University** private qualification, is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in Industrial Safety Methodology and Tools**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**





## Postgraduate Certificate Industrial Safety Methodology and Tools

- » Modality: online
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