

# Postgraduate Certificate Chemical Engineering in the Food Industry



## Postgraduate Certificate Chemical Engineering in the Food Industry

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

Website: [www.techtute.com/in/nutrition/postgraduate-certificate/chemical-engineering-food-industry](http://www.techtute.com/in/nutrition/postgraduate-certificate/chemical-engineering-food-industry)

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# 01

# Introduction

The food industry is one of the industries with the greatest participation in the market, as it is mainly responsible for providing products suitable for human consumption, and for this reason it must have specific procedures that allow for the adequate conservation of their properties. And this process is possible thanks to the fundamentals that chemistry provides to this sector and that are very useful to carry out a quality treatment of the food that must be subjected to these activities. With this in mind, TECH developed an academic programme that will provide students with an update in this area through a 100% online methodology that will allow students to have greater control over their time.





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*Don't miss this opportunity and be the best professional specialised in Chemical Engineering in the Food Industry, thanks to this program”*



Chemical Engineering in the Food Industry is an interdisciplinary field that combines the principles of this science with those of nutrition in order to achieve the design and optimisation of processes related to food production. Its importance is such that without it there would be no safety of consumption of these products and its wrong implementation could trigger health problems, so professionals specialised in this field are really essential for this sector.

For this reason, we present this Postgraduate Certificate, which is focused on addressing fundamental topics for the student to master and apply the essential concepts within the food industry, including unit and stage operations, material balances, chemical kinetics, reactor design and the principles of thermodynamics.

With this, the student will be able to strengthen their skills in the application of concepts from this field of study within the most important procedures during the treatment of food and the preservation of its components. In addition, it will appropriate technical aspects that are directly related to chemical equilibrium with the aim of improving the effectiveness of the processes.

All this, based on the innovative Relearning methodology that will allow students to study 100% online, a benefit that is possible thanks to the 24-hour access to multimedia resources. In addition, students will strengthen their problem-solving skills by analysing practical cases and generating solutions that are fully applicable to a real professional environment.

This **Postgraduate Certificate in Chemical Engineering in the Food Industry** contains the most complete and up-to-date scientific program on the market. The most important features include:

- ◆ The development of case studies presented by experts in Chemical Engineering in the Food Industry
- ◆ 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 to the expert, debate forums on controversial topics, and individual reflection assignments
- ◆ The availability of access to content from any fixed or portable device with an internet connection



*Take your career to the next level  
and access the best opportunities  
in the Food Industry”*

“

*With the knowledge you will acquire about chemistry and the environment, you will be able to manage food preservation processes that are less harmful to the environment”*

*Relearning methodology allows you to learn at your own pace, without the need to travel to a learning centre. Don't wait any longer and start now.*

*Learn how to time reactions and the mechanisms to achieve them, thanks to a section on chemical kinetics in the syllabus.*

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

Its 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 an immersive education programmed to learn in real situations.

The design of this program focuses on Problem-Based Learning, by means of which the professional must try to solve the different professional practice situations that are presented throughout the academic course. For this purpose, the student will be assisted by an innovative interactive video system created by renowned experts.



# 02 Objectives

The main purpose of this Postgraduate Certificate is to provide the student with the fundamental tools to effectively carry out the integration of chemical aspects with the processes of the Food Industry. In this way, students will be able to update their knowledge in this field and improve their skills to face the specific challenges of this area, using multimedia materials specially designed by leading professionals in this field.





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*Master the most advanced knowledge on the application of chemical fundamentals within the process of making elements and become the best professional in this sector”*



## General Objectives

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- ◆ Identify and understand Biology as an experimental science through the application of the scientific method
- ◆ Explain key principles and how to apply them to population growth and the sustainable exploitation of natural resources
- ◆ Know and apply the procedures for toxicity assessment
- ◆ Contribute to consumer protection within the framework of food safety

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*Go beyond your limits with the most innovative multimedia content on the market, only offered by this Postgraduate Certificate”*







## Specific Objectives

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- ◆ Interpret and elaborate flow diagrams from a process description
- ◆ Study and perform unit changes in magnitudes and equations
- ◆ Propose and solve matter and energy balances in systems with and without chemical reaction, in steady state and non-steady state, as well as in processes related to the food industry
- ◆ Address the mechanical energy balance, and apply it to simple cases of fluid flow through pipes
- ◆ Explore some of the most commonly used pressure measurement elements
- ◆ Apply the concepts and knowledge acquired to solve problems related to the food industry
- ◆ Pose and solve kinetic rate equations for the most common cases in batch and continuous reactors, in steady state
- ◆ Be familiar with the most common types of reactors used in the food industry, and to be able to perform design calculations of the most typical ones
- ◆ Identify possible uses of the studied concept in kinetics and reactors, and decide on their specific application

03

# Structure and Content

The best specialists in Chemical Engineering have developed the syllabus of this Postgraduate Certificate, with the purpose of providing students with a specialised understanding of its implementation within the Food Industry and the most significant aspects related to it. This will be done through the study of multimedia resources and the analysis of case studies, elements that will strengthen students' problem-solving skills.







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*A Postgraduate Certificate program that will allow you to strengthen your mastery of skills related to chemistry and nutrition”*



## Module 1. Chemical Engineering Fundamentals

- 1.1. Introduction to Chemical Engineering
  - 1.1.1. The Chemical Process Industry: General Characteristics
  - 1.1.2. Unit and Stage Operations
  - 1.1.3. Stationary and Non-Stationary Regime
  - 1.1.4. International System of Units
  - 1.1.5. The Food Industry, Chemical Engineering and the Environment
- 1.2. Material Balance in Systems Without Chemical Reaction
  - 1.2.1. General Formula for the Total Material Balance and Applied to a Component
  - 1.2.2. Application of Material Balances: Systems with Bypass Current, Recirculation and Purge
  - 1.2.3. Steady State Systems
  - 1.2.4. Non-Steady State Systems
- 1.3. Material Balance in Systems with Chemical Reaction
  - 1.3.1. General Concepts: Stoichiometric Equation, Stoichiometric Coefficient, Extensive and Intensive Conversion
  - 1.3.2. Degree of Conversion and Limiting Reactant
  - 1.3.3. Application of the Material Balances to Reactive Systems
    - 1.3.3.1. Reactor/Separator System with Recirculation of Unconverted Reactant
    - 1.3.3.2. Reactor/Separator System with Recirculation and Purge
- 1.4. Heat Energy Balances
  - 1.4.1. Types of Energy: Formula for Total Energy Balance
  - 1.4.2. Energy balance in Steady State and Non-Steady State Systems
  - 1.4.3. Application of the Energy Balance in Reactive Systems
  - 1.4.4. Heat Energy Balances
- 1.5. Mechanical Energy Balances
  - 1.5.1. Mechanical Energy Balance
  - 1.5.2. Bernoulli's Equation
  - 1.5.3. Pressure Gauges: Manometers







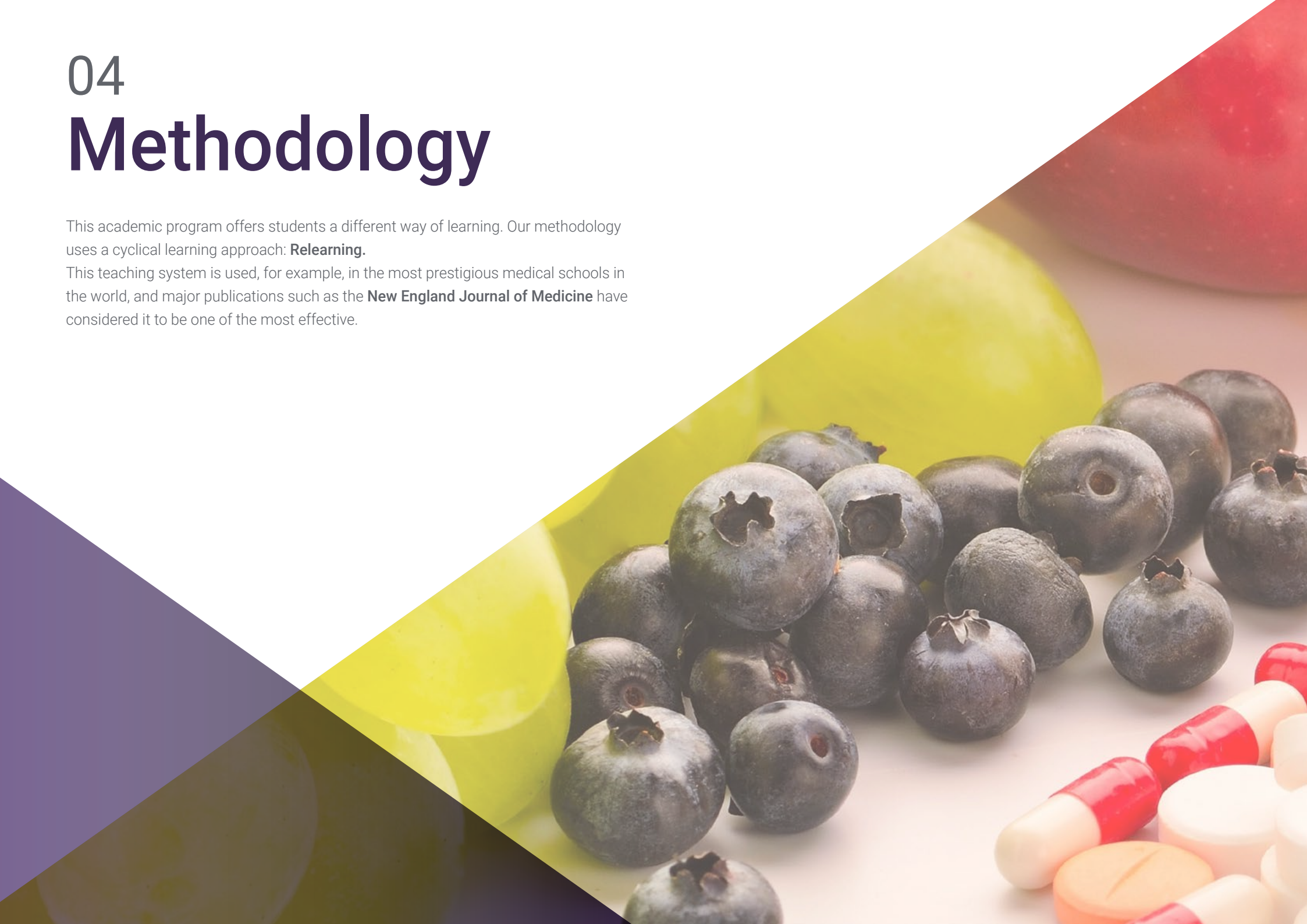
- 1.6. Chemical Kinetics and Reactor Engineering
  - 1.6.1. Definitions and Basic Concepts in Applied Chemical Kinetics and Reactor Engineering
  - 1.6.2. Classification of Reactions Expression of Reaction Rate Equations
  - 1.6.3. Study of the Dependence of Velocity on Temperature
  - 1.6.4. Reactor Classification
    - 1.6.4.1. Ideal Reactors: Design Equations and Characteristics
    - 1.6.4.2. Problem Solving
- 1.7. Velocity Equations in Constant Volume Reactors
  - 1.7.1. Velocity Equations for Elementary Reactions: Integral and Differential Methods
  - 1.7.2. Reversible reactions
  - 1.7.3. Parallel and Series Reactions
  - 1.7.4. Problem Solving
- 1.8. Reactor Design for the Food Industry
  - 1.8.1. General Characteristics of Reactor
  - 1.8.2. Types of Ideal Reactors
    - 1.8.2.1. Discontinuous Ideal Reactor
    - 1.8.2.2. Steady-State Complete Mix Flow Reactor
    - 1.8.2.3. Stationary Piston Flow Reactor
  - 1.8.3. Comparative Analysis of Reactors
  - 1.8.4. Production: Optimum Reactor Size
  - 1.8.5. Problem Solving
- 1.9. Chemical Thermodynamics and Solutions
  - 1.9.1. Systems, States and State Functions. Work and heat
  - 1.9.2. Principles of Thermodynamics Enthalpy: Hess' Law
    - 1.9.2.1. Entropy and Gibbs' Free Energy
    - 1.9.2.2. Solutions: Solubility and Saturation Solution Concentration
- 1.10. Chemical Equilibrium
  - 1.10.1. Chemical Equilibrium Reaction Rate and Equilibrium Constant Formula
  - 1.10.2. Types of Equilibria: Homogeneous and Heterogeneous
  - 1.10.3. Displacement of Chemical Equilibrium: Le Chatelier's Principle
  - 1.10.4. Solubility Equilibrium Precipitation Reactions

04

# 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"*

## At TECH we use the Case Method

In a given situation, what should a professional do? Throughout the program, students will face multiple simulated clinical cases, based on real patients, in which they will have to do research, establish hypotheses, and ultimately resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Specialists learn better, faster, and more sustainably over time.

*With TECH, nutritionists can experience a way of learning that is shaking the foundations of traditional universities around the world.*



According to Dr. Gérvas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, trying to recreate the real conditions of professional nutritional practice.



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*Did you know that this method was developed in 1912, at Harvard, for law students? The case method consisted of presenting students with real-life, complex situations for them to make decisions and justify their decisions on how to solve them. In 1924, Harvard adopted it as a standard teaching method”*

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

1. Nutritionists who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity through exercises to evaluate real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the nutritionist to better integrate knowledge into clinical practice.
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.



## Relearning Methodology

At TECH we enhance the case method with the best 100% online teaching methodology available: Relearning.

This university is the first in the world to combine the study of clinical cases with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, a real revolution with respect to the mere study and analysis of cases.

*The nutritionist will learn through real cases and by solving complex situations in simulated learning environments. These simulations are developed using state-of-the-art software to facilitate immersive learning.*





At the forefront of world teaching, the Relearning method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best online university (Columbia University).

With this methodology, more than 45,000 nutritionists have been trained with unprecedented success in all clinical specialties regardless of the surgical load. 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.*

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.

The overall score obtained by TECH's learning system is 8.01, according to the highest international standards.



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.



### Nutrition Techniques and Procedures on Video

TECH brings students closer to the latest techniques, the latest educational advances and to the forefront of current nutritional counselling techniques and procedures. All of this in direct contact with students and explained in detail so as to aid their assimilation and understanding. And best of all, you can watch the videos as many times as you like.



### 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".



### 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.





**Expert-Led Case Studies and Case Analysis**

Effective learning ought to be contextual. Therefore, TECH presents real cases in which the expert will guide students, focusing on and solving the different situations: a clear and direct way to achieve the highest degree of understanding.



**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.



**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.



**Quick Action Guides**

TECH offers the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical, and effective way to help students progress in their learning.





05

# Certificate

The Postgraduate Certificate in Chemical Engineering in the Food Industry 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 Chemical Engineering in the Food Industry** contains the most complete and up-to-date scientific 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 Chemical Engineering in the Food Industry**

Official N° of Hours: **150 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

online training

development languages

virtual classroom

**tech** technological  
university

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