



## Postgraduate Diploma

Analytical Techniques in R&D&I Project Quality Control

» Modality: online

» Duration: 6 months

» Certificate: TECH Technological University

» Dedication: 16h/week

» Schedule: at your own pace

» Exams: online

Website: www.techtitute.com/in/nutrition/postgraduate-diploma/postgraduate-diploma-analytical-techniques-rdi-project-quality-control

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## tech 06 | Introduction

Quality control of processes and products is essential to ensure food safety and to guarantee Good Manufacturing and Elaboration Practices (GMP) in the processes carried out in the food industry. For this reason, the Analytical and Instrumental Techniques module highlights the tools that guarantee food safety, which are mandatory and under the responsibility of the producers, either by controls of the food industry's own laboratories or by outsourcing the service to food and reference laboratories for the control of raw materials and products.

Moreover, R&D&I systems are presented in the development of new foods across the food industry that require new technologies, new processes and food safety systems that are increasingly specific and adapted to the characteristics of new foods. This program is the most complete among the different specializations offered by universities today, because it is oriented according to parameters of excellence, from the content to the teaching staff.

The teaching staff on this Postgraduate Diploma are university professors and professionals from various disciplines in primary production, the use of analytical and instrumental techniques for quality control, the prevention of accidental and intentional contamination and fraud, food safety/food integrity and traceability (food defence and food fraud/food authenticity). They are experts in food legislation and regulations on quality and safety, validation of methodologies and processes, digitalization of quality management, research and development of new foods and finally, the coordination and execution of R&D&I projects. This educational project has been designed with the commitment to train qualified professionals in the field. A program devised by specialists in each specific subject, who meet new challenges every day and who are committed to preparing students for the future.

This Postgraduate Diploma in Analytical Techniques in R&D&I Project Quality Control contains the most complete and up-to-date scientific program on the market. Its most notable features are:

- Case studies presented by experts in food safety at the nutritional level
- 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
- The latest news on Analytical Techniques in R&D&I Project Quality Control
- Practical exercises where self-assessment can be used to improve learning
- Its special emphasis on innovative methodologies in Analytical Techniques in R&D&l Project Quality Control
- 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



Applying quality controls in the creation of new foods is essential for their subsequent commercialization and consumption"



Discover the latest news on Analytical Techniques in R&D&I Project Quality Control and relaunch your career as a nutritionist"

The program's teaching staff includes professional food safety from a nutritional perspective, who bring their experience to this training program, as well as renowned specialists from leading communities 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 specialization 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 throughout the program. To that end, professionals will be assisted by an innovative, interactive video system made by recognized and extensively experienced experts in Analytical Techniques in R&D&I Project Quality Control.

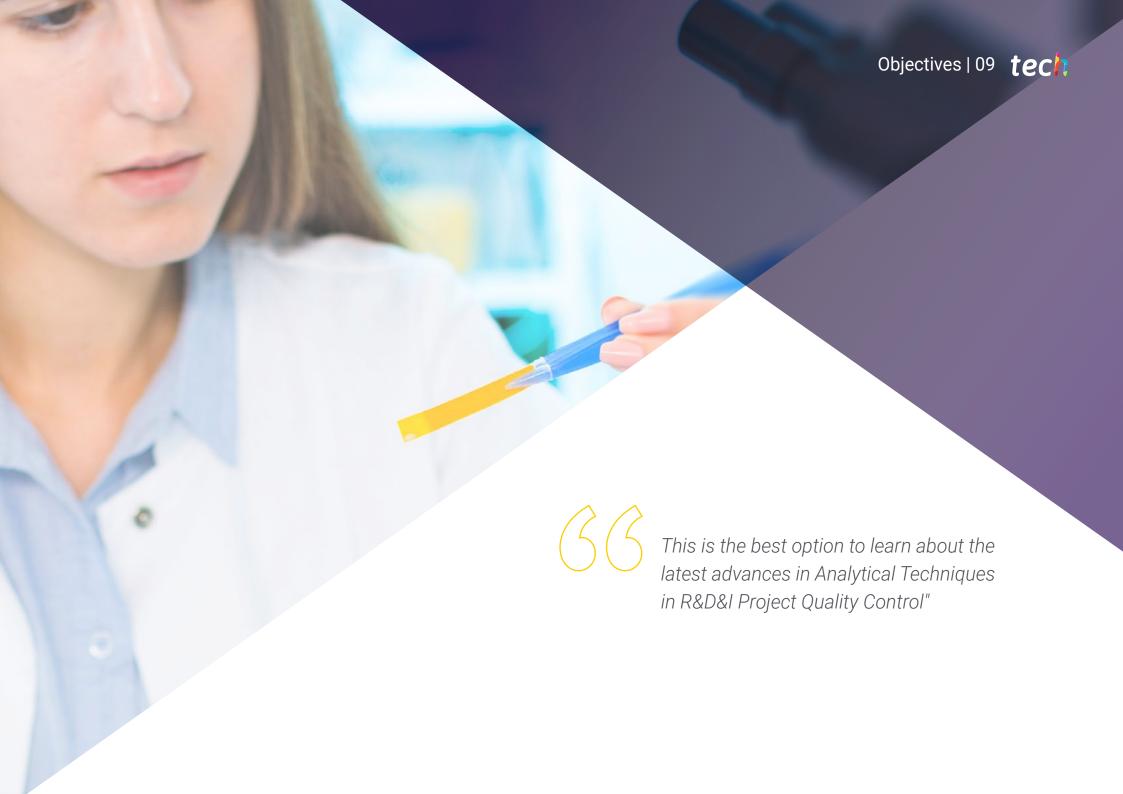
You will develop practical cases as presented by experts in food safety at the nutritional level throughout the Postgraduate Diploma.

A program that can be taken remotely, 100% online, and adapted to you and to 21st century education.



# 02 Objectives

The Postgraduate Diploma in Analytical Techniques in R&D&I Project Quality Control is aimed at facilitating professional performance in nutrition based on the latest and most innovative advances in the industry. All this will be delivered in an exclusively practical approach by means of the most complete theoretical and practical contents on the industry. Likewise, during the course of the Postgraduate Diploma, professionals will address the main interventions specialists conduct in food safety. This will allow them to improve and enhance their skills to the highest level, with the certainty of performing the protocols as effectively and as safely as possible.



## tech 10 | Objectives



### **General Objectives**

- Examine the regulations and standards for food laboratories and define their role in food safety
- Analyze food safety regulations and standards applicable to raw materials and products in food laboratories
- Determine the requirements to be met by food analysis laboratories (ISO IEC 17025 Standard, applicable to the accreditation and certification of quality systems in laboratories)
- Recognize the consumer's right to acquire safe, healthy and innocuous food from the agri-food chain, both nationally and internationally
- Establish R&D&I systems that enable the development of new foods and ingredients, especially in food safety issues, so that they can address research, development and innovation in this field
- Develop knowledge that provides a basis or opportunity for the development and/or application of ideas, in a research context, including reflections on the responsibilities linked to the application of their developments.
- Determine the functioning of R&D&I systems in the field of new product and process development in the food environment
- Analyze the R&D&I system and the use of tools for planning, management, evaluation, protection of results and dissemination of food R&D&I
- Develop knowledge that provides a basis or opportunity for the development and/or implementation of ideas, in a research and development context that allows to take the results to the productive sector





### **Specific Objectives**

## Module 1. Analytical and Instrumental Techniques in Process and Product Quality Control

- Establish the quality characteristics to be met by raw materials, intermediate and finished products according to their origin, prior to their laboratory analysis
- Develop the relevant methodology for product conformity, taking into account the applicable requirements considered by the regulations and standards
- Define the most appropriate methodology for food quality assessment: integrity analysis and characterization, including the detection of biotic or abiotic food contaminants that may pose a health risk to consumers
- Describe food sampling depending on source, use and characteristics or specifications
- Identify and recognize the analytical techniques used in food and manage an adequate quality control
- Describe the main agri-food contaminants and learn about the application of analytical techniques by observing the sector under revision
- Outline the process for identifying and ensuring the safety of raw materials, processed foods and the suitability of water in the production of safe products for food and feed

#### Module 2. R&D&I of Novel Foods and Ingredients

- Establish new trends in food technologies that give rise to the development of a line of research and implementation of new products in the market
- Establish the fundamentals of the most innovative technologies that require research and development work to understand their potential for use in the production of new foods and ingredients
- Design research and development protocols for the incorporation of functional ingredients to base foods, while observing techno-functional properties, as well as the technological process involved in production
- Compile new trends in food technologies that will lead to the development of a line of research and implementation of new products in the market
- Apply research and development methodologies to evaluate the functionality, bioavailability and bioaccessibility of novel foods and ingredients

#### Module 3. Development, Coordination and Execution of R&D&I Projects

- Establish R&D&I systems that enable the development of novel foods and ingredients especially in food safety issues, so that they can address research, development and innovation in the field of novel foods and ingredients
- Compile the sources of financing for R&D&I activities in the development of new food products that allow different innovation strategies in the food industry to be addressed
- Analyze the forms of access to public and private sources of information in the scientifictechnical, economic and legal fields for the planning of an R&D&I project
- Develop methodologies for project planning and management, control reporting and monitoring of results
- Evaluate the technology transfer systems that allow the transfer of R&D&I results to the productive environment
- Analyze the implementation of projects once their documentation stage has been completed





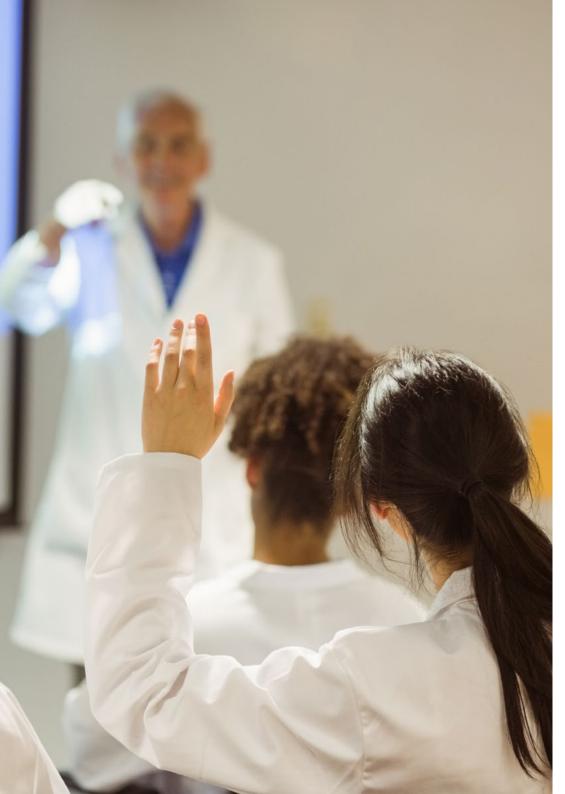
## tech 14 | Course Management

### Management



## Dr. Limón Garduza, Rocío Ivonne

- PhD in Agricultural Chemistry and Bromatology (Autonomous University of Madrid)
- Master's Degree in Food Biotechnology (MBTA) (University of Oviedo)
- Food Engineer, Bachelor in Food Science, and Technology (CYTA)
- Expert in Food Quality Management ISO 22000
- Specialist in Food Quality and Safety, Mercamadrid Training Center (CFM)



## Course Management | 15 tech

#### **Professors**

### Aranda Rodrigo, Eloísa

- Degree in Food Science and Technology
- It develops its activity in the food production environment, with laboratory analysis of water and food
- Training in Quality Management Systems, BRC, IFS and ISO 22000 Food Safety
- Experience in audits under ISO 9001 and ISO 17025 protocols

#### Dr. Rendueles de la Vega, Manuel

- Principal investigator in three projects of the National R&D Plan. Since 2004
- Doctor in Chemical Engineering, Professor of Chemical Engineering (University of Oviedo)
- Coordinator of the Master's Degree in Food Biotechnology at the University of Oviedo since 2013





## tech 18 | Structure and Content

## **Module 1.** Analytical and Instrumental Techniques in Process and Product Quality Control

- 1.1. Laboratory Types, Regulations and Standards
  - 1.1.1. Reference Laboratories
    - 1.1.1.1. European Reference Laboratory
    - 1.1.1.2. National Reference Laboratories
  - 1.1.2. Food Laboratory
  - 1.1.3. Regulations and Standards Applicable to Laboratories (ISO/IEC 17025)
    - 1.1.3.1. General Requirements for Laboratory Competence
    - 1.1.3.2. Equipment Testing and Calibration
    - 1.1.3.3. Implementation and Validation of Analytical Methods
- 1.2. Official Control of the Agri-Food Chain
  - 1.2.1. PNCPA of the Agri-Food Chain
  - 1.2.2. Competent Authorities
  - 1.2.3. Legal Support for Official Control
- 1.3. Official Methods of Food Analysis
  - 1.3.1. Methods of Animal Feed Analysis
  - 1.3.2. Water Analysis Methods
    - 1.3.2.1. Analytical Requirements According to Royal Decree 140/2003
    - 1.3.2.2. Sampling Frequencies according to Industry Type
  - 1.3.3. Methods of Analysis of Cereals
  - 1.3.4. Methods of Analysis of Fertilizers, Residues of Phytosanitary and Veterinary Products
  - 1.3.5. Methods of Analysis of Food Products
  - 1.3.6. Methods of Analysis of Meat Products
  - 1.3.7. Fat Analysis Methods
  - 1.3.8. Methods of Analysis of Dairy Products
  - 1.3.9. Methods of Analysis of Wines, Juices and Musts
  - 1.3.10. Methods of Analysis of Fishery Products





## Structure and Content | 19 tech

- 1.4. On-Site Analytical Techniques for Fresh Food Receiving, Processing and Finished Product
  - 1.4.1. In Food Handling
    - 1.4.1.1. Analysis of Environments and Surfaces
    - 1.4.1.2. Handler Analysis
    - 1.4.1.3. Equipment Analysis
  - 1.4.2. Analysis of Fresh Feed and Finished Product
    - 1.4.2.1. Product Data Sheets
    - 1.4.2.2. visual Inspection
    - 1.4.2.3. Color Charts
    - 1.4.2.4. Organoleptic Evaluation according to Food Type
  - 1.4.3. Basic Physicochemical Analysis
    - 1.4.3.1. Determination of Maturity Index in Fruit
    - 1.4.3.2. Firmness
    - 1.4.3.3. Brix Degrees
- 1.5. Nutritional Analysis Techniques
  - 1.5.1. Protein Determination
  - 1.5.2. Determination of Carbohydrates
  - 1.5.3. Determination of Fats
  - 1.5.4. Ash Determination
- 1.6. Microbiological and Physicochemical Food Analysis Techniques
  - 1.6.1. Preparation Techniques: Fundamentals, Instrumentation and Application in Food Processing.
  - 1.6.2. Microbiological Analysis
    - 1.6.2.1. Handling and Treatment of Samples for Microbiological Analysis
  - 1.6.3. Physical-Chemical Analysis
    - 1.6.3.1. Handling and Treatment of Samples for Physical-Chemical Analysis

## tech 20 | Structure and Content

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- 1.7.1. Characterization, Quality Indexes and Product Conformity
  - 1.7.1.1. Food Safety/Food Integrity
- 1.7.2. Analysis of Residues of Prohibited Substances in Food
  - 1.7.2.1. Organic and Inorganic Waste
  - 1.7.2.2. Heavy Metals
  - 1.7.2.3. Additives
- 1.7.3. Analysis of Adulterant Substances in Foodstuffs
  - 1.7.3.1. Milk
  - 1.7.3.2. Wine
  - 1.7.3.3. Honey
- 1.8. Analytical Techniques used in Genetically Modified Organisms (GMO) and Novel Foods
  - 1.8.1. Concept
  - 1.8.2. Detection Techniques
- 1.9. Emerging Analytical Techniques to Prevent Food Fraud
  - 1.9.1. Food Fraud
  - 1.9.2. Food Authenticity
- 1.10. Issuance of Certificates of Analysis
  - 1.10.1. In the Food Industry
    - 1.10.1.1. Internal Reporting
    - 1.10.1.2. Report to Customers and Suppliers
    - 1.10.1.3. Bromatological Expert Examination
  - 1.10.2. In Reference Laboratories
  - 1.10.3. In Food Laboratories
  - 1.10.4. In Arbitration Laboratories

#### Module 2. R&D&I of Novel Foods and Ingredients

- 2.1. New Trends in Food Product Processing
  - 2.1.1. Design of Functional Foods Aimed at Improving Specific Physiological Functions
  - 2.1.2. Innovation and New Trends in the Design of Functional Foods and Nutraceuticals
- Technologies and Tools for Isolation, Enrichment, and Purification of Functional Ingredients from Different Starting Materials
  - 2.2.1. Chemical Properties
  - 2.2.2. Sensory Properties
- 2.3. Procedures and Equipment for the Incorporation of Functional Ingredients into the Base Feed
  - 2.3.1. Formulation of Functional Foods According to Their Chemical and Sensory Properties, Caloric Value, etc.
  - 2.3.2. Stabilization of Bioactive Ingredients from Formulation
  - 2.3.3. Dosage
- 2.4. Gastronomy Research
  - 2.4.1. Texture.
  - 2.4.2. Viscosity and Flavor: Thickeners Used in Nouvelle Cuisine
  - 2.4.3. Gelling Agents
  - 2.4.4. Emulsions
- 2.5. Innovation and New Trends in the Design of Functional Foods and Nutraceuticals
  - 2.5.1. Design of Functional Foods Aimed at Improving Specific Physiological Functions
  - 2.5.2. Practical Applications of Functional Food Design
- 2.6. Specific Formulation of Bioactive Compounds
  - 2.6.1. Flavonoid Transformation in the Formulation of Functional Foods
  - 2.6.2. Bioavailability Studies of Phenolic Compounds
  - 2.6.3. Antioxidants in the Formulation of Functional Foods
  - 2.6.4. Preservation of Antioxidant Stability in Functional Food Design
- 2.7. Design of Low-Sugar and Low-Fat Products
  - 2.7.1. Development of Low-Sugar Products
  - 2.7.2. Low-Fat Products
  - 2.7.3. Strategies for the Synthesis of Structured Lipids
- 2.8. Processes for the Development of New Food Ingredients
  - 2.8.1. Advanced Processes for Obtaining Food Ingredients with Industrial Application:
    Micronization and Microencapsulation Technologies

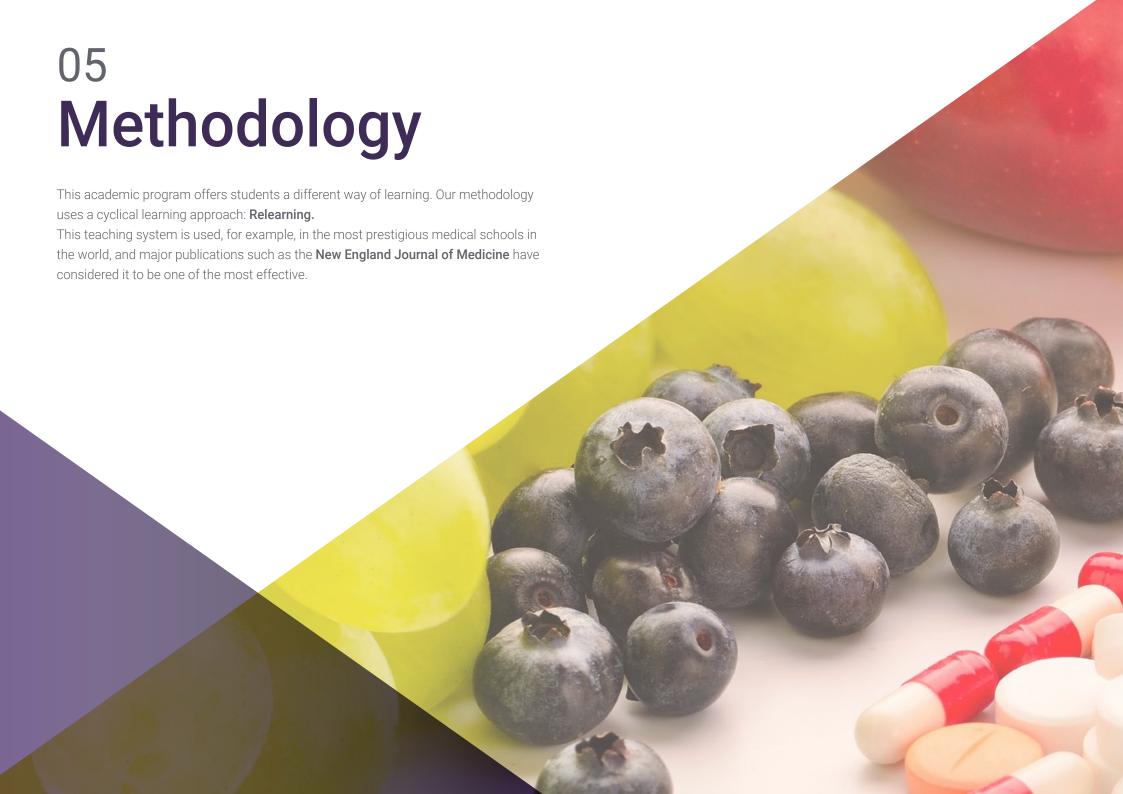
## Structure and Content | 21 tech

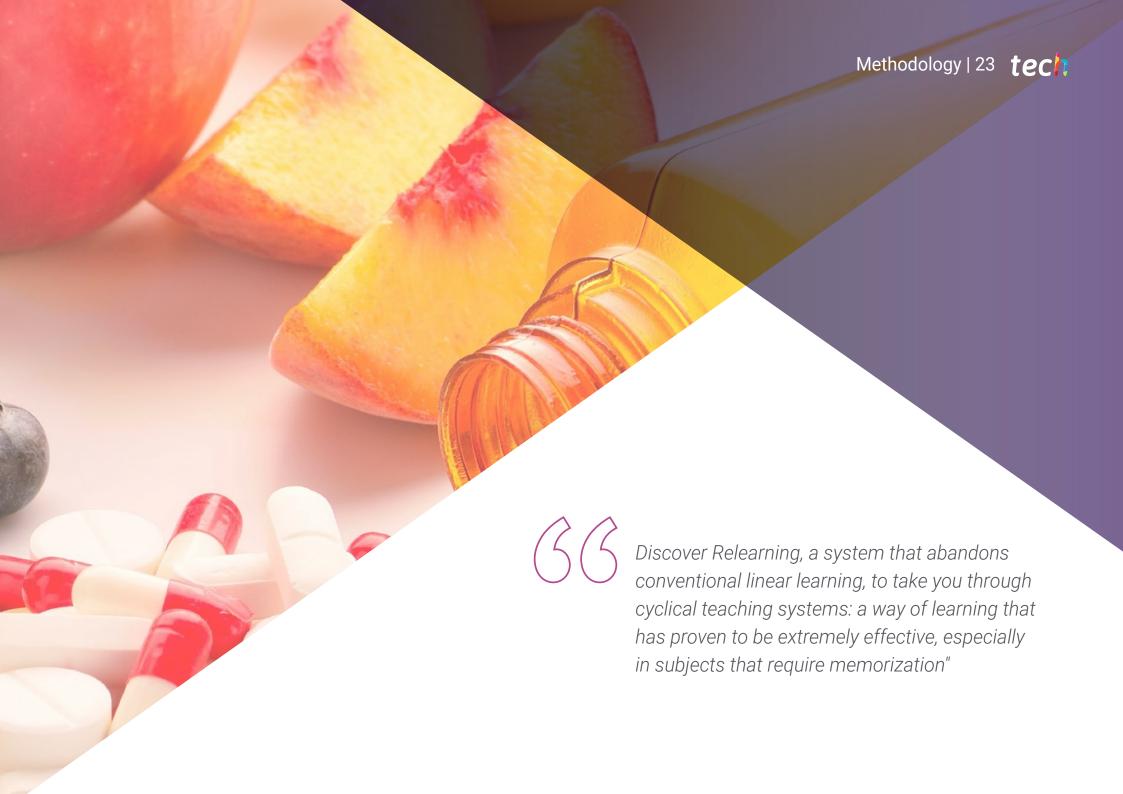
- 2.8.2. Supercritical and Clean Technologies
- 2.8.3. Enzymatic Technology for the Production of Novel Food Ingredients
- 2.8.4. Biotechnological Production of Novel Food Ingredients
- 2.9. New Food Ingredients of Plant and Animal Origin
  - 2.9.1. Trends in R&D&I Developments in New Ingredients
  - 2.9.2. Applications of Plant-Based Ingredients
  - 2.9.3. Applications of Ingredients of Animal Origin
- 2.10. Research and Improvement of Labeling and Preservation Systems
  - 2.10.1. Labeling Requirements
  - 2.10.2. New Conservation Systems
  - 2.10.3. Validation of Health Claims

#### Module 3. Development, Coordination and Execution of R&D&I Projects

- 3.1. Innovation and Competitiveness in the Food Industry
  - 3.1.1. Analysis of the Food Sector
  - 3.1.2. Innovation in Processes, Products and Management
  - 3.1.3. Regulatory Conditions for the Marketing of Novel Foods
- 3.2. The R&D System
  - 3.2.1. Public Investigation and Private Investigation
  - 3.2.2. Regional and Local Business Support Plans
  - 3.2.3. National R&D&I Plans
  - 3.2.4. International Programs
  - 3.2.5. Research Promotion Agencies
- 3.3. R&D&I Projects
  - 3.3.1. R&D&I Aid Programs
  - 3.3.2. Types of Projects
  - 3.3.3. Types of Financing
  - 3.3.4. Project Evaluation, Monitoring and Control
- 3.4. Scientific and Technological Production
  - 3.4.1. Publication, Dissemination and Diffusion of Research Results
  - 3.4.2. Basic Research/Applied Research

- 3.4.3. Private Sources of Information
- 3.5. Technology Transfer
  - 3.5.1. Protection of Industrial Property. Patents
  - 3.5.2. Regulatory Constraints on Transfers in the Food Sector.
  - 3.5.3. European Food Safety Authority (EFSA)
  - 3.5.4. Food and Drug Administration (FDA)
  - 3.5.5. National Organizations. Example: Spanish Agency for Food Safety and Nutrition (AESAN)
- 3.6. Planning of R&D&I Projects
  - 3.6.1. Work Decomposition Scheme
  - 3.6.2. Resource Allocation
  - 3.6.3. Priority of Tasks
  - 3.6.4. Gantt Chart Method
  - 3.6.5. Digitally Supported Planning Methods and Systems
- 3.7. Documentary Development of R&D&I Projects
  - 3.7.1. Prior Studies
  - 3.7.2. Delivery of Progress Reports
  - 3.7.3. Development of the Project Report
- 3.8. Project Execution
  - 3.8.1 Checklist
  - 3.8.2. Deliverables
  - 3.8.3. Project Progress Control
- 3.9. Project Delivery and Validation
  - 3.9.1. ISO Standards for the Management of R&D&I Projects
  - 3.9.2. Completion of the Project Phase
  - 3.9.3. Analysis of Results and Feasibility
- 3.10. R&D&I Projects Implementation
  - 3.10.1. Purchase Management
  - 3.10.2. Supplier Validation
  - 3.10.3. Project Validation and Verification



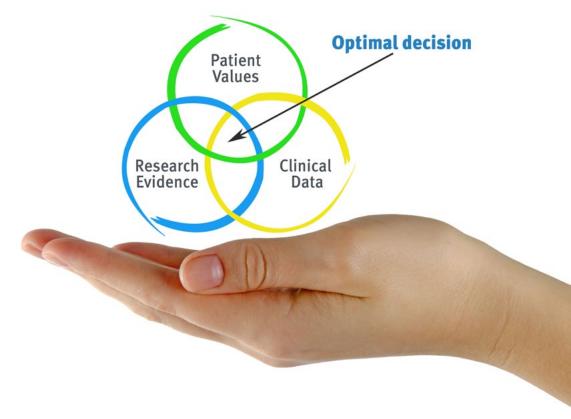


## tech 24 | Methodology

#### 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.



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:

- 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.



## tech 26 | Methodology

#### 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.



## Methodology | 27 tech

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 socioeconomic 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.

## tech 28 | Methodology

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**

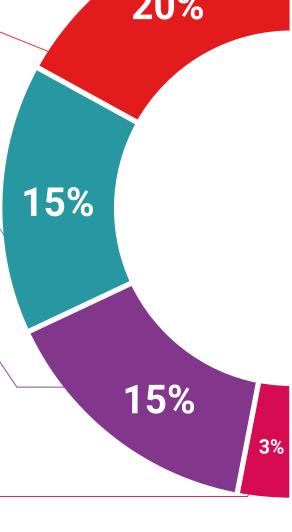
TECH brings students closer to the latest techniques, the latest educational advances and to the forefront of current nutritional counselling techniques and procedures. All of this in direct contact with students and explained in detail so as to aid their assimilation and understanding. And best of all,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





**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.





17%





## tech 32 | Certificate

This **Postgraduate Diploma in Analytical Techniques in R&D&I Project Quality Control** 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 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 Analytical Techniques in R&D&I Project Quality Control
Official Number of Hours: 450 h.



<sup>\*</sup>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.

technological university

## Postgraduate Diploma

Analytical Techniques in R&D&I Project Quality Control

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

