

# Postgraduate Diploma

## Quality and Safety Management in Industrial Chemical Processes





## Postgraduate Diploma Quality and Safety Management in Industrial Chemical Processes

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

Website: [www.techtute.com/in/engineering/postgraduate-diploma/postgraduate-diploma-quality-safety-management-industrial-chemical-processes](http://www.techtute.com/in/engineering/postgraduate-diploma/postgraduate-diploma-quality-safety-management-industrial-chemical-processes)

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# 01

# Introduction

The updating and expansion of environmental management systems or the increased interest of companies in calculating their carbon footprint has led the Chemical Industry to focus on quality and safety management. In this sense, the engineers play a key role given their knowledge, although they need to keep abreast of regulatory change, as well as of the most effective strategies for managing crises, identifying hazards, and preventing atmospheric, soil, and water pollution. For this reason, TECH has created this 100% online program, which provides the best teaching material, accessible 24 hours a day, from any digital device with an Internet connection.



“

*Enroll in a Postgraduate Diploma that will enhance your skills in Quality and Safety Management in Industrial Chemical Processes”*

One of the major concerns of chemical plants is the safety of processes and facilities. In addition, companies are increasingly interested in sustainability, both in their products and in the emissions caused by their production. In this sense, in recent years there has been a greater involvement of the industry, which has adapted to the different international regulations in terms of quality and risk prevention.

A reality that leads engineers to be aware of hazard analysis methodologies, emergency response systems, therefore, as well as the different environmental management systems. This 6-month Postgraduate Diploma, developed by an excellent team of experts in Chemical Engineering and Law, is in this line.

The high school students are, in this way, facing a program that will allow them to be up-to-date on industrial safety, risk prevention in process plants, the organization, and management of companies in the chemical sector, and process quality assurance. To this end, the graduates have at their disposal numerous pedagogical tools (video summaries, detailed videos, readings, and case studies), accessible at any time of the day and from a digital device.

Likewise, thanks to the Relearning method, the student will achieve a much more effective learning process in less time by reducing the long hours of study and memorization. The engineers are therefore faced with a flexible educational proposal designed to provide them with the knowledge they need to progress in the sector.

This **Postgraduate Diploma in Quality and Safety Management in Industrial Chemical Processes** contains the most complete and up-to-date program on the market. The most important features include:

- ◆ The development of practical cases presented by experts in Chemistry Engineering
- ◆ 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
- ◆ 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



*TECH has designed a flexible program that adapts to your schedule and professional motivations"*



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*In this program you will analyze with the best material the corporate carbon and environmental footprints, as well as the tools for their application"*

*Lead the human resources management and business organization of a chemical company thanks to this intensive training.*

*You will be able to design and manage safety projects throughout the life cycle of a chemical plant.*

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 educational year. For this purpose, the students will be assisted by an innovative interactive video system created by renowned and experienced experts.



# 02 Objectives

This Postgraduate Diploma has been planned so that the high school students, throughout 6 months, can obtain an intensive learning of great professional utility around the Quality and Safety Management in Industrial Chemical Processes. To achieve this goal more easily and effectively, TECH provides numerous innovative educational materials and a syllabus with a theoretical-practical perspective. In this way, the graduate will have a unique opportunity for progression at the hands of the best experts in this industry.





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*In 6 months you will be an expert on the environmental impact of the Chemical Industry and the international regulations that regulate it"*



## General Objectives

- ◆ Analyze the principles and methods for the separation of substances in multicomponent systems
- ◆ Master advanced techniques and tools for the configuration of heat exchange networks
- ◆ Apply fundamental concepts in the design of chemical products and processes
- ◆ Integrate environmental considerations in the design of chemical processes
- ◆ Analyze optimization techniques and simulation of chemical processes
- ◆ Apply simulation techniques to common unit operations in the chemical industry
- ◆ Examine the multi-product industry and strategies for its optimization
- ◆ Raise awareness of the importance of sustainability in terms of economy, environment, and society
- ◆ Promote environmental management in the chemical industry
- ◆ Compile technological advances in Chemical Engineering
- ◆ Evaluate the applicability and potential advantages of new technologies
- ◆ Develop a comprehensive view of modern chemical engineering
- ◆ Contextualize the importance of biomass in the current framework of sustainable development
- ◆ Determine the importance of biomass as an energy resource
- ◆ Examine the current situation of L+O+I in Chemical Engineering in order to highlight its importance in the current sustainability framework
- ◆ Encourage innovation and creativity in the research processes in Chemical Engineering
- ◆ Analyze the ways of protection, exploitation, and communication of L+O+I results
- ◆ Explore job opportunities in L+O+I in Chemical Engineering
- ◆ Explore innovative applications of chemical reactors
- ◆ Promote the integration of theoretical and practical aspects of chemical reactor design





## Specific Objectives

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### Module 1. Sustainability and Quality Management in the Chemical Industry

- ◆ Examine international regulations and environmental management tools in the chemical industry
- ◆ Develop specialized knowledge on corporate carbon and environmental footprinting
- ◆ Assess the importance of the chemical life cycle
- ◆ Specify the quality guarantees for chemical products and processes
- ◆ Present integrated management systems

### Module 2. Industrial Safety in the Chemical Sector

- ◆ Provide a comprehensive understanding of industrial safety in the chemical sector
- ◆ Prepare emergency plans and accident investigations in the chemical industry
- ◆ Substantiate environmental protection measures based on the environmental risks of the chemical industry
- ◆ Determine the importance of industrial safety based on its historical evolution
- ◆ Promote safety culture in the industrial environment
- ◆ Use qualitative methods for risk analysis in the chemical industry
- ◆ Risk assessment in the chemical industry using quantitative methods of analysis
- ◆ Compile methods and equipment for worker protection
- ◆ Specify the classification of chemical products and their storage

### Module 3. Organization and Management of Companies in the Chemical Sector

- ◆ Explore and analyze the different tools for the development of managerial and entrepreneurial skills
- ◆ Examine the main international agreements of the Chemical Industry
- ◆ Analyze strategies for motivating and training personnel in the Chemical Industry
- ◆ Assess efficient work organization methods
- ◆ Concrete effective teamwork techniques in the Chemical Industry
- ◆ Determine corporate social responsibility in the Chemical Industry
- ◆ Promote entrepreneurship in the chemical sector



*The case studies will allow you to delve into the most effective accident investigation methodologies and integrate them into your professional performance"*

03

# Course Management

In order to offer a high-level of education, TECH has assembled a multidisciplinary management and faculty with extensive experience in the Chemical Engineering sector and in dealing with environmental legal issues. In this sense, the graduate will have the guarantee of access to an advanced syllabus, based on the latest scientific evidence and current activity in the sector. Also, thanks to the proximity of the faculty, you will be able to resolve any questions you may have during the course of this university program.





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*You have a syllabus prepared by leading specialists in Chemical Engineering and Law"*



## Management



### Dr. Barroso Martín, Isabel

- ♦ Expert in Inorganic Chemistry, Crystallography and Mineralogy
- ♦ Postdoctoral researcher of the I Own Research and Transfer Plan of the University of Málaga
- ♦ Research Staff at the University of Málaga
- ♦ ORACLE Programmer in CMV Consultants Accenture
- ♦ PhD in Sciences from the University of Málaga
- ♦ Master's Degree in Applied Chemistry - specialization in materials characterization - from the University of Málaga
- ♦ Master's Degree in SE, High School, Vocational Training, and Language Teaching - specializing in Physics and Chemistry University of Malaga



## Professors

### Dr. Jiménez Gómez, Carmen Pilar

- ◆ Technical support staff at the Central Research Services of the University of Málaga
- ◆ Laboratory technician assistant at Acerinox
- ◆ Laboratory technician in Axaragua
- ◆ Predoctoral fellow at the Department of Inorganic Chemistry, Crystallography, and Mineralogy of the University of Málaga
- ◆ PhD in Chemical Sciences from the University of Málaga
- ◆ Chemical Engineer from the University of Málaga
- ◆ Direction of Final Degree Project in Chemical Engineering (2016)
- ◆ Teaching collaborator in different degrees: Chemical Engineering, Energy Engineering, and Industrial Organization Engineering at the University of Málaga

### Mr. Barroso Martín, Santiago

- ◆ Legal Content Editor at Engineering and Advanced Integration S.A. / BABEL
- ◆ Administrative Lawyer at the Illustrious College of Lawyers of Málaga
- ◆ Paralegal Advisor at Garcia de la Vega Attorneys
- ◆ Law Degree from the University of Málaga
- ◆ Master's Degree in Corporate Legal Consultancy (MAJE) from the University of Málaga
- ◆ Expert Master's Degree in Labor, Tax and Accounting Consulting by Help T Pyme

# 04

# Structure and Content

TECH has developed this Postgraduate Diploma based on the most rigorous and current information on Quality and Safety Management in Industrial Chemical Processes. This is an intensive program that will lead the graduate to obtain advanced learning about sustainability, the regulations governing quality management, as well as the organization of companies in this sector. In this way, the high school students will get a comprehensive education, which will allow them to grow professionally in the industry.







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*It further extends the information in this program thanks to the scientific literature provided by the expert faculty team in Chemical Engineering”*

## Module 1. Sustainability and Quality Management in the Chemical Industry

- 1.1. Environmental Management Systems
  - 1.1.1. Environmental Management
  - 1.1.2. Environmental Impact Assessment
  - 1.1.3. ISO 14001 Standard and Continuous Improvement
  - 1.1.4. Environmental Auditing
- 1.2. Carbon and Environmental Footprint
  - 1.2.1. Corporate Sustainability
  - 1.2.2. Corporate Carbon and Environmental Footprint
  - 1.2.3. Carbon Footprint Calculation of an Organization
  - 1.2.4. Application of the Corporate Environmental Footprint
- 1.3. Sustainable Water Management in Industry
  - 1.3.1. Planning the Sustainable Use of Water Resources through Hydrological Modeling
  - 1.3.2. Responsible Use of Water in Industrial Chemical Processes
  - 1.3.3. Use of Nature-Based Solutions in Industry
- 1.4. Life Cycle Analysis
  - 1.4.1. Sustainable Industrial Production
  - 1.4.2. Product Life Cycle Components
  - 1.4.3. Phases of the Life Cycle Analysis Methodology
  - 1.4.4. ISO 14040 Standard for Product Life Cycle Assessment
- 1.5. Quality Management Systems
  - 1.5.1. Quality Principles and Evolution
  - 1.5.2. Quality Control and Assurance
  - 1.5.3. ISO 9001
- 1.6. Process Quality Assurance
  - 1.6.1. Quality Management Systems and Its Processes
  - 1.6.2. Steps in the Quality Assurance Process
  - 1.6.3. Standardized Processes
- 1.7. Quality Assurance of the Final Product
  - 1.7.1. Standardization
  - 1.7.2. Equipment Calibration and Maintenance
  - 1.7.3. Product Approvals and Certifications
- 1.8. Implantation of Integrated Management System
  - 1.8.1. Integrated Management System
  - 1.8.2. Implantation of Integrated Management System
  - 1.8.3. GAP Analysis

- 1.9. Change Management in the Chemical Industry
  - 1.9.1. Change Management in the Industry
  - 1.9.2. Industry of Chemical Processes
  - 1.9.3. Change Planning
- 1.10. Sustainability and Minimization: Integrated Waste Management
  - 1.10.1. Minimization of Industrial Waste
  - 1.10.2. Stages in the Minimization of Industrial Waste
  - 1.10.3. Recycling and Treatment of Industrial Waste

## Module 2. Industrial Safety in the Chemical Sector

- 2.1. Safety in the Chemical Industry
  - 2.1.1. Safety in the Chemical Industry
  - 2.1.2. Accidents in the Chemical Industry
  - 2.1.3. International Safety Regulations in the Chemical Industry
  - 2.1.4. Safety Culture in the Industry
- 2.2. Risk Prevention in Process Plants
  - 2.2.1. Inherent Safety Design to Minimize Risk
  - 2.2.2. Use of Safety Barriers and Control Systems
  - 2.2.3. Maintenance of Safety Systems in the Life Cycle of the Chemical Plant
- 2.3. Structured Hazard Identification Methods
  - 2.3.1. HAZOP Hazard and Operability Analysis
  - 2.3.2. LOPA Risk and Operability Analysis with Layers of Protection
  - 2.3.3. Comparison and Combination of Structured Methods
- 2.4. Quantitative Methods of Hazard Analysis
  - 2.4.1. Diagrams of Events
  - 2.4.2. Diagrams of Failures
  - 2.4.3. Consequence Analysis and Risk Estimation
- 2.5. Workers Safety in the Chemical Industry
  - 2.5.1. Safety in the Workplace
  - 2.5.2. Protective Measures in the Handling of Chemical Products
  - 2.5.3. Worker Safety Training and Coaching
- 2.6. Use of Chemical Products
  - 2.6.1. Incompatibilities in Chemical Products Storage
  - 2.6.2. Handling of Chemical Substances
  - 2.6.3. Safety in the Use of Hazardous Chemicals



- 2.7. Emergency Strategies
    - 2.7.1. Integral Emergency Planning in the Chemical Industry
    - 2.7.2. Development of Emergency Scenarios
    - 2.7.3. Development of Emergency Plan Simulations
    - 2.7.4. Crisis Management and Continuity
  - 2.8. Environmental Risks in Chemical Industry
    - 2.8.1. Air Pollution Sources and Air Pollutant Dispersion Mechanisms
    - 2.8.2. Sources of Soil Contamination and Their Impact on Biodiversity
    - 2.8.3. Sources of Water Resources Contamination and Their Impact on Water Availability
  - 2.9. Environmental Protection Measures
    - 2.9.1. Air Pollution Control
    - 2.9.2. Soil Contamination Control
    - 2.9.3. Water Resources Contamination Control
  - 2.10. Investigating Accidents
    - 2.10.1. Accident Investigation Methodologies
    - 2.10.2. Stages in Accidents Investigation
    - 2.10.3. Human and Organizational Error Analysis
    - 2.10.4. Communication and Continuous Improvement
- Module 3. Organization and Management of Companies in the Chemical Sector**
- 3.1. RRHH Management in the Chemical Sector
    - 3.1.1. Human Resources
      - 3.1.1.1. Formation and Motivation of the Human Team in the Chemical Sector
    - 3.1.2. Job Analysis: Group Organization
    - 3.1.3. Payroll and Incentives
  - 3.2. Organization of Work in the Chemical Sector
    - 3.2.1. Work Planning: Taylor's Organizational Theory
    - 3.2.2. Personal Recruitment in the Chemical Sector
    - 3.2.3. Organization of the Work Team
    - 3.2.4. Teamwork Techniques
  - 3.3. Organization of the Company
    - 3.3.1. Elements in the Organization of the Company
    - 3.3.2. Organizational Structure in the Chemical Industry
    - 3.3.3. Division of Labor
  - 3.4. Chemical Production Management and Organization
    - 3.4.1. Strategic Decisions in Chemical Production
    - 3.4.2. Production Planning
    - 3.4.3. Theory of the Limitations
    - 3.4.4. Short-Term Programming
  - 3.5. Financial Business Management
    - 3.5.1. Financial Planning
    - 3.5.2. Company Valuation Methods
    - 3.5.3. The Investment: Static and Dynamic Inversion Methods
  - 3.6. Development of Manager Skills
    - 3.6.1. Creative Problem Solving
    - 3.6.2. Corporate Conflict Management
    - 3.6.3. Empowerment and Delegation: Pyramidal Structure
    - 3.6.4. Formation of Efficient Teams
  - 3.7. Business Plan
    - 3.7.1. Legal-Fiscal Plan
    - 3.7.2. Operational Plan
    - 3.7.3. Marketing Plan
    - 3.7.4. Economic-Financial Plan
  - 3.8. Business and Corporate Social Responsibility
    - 3.8.1. Governance in RSE and RSC
    - 3.8.2. Criteria for the Analysis of RSC in the Chemical Industry
    - 3.8.3. RSE and CSR Implications
  - 3.9. International Agreements in the Chemical Sector
    - 3.9.1. Rotterdam Convention on the Export and Import of Hazardous Chemicals
    - 3.9.2. Chemical Weapons Convention
    - 3.9.3. Stockholm Convention on Persistent Organic Pollutants
    - 3.9.4. Strategic International Chemicals Management Agreement
  - 3.10. Ethical Controversies in the Chemical Industry
    - 3.10.1. Environmental Challenges
    - 3.10.2. Distribution and Use of Natural Resources
    - 3.10.3. Implications of Negative Ethics

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.





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*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.

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*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.



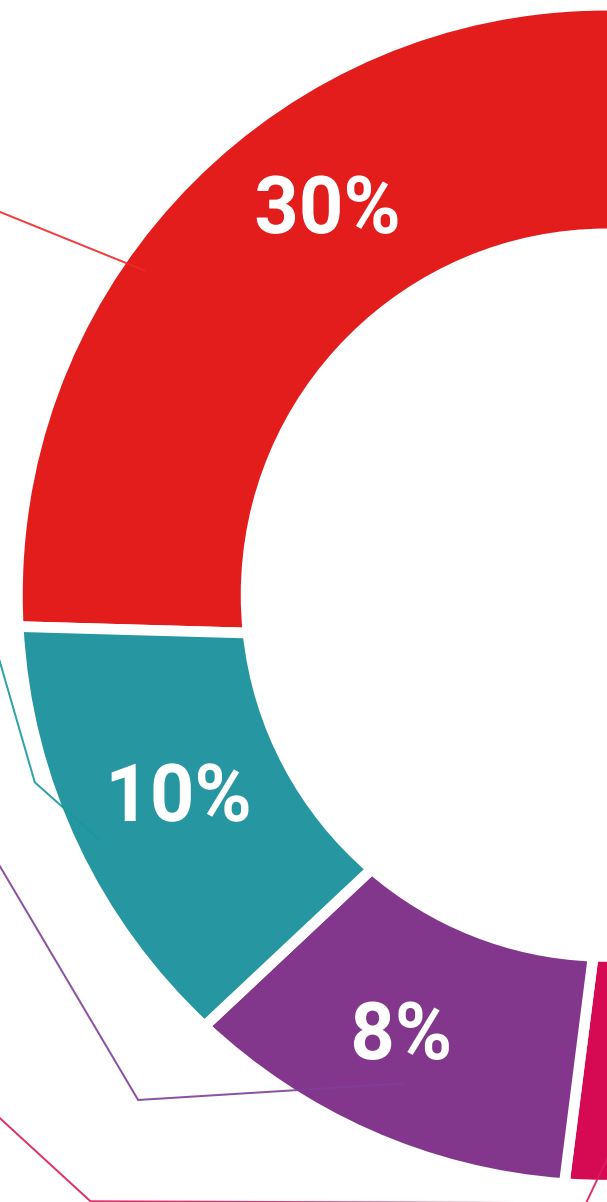
### Practising Skills and Abilities

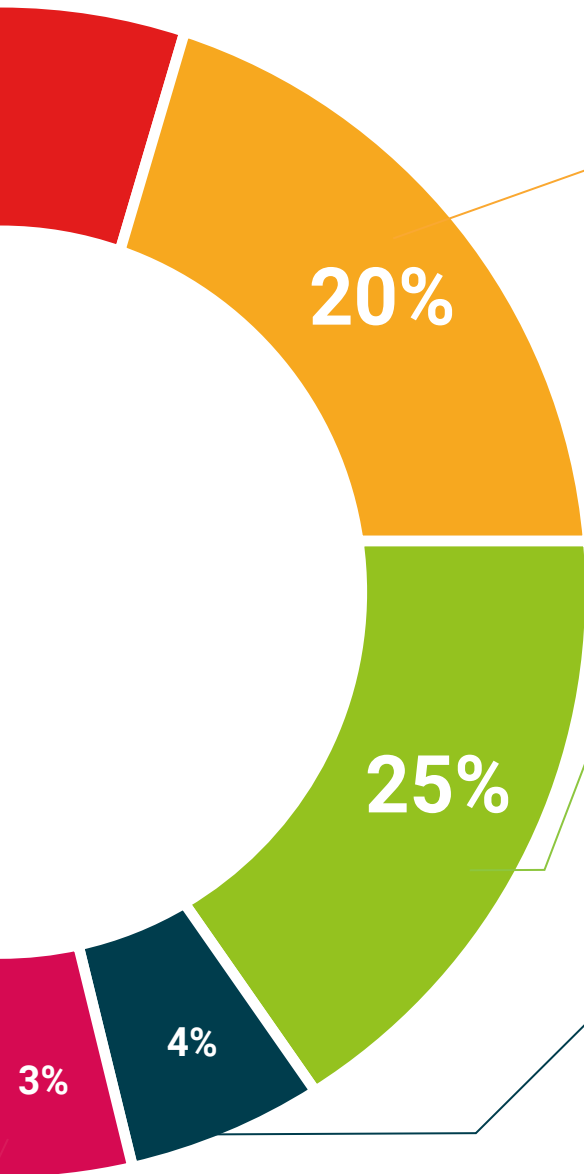
They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.



### 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 Quality and Safety Management in Industrial Chemical Processes 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 Quality and Safety Management in Industrial Chemical Processes** 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 and Safety Management in Industrial Chemical Processes**

Official N° of Hours: **450 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.



**Postgraduate Diploma**  
Quality and Safety  
Management in Industrial  
Chemical Processes

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



# Postgraduate Diploma

## Quality and Safety Management in Industrial Chemical Processes