

# Postgraduate Certificate

## Food Chemistry and Biochemistry





## Postgraduate Certificate Food Chemistry and Biochemistry

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

Website: [www.techtitute.com/pk/engineering/postgraduate-certificate/food-chemistry-biochemistry](http://www.techtitute.com/pk/engineering/postgraduate-certificate/food-chemistry-biochemistry)

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# 01

# Introduction

Within the food industry, the fundamentals of chemistry have begun to be integrated, since this allows for the generation of more specialized knowledge about the properties that make up foodstuffs. Likewise, the implementation of this science allows a deeper analysis of the functional properties of the nutrients of each consumable type product, and with this academic program, students will be able to delve deeper into these elements. This, thanks to the fact that the academic itinerary has a wide range of topics related to this area that will allow them to strengthen their skills, through a 100% online methodology, which will give them the opportunity to have more control over their time.



A close-up photograph of a person wearing blue nitrile gloves. They are holding a clear petri dish that contains several bright green leaves and a single red strawberry. The background is blurred, showing what appears to be a laboratory or food processing environment. The image is partially obscured by a dark purple diagonal overlay on the right side of the page.

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*Enroll now in the best Postgraduate Certificate Program in Food Chemistry and Biochemistry and the only one that will advance your professional career”*

Food Chemistry and Biochemistry is an interdisciplinary field of study that combines chemical scientific knowledge with aspects of nutrition, with the aim of understanding the composition, characteristics and properties of food, as well as the impact it has on human health. Therefore, it is necessary to have professionals in this area and, precisely, this Postgraduate Certificate is focused on training future specialists.

During the course of the syllabus, the student will be able to approach the concepts that are most involved with chemical processes and characteristics, including the importance of water in food and the functional properties of carbohydrates, components of vital importance in a balanced diet. In addition, you will learn about the most relevant nutrients for the proper functioning of the human body, with the objective of analyzing in depth their effects on the human organism.

With this, the student will get a specialized vision of this field, which will enhance their skills and will be able to immediately put into practice everything they will learn during this degree.

All this, through the innovative Relearning methodology, which allows students to take classes 100% online, avoiding the inconvenience of having to travel to a learning center and having access to multimedia resources 24 hours a day. In addition, students will enhance their problem-solving skills by analyzing practical cases that will allow them to place themselves in simulations of a real environment.

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

- ◆ The development of case studies presented by experts in food chemistry and biochemistry
- ◆ 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
- ◆ Content that is accessible from any fixed or portable device with an Internet connection



*A Postgraduate Certificate that will allow you to stand out in your work environment and add value to your professional profile”*

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*Be part of the professionals of the future and start this degree from the comfort of your home”*

*It delves into the role of carbohydrates as a component of fruits and vegetables.*

*Without haste and with calm, this is how you will learn once you start this Postgraduate Certificate program.*

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, it will be aided by an innovative system of interactive videos produced by renowned experts.



# 02 Objectives

The main objective of this academic program is to provide students with the necessary tools related to the concepts of chemistry and biochemistry in order to acquire specialized knowledge about the effects of these elements on food. With this, you will update your knowledge in this field and improve your skills to skillfully approach the procedures directly involved in food production.





A close-up photograph of a metal pipe. The pipe is dark and appears to be made of steel. The surface of the pipe is heavily rusted, with a thick layer of orange-brown rust covering most of the visible area. The rust is uneven, with some areas appearing more saturated than others. The pipe is positioned diagonally across the frame, from the bottom left towards the top right. The background is a dark, textured surface, possibly a wall or another part of the machinery.

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*You will acquire skills in food analysis, through the specialized knowledge that this degree will provide you with”*



## General Objectives

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- ◆ Acquire basic knowledge of epidemiology and prophylaxis
- ◆ To know and distinguish the physicochemical parameters that affect microbial growth in foods
- ◆ Identify the differential nature of acellular organisms (viruses, viroids and prions) in terms of their structure and mode of replication, with respect to eukaryotic and prokaryotic cell models





## Specific Objectives

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- ◆ Know, understand and use the principles of chemical and biochemical reactions in food in an appropriate professional context
- ◆ Identify and use the principles of food components and their physicochemical, nutritional, functional and sensory properties
- ◆ Acquire skills and abilities in food analysis
- ◆ Ability to identify the problems associated with different foods and their processing, different technological processes and the transformations that the products may undergo during these processes

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*An excellent academic program for professionals seeking excellence. Start now”*

# 03

## Structure and Content

The syllabus of this Postgraduate Certificate has been structured by specialists in Nutrition. Thus, students will acquire a specialized and updated knowledge about the most important chemical concepts related to food production, as well as the elements that Biochemistry can provide to this process. This, based on the use of multimedia resources and the analysis of practical cases, will allow students to improve their professional skills in this field.



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*The integration of the chemical principles and the elements of nutrition will be achieved once you complete this incredible curriculum”*

## Module 1. Food Biochemistry and Chemical

- 1.1. Water in food
  - 1.1.1. Importance of Water: in the Different Food
    - 1.1.1.1. Molecular structure and physicochemical properties
    - 1.1.1.2. Concept of water activity
  - 1.1.2. Methods of Determining of water activity
  - 1.1.3. Sorption isotherms
  - 1.1.4. Molecular mobility of water
  - 1.1.5. State diagrams: phase transition in foodstuffs
  - 1.1.6. Technological importance of water in industrial processes
- 1.2. Carbohydrate Metabolism
  - 1.2.1. Characteristics of the carbohydrates in foods
  - 1.2.2. Functional properties of mono- and oligosaccharides
  - 1.2.3. Structure and properties of polysaccharides
    - 1.2.3.1. Formation and stability of starch gels
    - 1.2.3.2. Factors influencing the formation of starch gels
- 1.3. Structural polysaccharides and their functions in foods
  - 1.3.1. Pectins. Cellulose and other cell wall components
  - 1.3.2. Polysaccharides from marine algae
- 1.4. Non-enzymatic and enzymatic browning
  - 1.4.1. General characteristics of non-enzymatic browning
  - 1.4.2. Non-enzymatic browning reactions
  - 1.4.3. Caramelization and Maillard reaction
  - 1.4.4. Mechanisms and control of nonenzymatic browning
  - 1.4.5. Enzymatic browning reactions and measures to control it
- 1.5. Carbohydrates in fruits and vegetables
  - 1.5.1. Metabolism of fruits and vegetables
  - 1.5.2. Biochemical reactions of carbohydrates in fruits and vegetables
  - 1.5.3. Control of post-harvest conditions: post-harvest treatment



- 1.6. Functional properties of lipids
  - 1.6.1. Characteristics of food lipids
  - 1.6.2. Functional properties of lipids: crystal formation and melting
  - 1.6.3. Emulsion formation and breaking
  - 1.6.4. Functions of emulsifiers and value of HLB
- 1.7. Lipid modifications in foods
  - 1.7.1. Main lipid modification reactions
    - 1.7.1.1. Lipolysis
    - 1.7.1.2. Autooxidation
    - 1.7.1.3. Enzymatic rancidity
    - 1.7.1.4. Chemical modifications of frying
  - 1.7.2. Physico-chemical treatments of lipid modification
    - 1.7.2.1. Hydrogenation
    - 1.7.2.2. Transesterification
    - 1.7.2.3. Fractioning
- 1.8. Functional properties of proteins and enzymes in food
  - 1.8.1. Amino acid characteristics and protein structure in foodstuffs
  - 1.8.2. Types of bonds in proteins. Functional properties
  - 1.8.3. Effect of treatments on protein systems in breads, meats and milk
  - 1.8.4. Types of food enzymes and applications
  - 1.8.5. Enzimas inmovilizadas y su uso en industria alimentaria
- 1.9. Pigments present in food
  - 1.9.1. General food characteristics
  - 1.9.2. Chemistry and biochemistry of myoglobin and hemoglobin
  - 1.9.3. Effect of processing storage on meat color
  - 1.9.4. Effects of processing on chlorophylls
  - 1.9.5. Structure of carotenoids and anthocyanins
  - 1.9.6. Color modifications in anthocyanins and chemical reactions involving anthocyanins
  - 1.9.7. Flavonoids
- 1.10. General aspects of food additives
  - 1.10.1. Food Additive Concept
  - 1.10.2. General concept of food additive Additive labeling
  - 1.10.3. Life-extending additives
    - 1.10.3.1. Preservatives: sulfites and derivatives, nitrites, organic acids and derivatives, and antibiotics
  - 1.10.4. Antioxidants and their characteristics
  - 1.10.5. Texture-enhancing additives: Thickeners, gelling agents and stabilizers. Anti-caking agents. Flour treatment agents



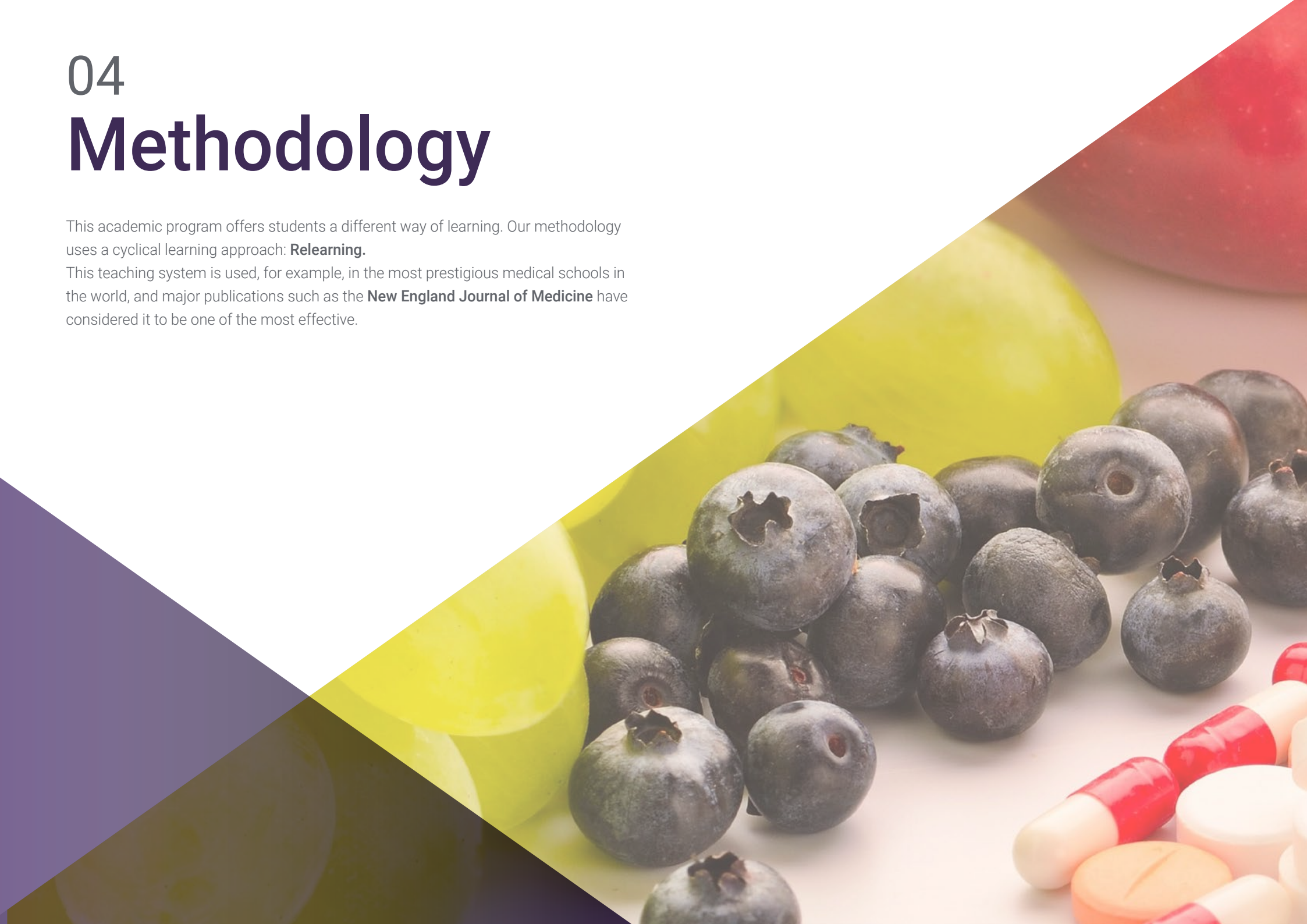
*TECH gives you all the tools to achieve your goals and the content of this program is one of them"*

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 Food Chemistry and Biochemistry 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 Food Chemistry and Biochemistry** 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 Food Chemistry and Biochemistry**

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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