

Postgraduate Certificate Chemical Food Analysis





Postgraduate Certificate Chemical Food Analysis

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

Website: www.techtute.com/us/nutrition/postgraduate-certificate/chemical-food-analysis

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01

Introduction

Chemical Food Analysis is crucial to ensure the quality and safety of products consumed on a daily basis. Therefore, food professionals must be trained in these techniques and methods to be able to evaluate the composition of each preparation and appreciate its nutrients, vitamins, minerals and contaminants. In addition, these procedures and skills are essential to improve manufacturing lines. TECH provides this program in which students will address all these aspects holistically and develop first level skills for their application holistically and develop first level skills for their application. All from a 100% online and interactive learning platform, without preset study schedules.





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TECH will train you in the application of immunochemical and genetic techniques in food analysis through this complete 100% online program"

Ensuring food quality and safety is essential to prevent illness, food poisoning and other ailments. Professionals in this sector must master the most advanced techniques and methods related to these aspects in order to detect possible contaminants and fraud in packaged foods. In this way, consumer confidence in producers is enhanced and all the corresponding steps in each line are ensured.

In this context, TECH provides this Postgraduate Certificate where we analyze from sample collection and preparation to the determination of nutrients, vitamins, inorganic elements and toxic compounds. In addition, immunochemical and genetic techniques and their application in food analysis are discussed.

In this way, the syllabus provides professionals with all the competencies to prevent risks and food poisoning. All this from an innovative 100% online and interactive content platform that does not follow predefined schedules. In it, each graduate will have the opportunity to self-manage his or her progress in a personalized progress in a personalized way.

At the same time, multimedia materials such as videos and infographics will be present in this digital space. From them, the student will appreciate the contents in different formats in different formats and deepen their application in the real world through the innovative Relearning method.

This **Postgraduate Certificate in Chemical Food Analysis** 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 Food Analysis
- ◆ The graphic, schematic, and practical contents with which they are created, provide 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



Acquire essential skills and specialize in the Chemical Analysis of products for the food sector with the multimedia materials that TECH offers in this degree"

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You will master, with this program, the techniques for detecting possible contaminants and food fraud”

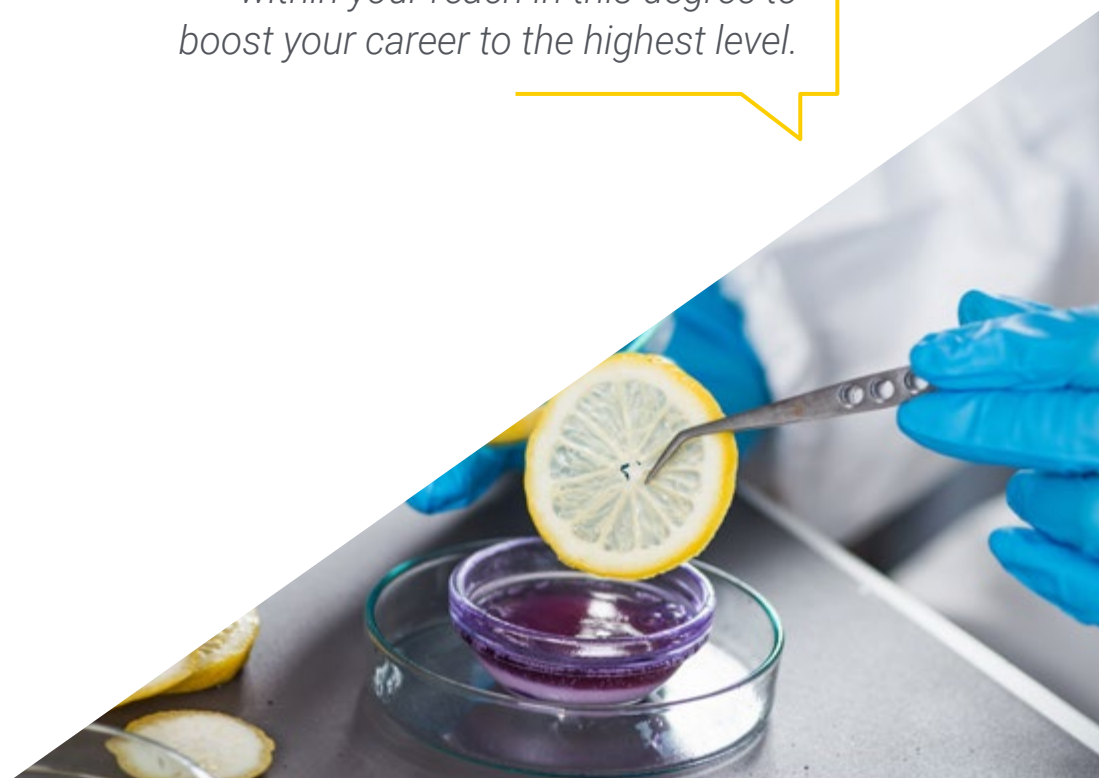
The program's teaching staff includes professionals from the sector who bring the experience of their work to this training, as well as recognised specialists from leading societies and prestigious universities.

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.

You will be able to prevent food poisoning or misjudging the nutrients of a product by studying this Postgraduate Certificate.

The most innovative contents and the best learning methodology are within your reach in this degree to boost your career to the highest level.



02 Objectives

The main objective of the Postgraduate Certificate in Chemical Food Analysis is to train students in the most advanced techniques and methods for the chemical analysis of food. The program is designed to provide a thorough understanding of the fundamental principles of chemical analysis, as well as the analytical techniques and equipment used in the food industry. Upon completion, each graduate will be able to apply top quality methods to improve production designs.





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Through a 100% online and interactive platform, you will develop basic knowledge about the exploration of natural resources in food production"



General Objectives

- ◆ 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
- ◆ Contribute to consumer protection within the framework of food safety

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Through this degree you will learn about the physicochemical, sensory and nutritional characteristics of food, their influence on the processing and quality of the final product”





Specific Objectives

- ◆ Analyze the fundamentals of chemical analysis of food, as well as the fundamentals of electrophoretic, immunochemical, enzymatic and genetic techniques and their application in the control of processes and products
- ◆ Identify and select the most appropriate analytical procedure for the determination of an analyte in a food depending on its matrix and concentration and the processing to which it has been subjected
- ◆ Interpret data and graphs derived from chemical, electrophoretic, immunochemical, enzymatic and genetic analysis, as well as solve computational problems derived from them
- ◆ Describe each of the steps involved in an analytical procedure
- ◆ Perform and reason the calculations involved in establishing the final concentration of various analytes
- ◆ Design a project, working as a team, detailing the chemical analyses that should be performed on a given raw material according to legal, technological and commercial criteria
- ◆ Determine the physicochemical, sensory and nutritional characteristics of foods, their influence on processing and on the quality of the final product
- ◆ To formulate new foods by choosing the ingredients and additives, as well as the most appropriate treatments to obtain safe, nutritious and attractive products for the consumer and attractive to the consumer

03

Structure and Content

This Postgraduate Certificate is exceptional because it offers a complete degree in the most advanced techniques and methods for in the most advanced techniques and methods for Food Chemical Analysis. Food Chemistry. Contents range from sampling and sample preparation to the determination of nutrients, vitamins, inorganic elements and toxic compounds. In addition, the program addresses immunochemical and genetic techniques and their application in food analysis. Thus, this academic pathway guarantees its graduates the necessary skills to provide safety and quality to food products, in the context of a discipline in continuous evolution.





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Relearning and other didactic methods applied by TECH in this degree will prepare you to face the main challenges of your professional practice”

Module 1. Chemical analysis of food

- 1.1. Introduction to Chemical Analysis
 - 1.1.1. Importance of Food Analysis Chemical
 - 1.1.2. General criteria for the choice of methods of chemical analysis of foods
 - 1.1.3. Recommended databases
- 1.2. Sample collection and preparation
 - 1.2.1. Sampling and selection of the sampling procedures
 - 1.2.2. Sample Preparation
 - 1.2.3. Homogenization: dry and wet solid samples
 - 1.2.3.1. Homogenizing equipment
 - 1.2.4. Enzymatic and chemical treatment of the sample
 - 1.2.5. Sample preservation and storage: types of containers
 - 1.2.6. Enzymatic inactivation
 - 1.2.7. Protection against bacterial growth and contamination
- 1.3. Moisture and ash determination
 - 1.3.1. Moisture determination
 - 1.3.1.1. Drying methods: kiln drying and halogen lamp drying
 - 1.3.1.2. Infrared drying
 - 1.3.1.3. Microwave Drying
 - 1.3.2. Distillation methods
 - 1.3.3. Chemical method: Karl Fischer
 - 1.3.4. Physical and electrical methods
 - 1.3.5. Refractometry
 - 1.3.6. Cryoscopy
 - 1.3.7. Spectroscopic methods
 - 1.3.8. Ash Determination
 - 1.3.9. Wet and dry calcination

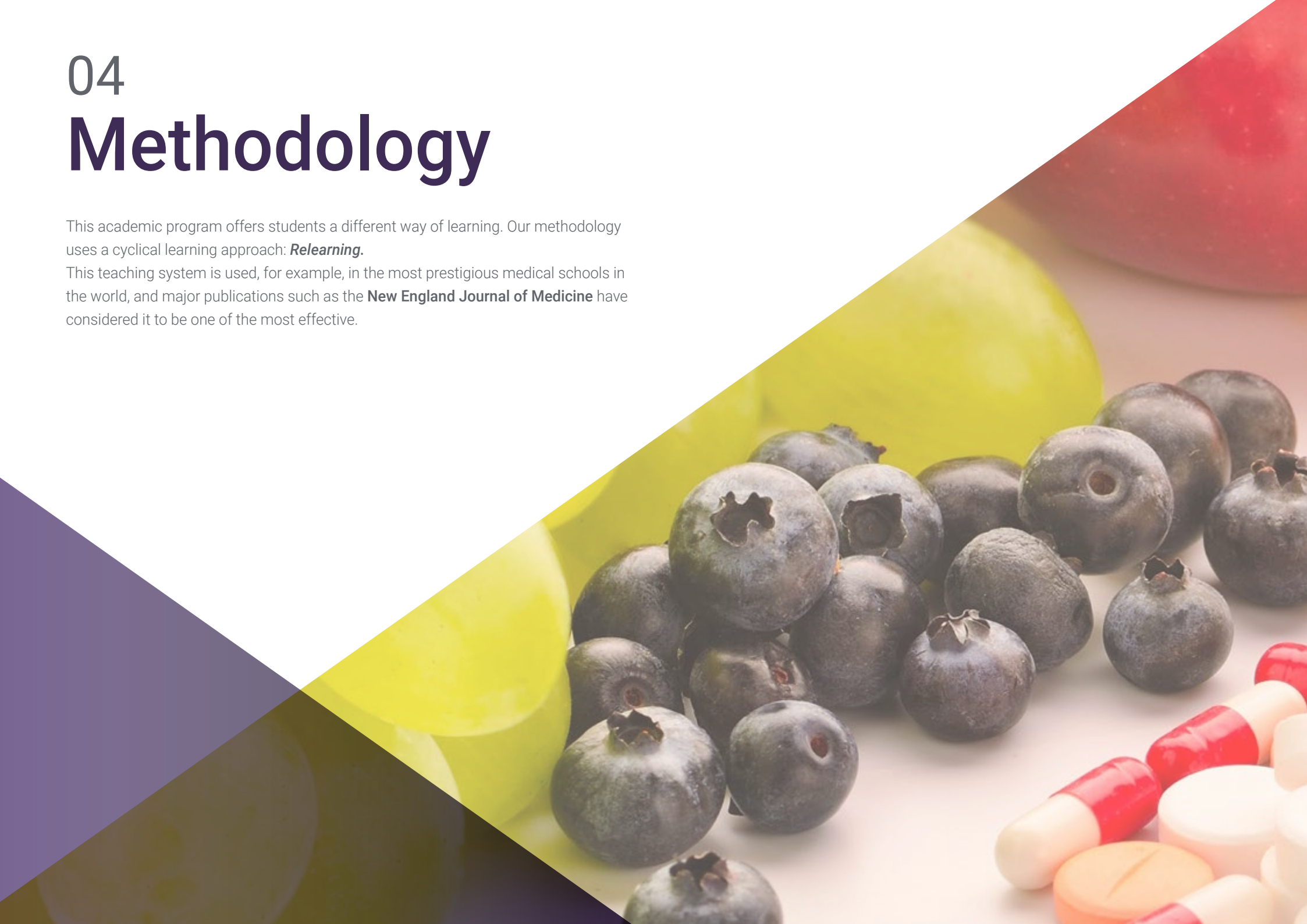


- 1.4. Lipid analysis
 - 1.4.1. Classification and identification of lipids
 - 1.4.2. Determination of lipid content
 - 1.4.3. Solvent extraction methods:
 - 1.4.3.1. Soxlet method
 - 1.4.3.2. Folch's method
 - 1.4.4. Solvent-free wet extraction methods
 - 1.4.5. Lipid characterization techniques: Iodine Index
 - 1.4.6. Methods for the determination of lipid fractions
 - 1.4.6.1. Determination of fatty acid profile
 - 1.4.6.2. Cholesterol and total sterols determination
 - 1.4.6.3. Determination of the degree of lipolysis
 - 1.4.7. Acid number
 - 1.4.8. Determination of the degree of oxidation. Peroxide index
- 1.5. Carbohydrate analysis
 - 1.5.1. Classification and importance of carbohydrates
 - 1.5.2. Determination of total carbohydrates
 - 1.5.3. Determination of reducing sugars: Luff-Schoorl method
 - 1.5.4. Determination of monosaccharides and oligosaccharides
 - 1.5.5. High performance liquid chromatography
 - 1.5.6. Enzymatic methods
 - 1.5.7. Physical methods: polarimetry, refractometry, refractometry
 - 1.5.8. Starch determination
 - 1.5.9. Degree of gelatinization and retrogradation
- 1.6. Analysis of proteins and other nitrogen compounds
 - 1.6.1. Nitrogen determination methods
 - 1.6.1.1. Kjeldahl method
 - 1.6.1.2. Dumas Method
 - 1.6.2. Ultraviolet and infrared absorption methods
 - 1.6.3. Colorimetric methods: Biuret's method
 - 1.6.4. Determination of amino acid composition
 - 1.6.5. Determination of the nutritional quality of proteins
 - 1.6.6. Determination of nitrates and nitrites
- 1.7. Determination of vitamins and inorganic elements
 - 1.7.1. Determination of vitamins
 - 1.7.2. Microbiological tests
 - 1.7.3. Chemical Methods
 - 1.7.4. Volumetric methods
 - 1.7.5. Fluorimetric methods
 - 1.7.6. Determination of inorganic elements
 - 1.7.6.1. Determination of chlorides by Mohr's Method
 - 1.7.6.2. Phosphorus determination by colorimetry
- 1.8. Immunochemical techniques: fundamentals and applications in food analysis
 - 1.8.1. Monoclonal and polyclonal antibodies
 - 1.8.2. Precipitation techniques
 - 1.8.3. Enzyme immunoassay techniques: Sandwich ELISA and competitive ELISA
 - 1.8.4. Immunoaffinity chromatography
 - 1.8.5. Techniques with paramagnetic nanospheres
 - 1.8.6. Applications of immunochemical techniques to food analysis
- 1.9. Genetic techniques: fundamentals and applications in food analysis
 - 1.9.1. Extraction of Nucleic Acids
 - 1.9.2. DNA and RNA analysis: Southern y Northern Blot
 - 1.9.3. In vitro amplification using polymerase chain reaction (PCR)
 - 1.9.4. Real-time PCR
 - 1.9.5. Application of genetic techniques in food analysis
- 1.10. Enzymatic techniques: fundamentals and applications in food analysis
 - 1.10.1. Continuous or end point determination
 - 1.10.2. Methods for measuring enzyme activity: spectrophotometry and fluorimetry
 - 1.10.3. Determination of food components: sugars, starch, cholesterol, etc
 - 1.10.4. Determination of the intensity of heat treatments: peroxidase, lipoxygenase, alkaline phosphatase
 - 1.10.5. Determination of the activity of enzymes of commercial interest: α -amylase, rennet

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. Gervas, 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.

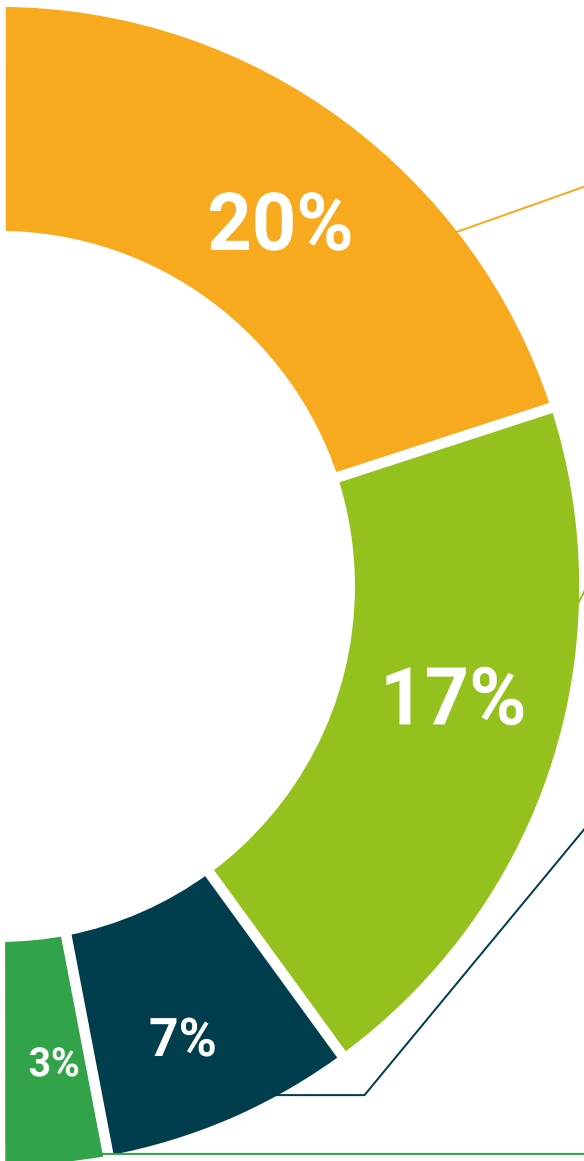
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



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 Food Analysis 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 program will allow you to obtain your **Postgraduate Certificate in Chemical Food Analysis** 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** title 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 Chemical Food Analysis**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**



*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH Global University 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 quality

online training

development languages

virtual classroom

tech global
university

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