

# Postgraduate Diploma

## Nutrigenomics, Metabolomics and Epigenetics



## Postgraduate Diploma Nutrigenomics, Metabolomics and Epigenetics

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

Website: [www.techtute.com/pk/pharmacy/postgraduate-diploma/postgraduate-diploma-nutrigenomics-metabolomics-epigenetics](http://www.techtute.com/pk/pharmacy/postgraduate-diploma/postgraduate-diploma-nutrigenomics-metabolomics-epigenetics)

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# 01

# Introduction

Pharmacists play a fundamental role in health care. Their advice has great influence on the behavior of the public. For this reason, keeping up to date with the advances that genetics has incorporated in the nutritional field is of vital importance. This program offers specialized teaching of the highest quality that will allow you to work in this discipline with maximum confidence.



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*Pharmacists are the specialists who can best collaborate with physicians to offer advice to patients, especially in the area of nutrition, so it is essential that they are educated with this program"*

This Postgraduate Diploma covers everything a health professional needs to know about Nutritional Genomics and Precision Nutrition, taking into account aspects related to Nutrigenomics, Metabolomics and Epigenetics. Therefore, the material is organized in the best possible way, allowing the professional to acquire all the knowledge needed, without leaving them with doubts or information gaps. It is the best program on the market because it offers students the opportunity to learn all the innovation in the field of Nutritional Genomics, 100% online.

This program delves into the differences between Nutrigenetics and Nutrigenomics. Therefore, the similarities and differences are explained, and the main nutrition-related gene expression studies in humans are presented. In addition, the example of the Mediterranean diet as a dietary pattern is analyzed, and the studies of patterns and nutrients and their influence on the change of gene expression are explained.

On the other hand, the completion of this Postgraduate Diploma will help students to understand and delve into the principles of Metabolomics and Proteomics. Thus, the key techniques and the main applications that Metabolomics and Proteomics could have in the field of nutrition are explained. In this sense, this program presents the state-of-the-art microbiota data for its application and use in clinical practice towards a precise and more individualized patient treatment.

Finally, it also explores the basis of the relationship between Epigenetics and food, describing the differences between Epigenetics and Epigenomics, and presenting the scientific advances in these fields that are aligned with food, as well as how it can influence health and how it interacts with nutritional habits.

As it is an online program, the student is not restricted by fixed schedules or the need to move to another physical location, but can access the contents at any time of the day, balancing their work or personal life with their academic life as they wish.

This **Postgraduate Diploma in Nutrigenomics, Metabolomics and Epigenetics** 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 Nutritional Genomics and Precision Nutrition
- ◆ The graphic, schematic and eminently practical contents of the course are designed to provide all the essential information required for professional practice
- ◆ Practical exercises where self-assessment can be used to improve learning
- ◆ Special emphasis on innovative methodologies in Nutrigenomics, Metabolomics and Epigenetics
- ◆ 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



*Learn how genetics can favor the appearance of certain diseases and help your patients to prevent them"*

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*This Postgraduate Diploma is the best investment you can make when selecting a refresher program to update your knowledge in Nutrigenomics, Metabolomics and Epigenetics”*

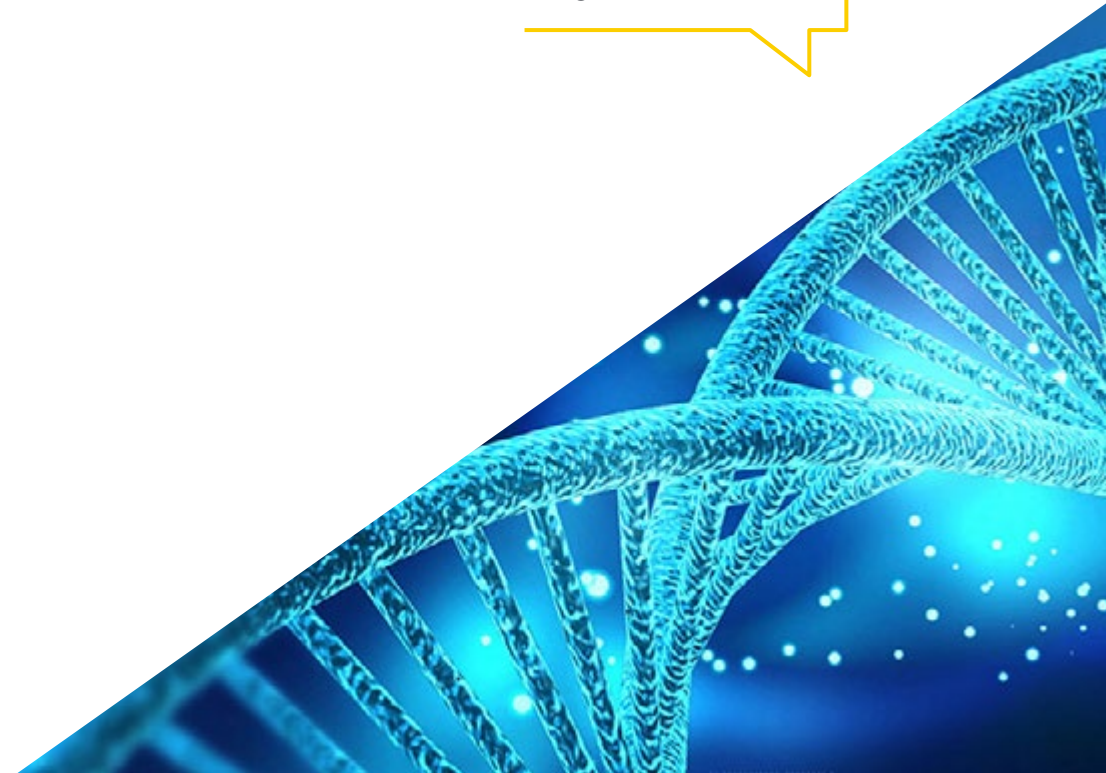
Its teaching staff includes professionals belonging to the field of nutrition, who contribute their work experience to this program, as well as renowned specialists from reference societies and prestigious universities.

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 an immersive program designed 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 academic year. To do so, the professional will be assisted by an innovative interactive video system created by renowned and experienced experts in Nutrigenomics, Metabolomics and Epigenetics.

*This Postgraduate Diploma offers teaching in simulated environments, which provides an immersive learning experience designed to prepare for real-life situations*

*This 100% online program will allow you to combine your studies with your professional work while increasing your knowledge in this field*



# 02

# Objectives

The main objective of the program is the development of theoretical and practical learning, so that the pharmacist can master the study of Nutrigenomics, Metabolomics and Epigenetics in a practical and rigorous way.





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*This refresher program will generate a sense of confidence in the performance of your daily practice, which will help you grow personally and professionally”*



## General Objectives

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- ◆ Acquire theoretical knowledge of human population genetics
- ◆ Acquire knowledge of Genomic and Precision Nutrition to be able to apply it in clinical practice
- ◆ Learn about the trajectory of this innovative field and the key studies that contributed to its development
- ◆ Know in which pathologies and conditions of human life Nutritional Genomics and Precision Nutrition can be applied
- ◆ Be able to assess individual response to nutrition and dietary patterns in order to promote health and disease prevention
- ◆ Learn how nutrition influences gene expression in humans
- ◆ Learn about new concepts and future trends in the field of Genomic and Precision Nutrition
- ◆ Adapt personalized dietary and lifestyle habits according to genetic polymorphisms
- ◆ Provide health professionals with all the up-to-date knowledge in the field of Genomic and Precision Nutrition in order to know how to apply it in their professional activity
- ◆ Put all the up-to-date knowledge into perspective. Where we are now and where we are headed so that the student can appreciate the ethical, economic and scientific implications in the field





## Specific Objectives

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### Module 1. Nutrigenomics

- ◆ Gain in-depth knowledge of the differences between nutrigenetics and nutrigenomics
- ◆ Present and analyze genes related to metabolic processes affected by nutrition

### Module 2. Metabolomics-Proteomics

- ◆ Know the principles of metabolomics and proteomics
- ◆ Gain in-depth knowledge of the microbiota as a tool for preventive and personalized nutrition

### Module 3. Epigenetics

- ◆ Explore the basis of the relationship between epigenetics and nutrition
- ◆ Present and analyze how micrnas are involved in genomic nutrition



*Realistic goals that will  
turn into immediate job  
progression"*

03

# Course Management

The program's faculty includes leading experts in Genomic and Precision Nutrition, who contribute their work experience to this program. Additionally, other recognized experts participate in its design and preparation, completing the program in an interdisciplinary manner.





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*The best professionals are at the best university.  
Don't hesitate any longer and join our community  
of students”*

## Management



### Dr. Konstantinidou, Valentini

- PhD in Biomedicine
- Lecturer in Nutrigenetics
- Founder of DNANUTRICOACH®
- Dietitian- Nutritionist
- Food Technologist

## Professors

### Dr. García Santamarina, Sarela

- ♦ PhD in Biomedical Research, Pompeu Fabra University, Barcelona, Spain, 2008-2013
- ♦ Master's Degree in Molecular Biology of Infectious Diseases, London School of Hygiene & Tropical Medicine, London, UK, 2006-2007
- ♦ Master's Degree in Biochemistry and Molecular Biology, Autonomous University of Barcelona, Spain, 2003-2004
- ♦ Degree in Chemistry Major in Organic Chemistry, University of Santiago de Compostela, Spain, 1996-2001
- ♦ Postdoctoral Researcher EIPOD Marie Curie. Mentoring: Dr. Athanasios Typas, Dr. Peer Bork, and Dr. Kiran Patil. Project: "Effects of drugs on intestinal flora". European Molecular Biology Laboratory (EMBL), Heidelberg, Germany. Since 2018

### Mr. Anglada, Roger

- ♦ Graduate in Multimedia, Catalunya Open University (Universitat Oberta de Catalunya)
- ♦ Senior Technician in Analysis and Control, Narcís Monturiol Institute of Secondary Education, Barcelona
- ♦ Senior research support technician at the Genomics Service of the Pompeu Fabra University where he is responsible for the equipment and devices for sequencing and real-time PCR, providing support to users from different centers both in the design and interpretation of the results
- ♦ Co-author of several scientific publications since 2002. He combines his work with lectures and teaching both at Pompeu Fabra University and in different programs and courses



04

# Structure and Content

The structure of the contents has been designed by a team of professionals who know about the implications of education in daily practice, who are aware of the current relevance of Nutritional Genomics and Precision Nutrition renovation and are committed to quality teaching through new educational technologies.







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*We have the most complete and up-to-date scientific program on the market. We strive for excellence and for you to achieve it too"*

## Module 1. Nutrigenomics

- 1.1. Differences and Similarities with Nutrigenetics
- 1.2. Bioactive Components of Diet on Gene Expression
- 1.3. The Effect of Micro and Macro Nutrients on Gene Expression
- 1.4. The Effect of Dietary Patterns on Gene Expression
  - 1.4.1. The Mediterranean Diet Example
- 1.5. Main Studies in Gene Expression
- 1.6. Genes Related to Inflammation
- 1.7. Genes Related to Insulin Sensitivity
- 1.8. Genes Related to Lipid Metabolism and Adipose Tissue Differentiation
- 1.9. Genes Related to Arteriosclerosis
- 1.10. Genes Related to the Myoskeletal System

## Module 2. Metabolomics-Proteomics

- 2.1. Proteomics
  - 2.1.1. Principles of Proteomics
  - 2.1.2. The Flow of Proteomics Analysis
- 2.2. Metabolomics
  - 2.2.1. Principles of Metabolomics
  - 2.2.2. Targeted Metabolomics
  - 2.2.3. Non-Targeted Metabolomics
- 2.3. The Microbiome/Microbiota
  - 2.3.1. Microbiome Data
  - 2.3.2. Human Microbiota Composition
  - 2.3.3. Enterotypes and Diet
- 2.4. Main Metabolomic Profiles
  - 2.4.1 Application to Disease Diagnosis
  - 2.4.2. Microbiota and Metabolic Syndrome
  - 2.4.3. Microbiota and Cardiovascular Diseases Effect of the Oral and Intestinal Microbiota
- 2.5. Microbiota and Neurodegenerative Diseases
  - 2.5.1. Alzheimer's Disease
  - 2.5.2. Parkinson's Disease
  - 2.5.3. ALS

- 2.6. Microbiota and Neuropsychiatric Diseases
  - 2.6.1. Schizophrenia
  - 2.6.2. Anxiety, Depression, Autism
- 2.7. Microbiota and Obesity
  - 2.7.1. Enterotypes
  - 2.7.2. Current Studies and State of Knowledge

## Module 3. Epigenetics

- 3.1. History of Epigenetics -The Way I Eat, Inheritance for My Grandchildren
- 3.2. Epigenetics vs. Epigenomics
- 3.3. Methylation
  - 3.3.1. Examples of Folate and Choline, Genistein
  - 3.3.2. Examples of Zinc, Selenium, Vitamin A, Protein Restriction
- 3.4. Histone Modification
  - 3.4.1. Examples of Butyrate, Isothiocyanates, Folate and Choline
  - 3.4.2. Examples of Retinoic Acid, Protein Restriction
- 3.5. MicroRNA
  - 3.5.1. Biogenesis of MicroRNAs in Humans
  - 3.5.2. Mechanisms of Action-Regulating Processes
- 3.6. Nutrimiromics
  - 3.6.1. Diet-Modulated MicroRNAs
  - 3.6.2. MicroRNAs involved in Metabolism
- 3.7. Role of MicroRNAs in Diseases
  - 3.7.1. MicroRNA in Tumorigenesis
  - 3.7.2. MicroRNAs in Obesity, Diabetes and Cardiovascular Diseases
- 3.8. Gene Variants that Generate or Destroy Binding Sites for MicroRNAs
  - 3.8.1. Main Studies
  - 3.8.2. Results in Human Diseases
- 3.9. MicroRNA Detection and Purification Methods
  - 3.9.1. Circulating MicroRNAs
  - 3.9.2. Basic Methods Used



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*A unique, key and decisive training experience to boost your professional development”*

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.





*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

What should a professional do in a given situation? Throughout the program, students will be confronted with multiple simulated clinical cases based on real patients, in which they will have to investigate, establish hypotheses and ultimately, resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Pharmacists learn better, more quickly and more sustainably over time.

*With TECH you will 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, attempting to recreate the actual conditions in a pharmacist's professional 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. Pharmacists who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their knowledge.
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
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 Harvard case method with the best 100% online teaching methodology available: Relearning.

Our 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, which represent a real revolution with respect to simply studying and analyzing cases.



*Pharmacists 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 115,000 pharmacists have been trained with unprecedented success in all clinical specialties, regardless of the surgical load. This pedagogical methodology is developed in a highly demanding environment, with a university student body with a high 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 specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to 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 created specifically for the course by specialist pharmacists who will be teaching the course, so that the didactic development is highly specific and accurate.

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.



### Video Techniques and Procedures

TECH introduces students to the latest techniques, to the latest educational advances, to the forefront of current pharmaceutical care procedures. All of this, first hand, explained in detail with precision to contribute to assimilation and a better understanding. And best of all, you can watch them as many times as you want.



### 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.

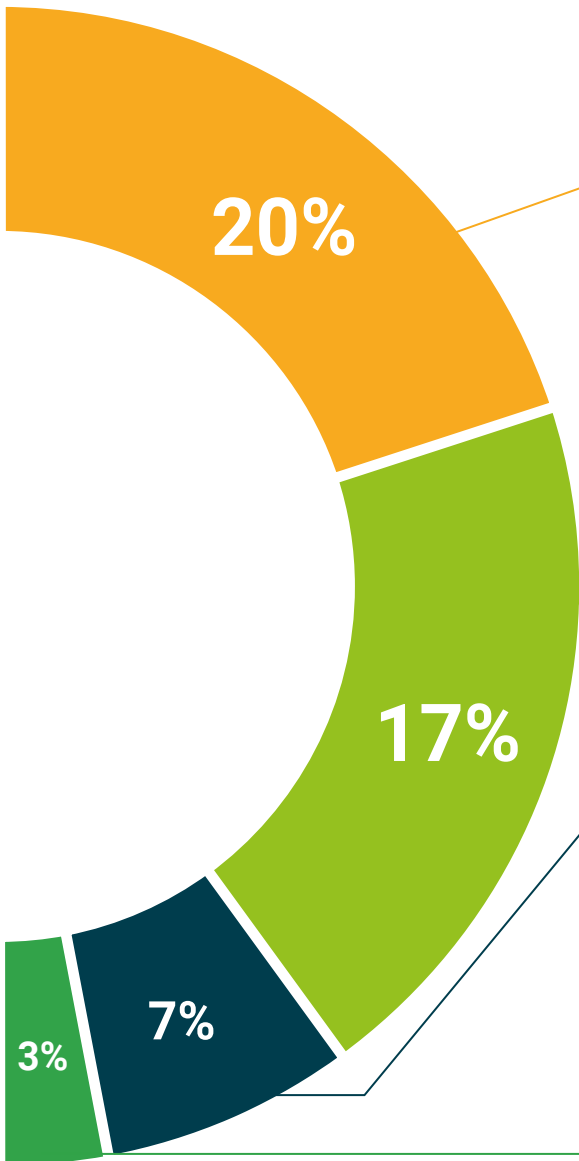
This unique multimedia content presentation training system was awarded by Microsoft as a "European Success Story".



### 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, we will present you with real case developments in which the expert will guide you through 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 on the usefulness of learning by observing experts: The system termed Learning from an Expert strengthens knowledge and recall capacity, and generates confidence in the face of difficult decisions in the future.



### 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.



06

# Certificate

The Postgraduate Diploma in Nutrigenomics, Metabolomics and Epigenetics 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 certificate without travel or cumbersome paperwork”*

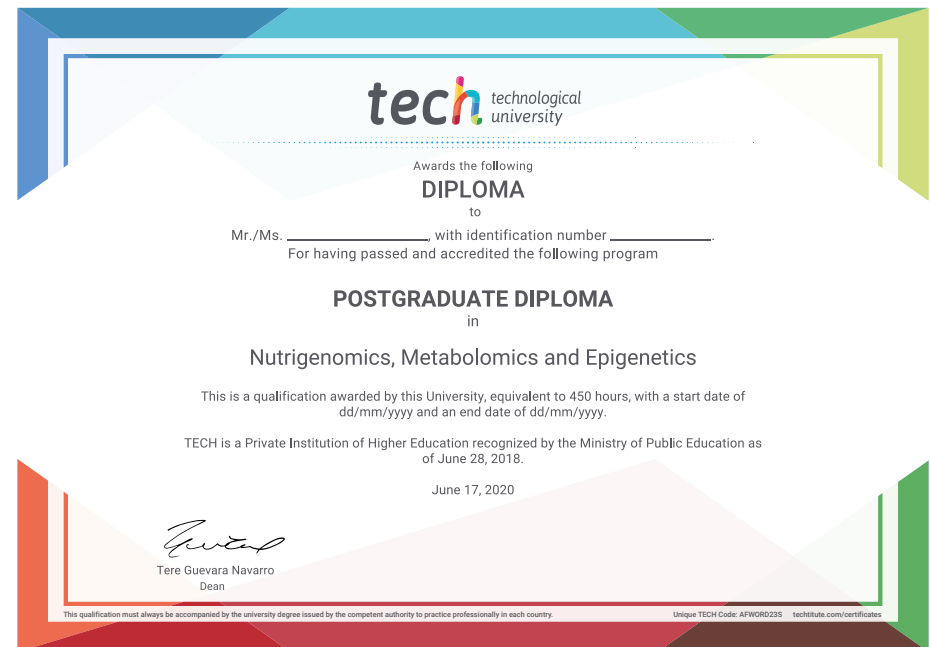
This **Postgraduate Diploma in Nutrigenomics, Metabolomics and Epigenetics** contains the most complete and up-to-date scientific program on the market.

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 Nutrigenomics, Metabolomics and Epigenetics**

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.

future  
health confidence people  
education information tutors  
guarantee accreditation teaching  
institutions technology learning  
community commitment  
personalized service innovation  
knowledge present  
online training  
development language  
classroom



**Postgraduate Diploma**  
Nutrigenomics,  
Metabolomics  
and Epigenetics

- » Modality: **online**
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