

# Hybrid Professional Master's Degree

Genomic and Precision Nutrition  
for Nursing



## Hybrid Professional Master's Degree

### Genomic and Precision Nutrition for Nursing

Modality: Hybrid (Online + Clinical Internship)

Duration: 12 months

Certificate: TECH Global University

60 + 5 ECTS Credits

Website: [www.techtute.com/us/nursing/hybrid-professional-master-degree/hybrid-professional-master-degree-genomic-precision-nutrition-nursing](http://www.techtute.com/us/nursing/hybrid-professional-master-degree/hybrid-professional-master-degree-genomic-precision-nutrition-nursing)

# Index

01

Introduction

---

*p. 4*

02

Why Study this Hybrid  
Professional Master's Degree?

---

*p. 8*

03

Objectives

---

*p. 12*

04

Skills

---

*p. 16*

05

Course Management

---

*p. 20*

06

Planning of teaching

---

*p. 26*

07

Clinical Internship

---

*p. 34*

08

Where Can I Do the Clinical  
Internship?

---

*p. 40*

09

Methodology

---

*p. 44*

10

Certificate

---

*p. 52*

# 01

# Introduction

The scientific and technological revolution has opened up new paths of work for nursing. The sequencing of human DNA has given rise to Precision Medicine and, consequently, to Genomic Nutrition, which provides the opportunity to prevent diseases with greater precision, such as hypertension. Therefore, nurses must always be up to date with the latest innovations in this discipline. In order to meet this need, TECH presents an innovative study modality that combines theoretical and practical knowledge. The program consists of an online learning phase, followed by a three-week face-to-face clinical stay at a renowned hospital, where you will be able to get up to speed with prestigious specialists in this area.



A blurred image of a microscope in the background, showing the objective lens and eyepiece. The image is partially obscured by a green geometric overlay on the right side of the page.

“

*Update your knowledge and care techniques in Genomic and Precision Nutrition through this program, which includes an intensive clinical stay in a reference health center”*

Genomic and Precision Nutrition has experienced great progress in recent years thanks to the numerous scientific and technological discoveries in this area. Currently, more effective dietary supplements and intervention and prevention strategies for diseases such as hypertension or type II diabetes have been developed based on the interaction of certain genes with specific nutrients. To apply these techniques and benefits efficiently, it is essential that nursing professionals possess the most up-to-date knowledge and skills in the field.

To respond to this context, TECH has created this Hybrid Professional Master's Degree that focuses on teaching the latest advances in Genomic and Precision Nutrition. The educational methodology used in this program is hybrid, combining theoretical and practical learning with a practical stay in a prestigious center. Therefore, the first part of the teaching is carried out on an interactive platform, 100% online, with valuable multimedia resources such as infographics and videos. In addition, innovative methodologies, such as *Relearning*, are used to facilitate the understanding of the most complex concepts.

After the theoretical phase, TECH offers a 120-hour clinical internship in a renowned hospital institution. During this period, students will apply the theoretical knowledge acquired on real patients and in the most complex clinical scenarios. To ensure the correct application of these techniques, an assistant tutor is assigned to provide support at all times. The practical stay lasts three weeks, with 8-hour workdays. At the end of the process, students will be ready to apply the main innovations of Genomic and Precision Nutrition in their daily nursing practice.

This **Hybrid Professional Master's Degree in Genomic and Precision Nutrition for Nursing** contains the most complete and up-to-date scientific program on the market. The most important features include:

- ♦ The development of more than 100 clinical cases presented by experts in Genomic and Precision Nutrition
- ♦ 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
- ♦ An algorithm-based interactive learning system for decision-making in the clinical situations presented throughout the course
- ♦ Clinical practice guidelines on the approach to the different pathologies from Genomic Nutrition
- ♦ All this will be complemented by 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
- ♦ In addition, you will be able to carry out a clinical internship in one of the best hospitals in the world



*Master the most advanced procedures in Genomic Nutrition thanks to this Advanced Master's Degree, with which you will be able to put into practice the latest techniques in nutritional counseling"*

“

*TECH has carefully selected the most prestigious training centers to enable you to train in a high-level clinical environment”*

In this Professional Master's Degree proposal, of a professionalizing nature and hybrid modality, the program is aimed at updating nursing professionals who require a high level of qualification. The content is based on the latest scientific evidence and is organized in a didactic way to integrate theoretical knowledge into nursing practice. The theoretical-practical elements allow professionals to update their knowledge and help them to make the right decisions in patient care.

Thanks to their multimedia content developed with the latest educational technology, they will allow the nursing professional to obtain situated and contextual learning, i.e., a simulated environment that will provide immersive learning programmed to train in real situations. This program is designed around Problem-Based Learning, whereby the physician must try to solve the different professional practice situations that arise during the course. For this purpose, it will be aided by an innovative interactive video system developed by renowned experts.

*Get up to date to be at the forefront of personalized health care, being able to design patient-specific nutritional plans.*

*The hybrid nature of this program will allow you to study at your own pace and in a 100% online format and then apply what you have learned in a prestigious center.*



02

# Why Study this Hybrid Professional Master's Degree?

In the field of nursing, the practical application of knowledge is essential for proper clinical performance. TECH recognizes this need and offers a Hybrid Professional Master's Degree program that combines online theoretical instruction with an immersive, face-to-face experience. This 1,620-hour program provides nursing professionals with the opportunity to acquire world-class practical skills and to manage the most innovative concepts and tools in the Genomic and Precision Nutrition market.





“

*Enroll and enjoy a unique opportunity  
for professional updating with TECH”*

### 1. Updating from the latest technology available

In recent years, clinical and laboratory research in Genomic and Precision Nutrition has undergone remarkable progress thanks to scientific and technological development. This program provides nurses with access to these innovative tools and gives them the ability to apply them in the diagnosis and treatment of their patients to improve their care.

### 2. Gaining In-Depth Knowledge from the Experience of Top Specialists

Throughout the study process, the nursing professional will be supported by experts and personalized tutors. During the theoretical phase, a prestigious teaching staff will be available to clarify doubts and provide support in the understanding of key concepts. In the second half of the program, the adjunct tutor will be in charge of supervising and guiding the student in his or her learning process.

### 3. Entering First-Class Clinical Environments

TECH carefully selects all available centers for Internship Programs. Thanks to this, the professional will have guaranteed access to a prestigious clinical environment in the area of Genomic Nutrition. In this way, you will be able to see the day-to-day work of a demanding, rigorous and exhaustive sector, always applying the latest theses and scientific postulates in its work methodology.



#### 4. Combining the Best Theory with State-of-the-Art Practice

In order to obtain a complete professional update in Genomic and Precision Nutrition, TECH has developed an academic program that combines theory and practice. The focus is on an intensive, face-to-face experience that allows nursing professionals to be fully immersed in the discipline, providing them with an immediate, comprehensive and updated education in the field.

#### 5. Expanding the Boundaries of Knowledge

TECH offers the possibility of doing this Internship Program, not only in national, but also in international centers. This way, nurses will be able to expand their frontiers and catch up with the best professionals, who practice in first class centers and in different continents. A unique opportunity that only TECH, the largest online university in the world, could offer.

“

*You will have full practical immersion  
at the center of your choice”*

# 03

## Objectives

With the in-depth knowledge of genomics, nursing professionals can design personalized nutritional plans tailored to the needs of each patient. In addition, Genomic Nutrition can also be useful to prevent chronic diseases and improve quality of life. For that reason, the nurse must be aware of the latest advances in this area, so the main objective of this program is to allow the student to be completely updated in the discipline.



“

*You will acquire the most up to date knowledge in Genomic and Precision Nutrition and learn how to apply it in your daily work as a nursing professional"*



### General Objective

---

- The main objective of this Hybrid Professional Master's Degree is that the student acquires first level competencies and is updated in the most innovative assistance techniques in the area of Genomic Nutrition. In this way, the nurse will be able to apply theoretical and practical knowledge in their daily clinical practice, integrating the most advanced procedures into their clinical practice



*Thanks to TECH, you will acquire the latest skills and knowledge to assist in adapting the diet and lifestyles of your patients in a personalized way according to their genetic polymorphisms”*





## Specific Objectives

---

### Module 1. Introduction Nutritional Genomics and Precision Nutrition

- ♦ To present definitions necessary to follow the thread of the following modules
- ♦ To explain relevant points of human DNA, nutritional epidemiology, scientific method
- ♦ To analyze key studies in Genomic Nutrition

### Module 2. Laboratory Techniques for Nutritional Genomics

- ♦ To understand the techniques used in Nutritional Genomics Studies
- ♦ To acquire the latest advances in omics and bioinformatics techniques

### Module 3. Biostatistics for Genomic Nutrition

- ♦ To acquire the necessary knowledge to correctly design experimental studies in the fields of nutrigenomics and nutrigenetics
- ♦ To delve into statistical models for clinical studies in humans

### Module 4. Nutrigenetics I

- ♦ To acquire the latest knowledge on population genetics
- ♦ To understand how the basis for the interaction between genetic variability and diet is generated
- ♦ To introducing the advanced Circadian Control System and Central and Peripheral Clocks

### Module 5. Nutrigenetics II - Key Polymorphisms

- ♦ To present the Key Polymorphisms to date related to Human Nutrition and Metabolic Processes that the Professional needs to know about
- ♦ To analyze the key studies that support these polymorphisms and the debate, where it exists

### Module 6. Nutrigenetics III

- ♦ To present the key polymorphisms to date related to complex diseases that are with complex diseases that depend on nutritional habits
- ♦ To introduce new Advanced Concepts in Nutrigenetic Research

### Module 7. Nutrigenomics

- ♦ To deepen in the Differences between Nutrigenetics and Nutrigenomics
- ♦ To present and analyze genes related to metabolic processes affected by Nutrition

### Module 8. Metabolomics-Proteomics

- ♦ To know the Principles of Metabolomics and Proteomics
- ♦ To delve into microbiota as a tool for preventive and personalized nutrition

### Module 9. Epigenetics

- ♦ To explore the fundamentals of the relationship between epigenetics and nutrition
- ♦ To present and Analyze how MicroRNAs are Involved in Genomic Nutrition

### Module 10. Current Market State

- ♦ To present and analyze key aspects for the application of Nutritional Genomics in society
- ♦ To reflect on and analyze past and present cases and anticipate future market developments in the field of Nutritional Genomics

# 04 Skills

Through a hybrid methodology, nursing professionals will get a complete update on the fundamentals of genomic and precision nutrition, and learn how to apply the knowledge acquired in clinical practice. At the end of the program, students will have developed advanced skills in analyzing genomic data and developing personalized nutritional plans based on their patients' genetic information.





“

*Update your knowledge on the use of microbiota as a tool for preventive and personalized nutrition thanks to the innovative contents offered by this academic program”*



## General Skills

---

- Conduct individual reflective work on new Nutrigenetics and Precision Nutrition data
- Study and evaluate current controversial issues on this subject
- Evaluate and use commercially available Genomic and Precision Nutrition tools in their clinical practice

“

*This program will enable you to develop the necessary competencies to update your professional practice with the latest scientific and technological evidence”*





## Specific Skills

---

- ♦ Distinguishing between Nutrigenetics and Nutrigenomics
- ♦ Possess and understand original knowledge within the broader context of nutrition
- ♦ Apply critical, logical and scientific thinking to nutritional recommendations
- ♦ Understand the global context of Genomic and Precision Nutrition
- ♦ In-depth knowledge of all fields of Genomic and Precision Nutrition, its history and future applications
- ♦ Acquire the latest advances in nutritional research
- ♦ Know the strategies used in research to identify the loci and genetic variants studied by Nutrigenetics
- ♦ Know how the advances in Genomic Nutrition were generated and what skills are necessary to keep constantly updated
- ♦ Formulate new hypotheses and work in an inter-disciplinary manner
- ♦ Integrate knowledge and deal with the complexity of data, evaluate relevant literature to incorporate scientific advances into your own professional field
- ♦ Understand how the scientific knowledge of Nutrigenetics and Nutrigenomics is translated and applied to clinical use in today's society
- ♦ Apply knowledge of Nutritional Genomics for health promotion
- ♦ Know the theory of basic laboratory techniques used in genomic nutrition
- ♦ Know the basis of statistical analyses used in nutritional genomics
- ♦ Know the current state of the market in the field of nutritional genomics
- ♦ Know the trends in the field of nutritional genomics
- ♦ Understand the process of discovering new Genetic Nutrition data and the process of evaluating it prior to use
- ♦ Delve into the analysis of different types of studies in genetic epidemiology in order to be able to perform an adequate interpretation of the articles published in this field and identify the limitations of each type of study



*You will combine theory and professional practice through a demanding and rewarding educational approach”*

05

# Course Management

The teaching staff of this Hybrid Professional Master's Degree is composed of renowned experts in the field of nutrigenomics and nutrigenetics. Each of them has an extensive academic and professional background, and contributes their experience and knowledge to the professional updating of the students. In this way, nurses will have the opportunity to catch up with the best experts and obtain first-rate learning in this cutting-edge field.



“

*Leading professionals in the field of Genomic Nutrition will provide you with the most relevant technological and scientific advances in this field”*

## International Guest Director

Dr. Caroline Stokes is a specialist in Psychology and Nutrition, with a doctorate and a habilitation in Medical Nutrition. After a distinguished career in this field, she leads the Food and Health Research group at the Humboldt University of Berlin. This team collaborates with the Department of Molecular Toxicology at the German Institute of Human Nutrition Potsdam-Rehbrücke. Previously, he has worked at the Medical School of Saarland University in Germany, the Cambridge Medical Research Council and the UK National Health Service.

One of her goals is to discover more about the fundamental role that Nutrition plays in improving the overall health of the population. To this end, he has focused on elucidating the effects of fat-soluble vitamins such as A, D, E and K, the amino acid methionine, lipids such as omega-3 fatty acids and probiotics for both the prevention and treatment of diseases, particularly those related to hepatology, neuropsychiatry and aging.

Her other lines of research have focused on plant-based diets for the prevention and treatment of diseases, including liver and psychiatric diseases. He has also studied the spectrum of vitamin D metabolites in health and disease. She has also participated in projects to analyze new sources of vitamin D in plants and to compare the luminal and mucosal microbiome.

In addition, Dr. Caroline Stokes has published a long list of scientific papers. Some of her areas of expertise are Weight Loss, Microbiota and Probiotics, among others. The outstanding results of her research and her constant commitment to her work have led her to win the National Health Service Journal Award for the Nutrition and Mental Health Program in the UK.



## Dr. Caroline Stokes

---

- Head of the Food and Health Research Group at the Humboldt University of Berlin, Germany
- Researcher at the German Institute of Human Nutrition Potsdam-Rehbruecke
- Professor of Food and Health at the Humboldt University of Berlin
- Scientist in Clinical Nutrition at the University of Saarland
- Nutrition Consultant at Pfizer
- PhD in Nutrition at the University of Saarland
- Postgraduate Diploma in Dietetics at King's College London, University of London
- Master's Degree in Human Nutrition from the University of Sheffield

“

*Thanks to TECH you  
will be able to learn with  
the best professionals  
in the world”.*

Director



**Dr. Konstantinidou, Valentini**

- Dietitian-Nutritionist Specialist in Nutrigenetics and Nutrigenomics
- Founder of DNANutricoach
- Creator of the Food Coaching method to change eating habits
- Lecturer in Nutrigenetics
- PhD in Biomedicine
- Dietitian- Nutritionist
- Food Technologist
- Accredited Life Coach of the British body IPAC&M
- Member of: American Society of Nutrition





## Professors

### Mr. Anglada, Roger

- ◆ Research Support Technician at the Genomics Service of UPF
- ◆ Senior Research Support Technician at the Genomics Service of Pompeu Fabra University
- ◆ Senior Technician in Analysis and Control. Narcís Monturiol HSI, Barcelona
- ◆ Co-author of several scientific publications
- ◆ Graduate in Multimedia, Catalunya Open University

### Dr. García Santamarina, Sarela

- ◆ Group Leader at the Institute of Chemical and Biological Technology of the New University of Lisbon
- ◆ Postdoctoral Researcher EIPOD Marie Curie by: Effects of Drugs on Intestinal Flora, at the European Molecular Biology Laboratory (EMBL) in Heidelberg, Germany
- ◆ Postdoctoral Researcher for: Mechanisms of Copper Homeostasis in the Interaction between the Fungal Pathogen *Cryptococcus Neoformans* and the Host, Duke University, USA. A
- ◆ PhD in Biomedical Research from the Pompeu Fabra University of Barcelona
- ◆ Degree in Chemistry with a major in Organic Chemistry from the University of Santiago de Compostela
- ◆ Professional Master's degree in Molecular Biology of Infectious Diseases from the London School of Hygiene & Tropical Medicine in London
- ◆ Professional Master's Degree in Biochemistry and Molecular Biology from the Autonomous University of Barcelona

# 06

## Educational Plan

This program has a complete syllabus focused on the study of the most innovative and updated tools in the field of Genomic and Precision Nutrition. Throughout the program, students will have access to high-level theoretical and practical knowledge that will enable them to acquire up-to-date skills in the application of these tools in their daily practice.





“

*You are looking at the most comprehensive syllabus on Genomic and Precision Nutrition oriented to Nursing. Enroll now”*

## Module 1. Introduction to Nutritional Genomics and Precision Nutrition

- 1.1. Human Genome
  - 1.1.1. DNA Discovery
  - 1.1.2. Year 2001
  - 1.1.3. Human Genome Project
- 1.2. Variations of Interest in Nutrition
  - 1.2.1. Genomic Variations and the Search for Disease Genes
  - 1.2.2. Environment vs. Genetic Factor and Heritability
  - 1.2.3. Differences between SNPs, Mutations and CNVs
- 1.3. The Genome of Rare and Complex Diseases
  - 1.3.1. Examples of Rare Diseases
  - 1.3.2. Examples of Complex Diseases
  - 1.3.3. Genotype and Phenotype
- 1.4. Precision Medicine
  - 1.4.1. Influence of Genetics and Environmental Factors on Complex Diseases
  - 1.4.2. Need for Precision The problem of Missing Heritability Concept of Interaction
- 1.5. Precision Nutrition vs. Community Nutrition
  - 1.5.1. The Principles of Nutritional Epidemiology
  - 1.5.2. Current Bases of Nutritional Research
  - 1.5.3. Experimental Designs in Precision Nutrition
- 1.6. Levels of Scientific Evidence
  - 1.6.1. Epidemiological Pyramid
  - 1.6.2. Regulation
  - 1.6.3. Official Guides
- 1.7. Consortia and Major Studies in Human Nutrition and Genomic Nutrition
  - 1.7.1. Precision4Health Project
  - 1.7.2. Framingham
  - 1.7.3. PREDIMED
  - 1.7.4. CORDIOPREV
- 1.8. Current European Studies
  - 1.8.1. PREDIMED Plus
  - 1.8.2. NU-AGE
  - 1.8.3. FOOD4me
  - 1.8.4. EPIC



**Module 2. Laboratory Techniques for Nutritional Genomics**

- 2.1. Molecular Biology Laboratory
  - 2.1.1. Basic Instructions
  - 2.1.2. Basic Material
  - 2.1.3. Accreditations Required in the U.S.
- 2.2. DNA Extraction
  - 2.2.1. From Saliva
  - 2.2.2. From Blood
  - 2.2.3. From Other Fabrics
- 2.3. Real-Time PCR
  - 2.3.1. Introduction - History of the Method
  - 2.3.2. Basic Protocols Used
  - 2.3.3. Most Used Equipment
- 2.4. Sequencing
  - 2.4.1. Introduction - History of the Method
  - 2.4.2. Basic Protocols Used
  - 2.4.3. Most Used Equipment
- 2.5. High-throughput
  - 2.5.1. Introduction - History of the Method
  - 2.5.2. Examples of Human Studies
- 2.6. Gene Expression - Genomics - Transcriptomics
  - 2.6.1. Introduction - History of the Method
  - 2.6.2. Microarrays
  - 2.6.3. Microfluidic Cards
  - 2.6.4. Examples of Human Studies
- 2.7. Omics Technologies and their Biomarkers
  - 2.7.1. Epigenomics
  - 2.7.2. Proteomics
  - 2.7.3. Metabolomics
  - 2.7.4. Metagenomics
- 2.8. Bioinformatics Analysis
  - 2.8.1. Pre- and Post-Computing Bioinformatics Programs and Tools
  - 2.8.2. GO Terms, Clustering of DNA Microarray Data
  - 2.8.3. Functional Enrichment, GEPAS, Babelomics

### Module 3. Biostatistics for Genomic Nutrition

- 3.1. Biostatistics
  - 3.1.1. Human Studies Methodology
  - 3.1.2. Introduction to Experimental Design
  - 3.1.3. Estudios clínicos
- 3.2. Statistical Aspects of a Protocol
  - 3.2.1. Introduction, Objectives, Description of Variables
  - 3.2.2. Quantitative Variables
  - 3.2.3. Qualitative Variables
- 3.3. Design of Clinical Studies in Humans, Methodological Guidelines
  - 3.3.1. Designs with 2 treatments 2x2
  - 3.3.2. Designs with 3 treatments 3x3
  - 3.3.3. Parallel, Cross-Over, Adaptive Design
  - 3.3.4. Sample Size Determination and Power Analysis
- 3.4. Evaluation of Treatment Effect
  - 3.4.1. For Parallel Design, for Repeated Measurements, for Cross-Over Design
  - 3.4.2. Randomization of the Order of Treatment Assignment
  - 3.4.3. Carry-Over Effect (Wash Out)
- 3.5. Descriptive Statistics, Hypothesis Testing, Risk Calculation
  - 3.5.1. Consort, Populations
  - 3.5.2. Study Populations
  - 3.5.3. Grupo control
  - 3.5.4. Subgroup Analysis Types of Studies
- 3.6. Statistical Errors
  - 3.6.1. Measurement Errors
  - 3.6.2. Random Error
  - 3.6.3. Systematic Error
- 3.7. Statistical Bias
  - 3.7.1. Selection Bias
  - 3.7.2. Observation Bias
  - 3.7.3. Sesgo de asignación

- 3.8. Statistical Modeling
  - 3.8.1. Continuous Variable Models
  - 3.8.2. Categorical Variables Models
  - 3.8.3. Linear Mixed Models
  - 3.8.4. Missing data, Flow of Participants, Presentation of Results
  - 3.8.5. Adjustment for Baseline Values, Transformation of Response Variable: Differences, Ratios, Logarithms, Carry-Over Evaluation
- 3.9. Statistical Modeling with Co-Variables
  - 3.9.1. ANCOVA
  - 3.9.2. Logistic Regression for Binary and Count Variables
  - 3.9.3. Multi-Variant Analysis
- 3.10. Statistical Programs
  - 3.10.1. The R
  - 3.10.2. SPSS

### Module 4. Nutrigenetics I

- 4.1. Nutrigenetics Authorities and Organizations
  - 4.1.1. NUGO
  - 4.1.2. ISNN
  - 4.1.3. Evaluation Committees
- 4.2. GWAS I Studies
  - 4.2.1. Population Genetics - Design and Use
  - 4.2.2. Hardy-Weinberg Law
  - 4.2.3. Linkage Imbalance
- 4.3. GWAS II
  - 4.3.1. Allelic and Genotypic Frequencies
  - 4.3.2. Gene-Disease Association Studies
  - 4.3.3. Association Models ( Dominant, Recessive, Co-dominant)
  - 4.3.4. Genetic Scores
- 4.4. The Discovery of Nutrition-Related SNPs
  - 4.4.1. Key Studies-Design
  - 4.4.2. Main Results

- 4.5. The Discovery of SNPs Associated with Nutrition-Related Diseases (Diet-Depended)
  - 4.5.1. Cardiovascular Diseases.
  - 4.5.2. Diabetes Mellitus Type II
  - 4.5.3. Metabolic Syndrome
- 4.6. Main Obesity-Related GWAS
  - 4.6.1. Strengths and Weaknesses
  - 4.6.2. The FTO Example
- 4.7. Circadian Control of Intake
  - 4.7.1. Gut-Brain Axis
  - 4.7.2. Molecular and Neurological Basis of the Brain-Gut Connection
- 4.8. Chronobiology and Nutrition
  - 4.8.1. Central Clock
  - 4.8.2. Peripheral Clocks
  - 4.8.3. Circadian Rhythm Hormones
  - 4.8.4. Intake Control (Leptin and Ghrelin)
- 4.9. SNPs Related to Circadian Rhythms
  - 4.9.1. Regulatory Mechanisms of Satiety
  - 4.9.2. Hormones and Intake Control
  - 4.9.3. Possible Pathways Involved

## Module 5. Nutrigenetics II - Key Polymorphisms

- 5.1. Obesity-Related SNPs
  - 5.1.1. The Tale of the Obese Monkey
  - 5.1.2. Appetite Hormones
  - 5.1.3. Thermogenesis
- 5.2. Vitamin-Related SNPs
  - 5.2.1. Vitamin D
  - 5.2.2. B Complex Vitamins
  - 5.2.3. Vitamin E
- 5.3. Exercise-Related SNPs
  - 5.3.1. Strength vs. Competition
  - 5.3.2. Sports Performance
  - 5.3.3. Injury Prevention/Recovery

- 5.4. Oxidative Stress/Detoxification-related SNPs
  - 5.4.1. Genes Encoding Enzymes
  - 5.4.2. Anti-Inflammatory Processes
  - 5.4.3. Phase I+II of Detoxification
- 5.5. SNP related to Addictions
  - 5.5.1. Caffeine
  - 5.5.2. Alcohol
  - 5.5.3. Salt
- 5.6. SNP related to Flavor
  - 5.6.1. Sweet Taste
  - 5.6.2. Salty Taste
  - 5.6.3. Bitter Taste
  - 5.6.4. Acid Taste
- 5.7. SNP vs Allergies vs Intolerances
  - 5.7.1. Lactose
  - 5.7.2. Gluten
  - 5.7.3. Fructose
- 5.8. PESA Study

## Module 6. Nutrigenetics III

- 6.1. SNPs Predisposing to Complex Nutrition-Related Diseases - Genetic Risk Scores (GRS)
- 6.2. Type II Diabetes
- 6.3. Hypertension
- 6.4. Arteriosclerosis
- 6.5. Hyperlipidemia
- 6.6. Cancer
- 6.7. The Exposome Concept
- 6.8. Metabolic Flexibility Concept
- 6.9. Current Studies-Challenges for the Future

## Module 7. Nutrigenomics

- 7.1. Differences and Similarities with Nutrigenetics
- 7.2. Bioactive Components of Diet on Gene Expression
- 7.3. The Effect of Micro and Macro Nutrients on Gene Expression
- 7.4. The Effect of Dietary Patterns on Gene Expression
  - 7.4.1. The Mediterranean Diet Example
- 7.5. Main Studies in Gene Expression
- 7.6. Genes Related to Inflammation
- 7.7. Genes Related to Insulin Sensitivity
- 7.8. Genes related to Lipid Metabolism and Adipose Tissue Differentiation
- 7.9. Genes Related to Arteriosclerosis
- 7.10. Genes Related to the Myoskeletal System

## Module 8. Metabolomics-Proteomics

- 8.1. Proteomics
  - 8.1.1. Principles of Proteomics
  - 8.1.2. The Flow of Proteomics Analysis
- 8.2. Metabolomics
  - 8.2.1. Principles of Metabolomics
  - 8.2.2. Targeted Metabolomics
  - 8.2.3. Non-Targeted Metabolomics
- 8.3. The Microbiome/Microbiota
  - 8.3.1. Microbiome Data
  - 8.3.2. Human Microbiota Composition
  - 8.3.3. Enterotypes and Diet
- 8.4. Main Metabolomic Profiles
  - 8.4.1. Application to Disease Diagnosis
  - 8.4.2. Microbiota and Metabolic Syndrome
  - 8.4.3. Microbiota and Cardiovascular Diseases Effect of the Oral and Intestinal Microbiota
- 8.5. Microbiota and Neurodegenerative Diseases
  - 8.5.1. Alzheimer's Disease
  - 8.5.2. Parkinson's Disease
  - 8.5.3. ALS

- 8.6. Microbiota and Neuropsychiatric Diseases
  - 8.6.1. Schizophrenia.
  - 8.6.2. Anxiety, Depression, Autism
- 8.7. Microbiota and Obesity
  - 8.7.1. Enterotypes
  - 8.7.2. Current Studies and State of Knowledge

## Module 9. Epigenetics

- 9.1. History of Epigenetics - The Way I Eat and Inheritance for My Grandchildren
- 9.2. Epigenetics vs Epigenomics
- 9.3. Methylation
  - 9.3.1. Examples of Folate and Choline, Genistein
  - 9.3.2. Examples of Zinc, Selenium, Vitamin A, Protein Restriction
- 9.4. Histone Modification
  - 9.4.1. Examples of Butyrate, Isothiocyanates, Folate and Choline
  - 9.4.2. Examples of Retinoic Acid, Protein Restriction
- 9.5. MicroRNA
  - 9.5.1. Biogenesis of MicroRNAs in Humans
  - 9.5.2. Mechanisms of Action-Regulating Processes
- 9.6. Nutriniromics
  - 9.6.1. Diet-Modulated MicroRNAs
  - 9.6.2. MicroRNAs involved in Metabolism
- 9.7. Role of MicroRNAs in Diseases
  - 9.7.1. MicroRNA in Tumorigenesis
  - 9.7.2. MicroRNAs in Obesity, Diabetes and Cardiovascular Diseases
- 9.8. Gene Variants that Generate or Destroy Binding Sites for MicroRNAs
  - 9.8.1. Main Studies
  - 9.8.2. Results in Human Diseases
- 9.9. MicroRNA Detection and Purification Methods
  - 9.9.1. Circulating MicroRNAs
  - 9.9.2. Basic Methods Used



## Module 10. Current Market State

- 10.1. Legal Aspects
- 10.2. DTC (Direct-to-Consumer) Tests
  - 10.2.1. Pros and Cons
  - 10.2.2. Myths of Early DTCs
- 10.3. Quality Criteria for a Nutrigenetic Test
  - 10.3.1. SNP Selection
  - 10.3.2. Interpretation of Results
  - 10.3.3. Laboratory Accreditations
- 10.4. Health Professionals
  - 10.4.1. Training Needs
  - 10.4.2. Criteria of Professionals Applying Genomic Nutrition
- 10.5. Nutrigenomics in the Media
- 10.6. Integration of Evidence for Personalized Nutritional Counseling
- 10.7. Critical Analysis of the Current Situation
- 10.8. Discussion Work
- 10.9. Conclusions, use of Genomic and Precision Nutrition as Prevention

“

*Progress professionally by becoming an expert in Genomic Nutrition and applying the most advanced care techniques”*

07

# Clinical Internship

This degree offers professionals a complete update in the competencies needed to apply the latest advances in Genomic and Precision Nutrition in their daily clinical practice. With a teaching team of experts in the field, the program's agenda focuses on deepening the most innovative concepts and tools in this area, with special emphasis on the latest procedures in the discipline.



“

*Take a practical and intensive internship in a reference health center and integrate in your daily work the most advanced care protocols in Genomic Nutrition”*

During the Internship Program of this Genomic and Precision Nutrition for Nursing program, students will have the opportunity to perform a clinical internship in a referral hospital. The internship will last 3 weeks and will be carried out from Monday to Friday, with 8-hour working days with an assistant specialist. During this period, students will be able to apply innovative diagnostic procedures and plan state-of-the-art therapeutics for each pathology.

The internship will be carried out with the active participation of the student performing the activities and procedures of each area of competence (learning to learn and learning to do), with the accompaniment and guidance of teachers and other training partners that facilitate teamwork and multidisciplinary integration as transversal competencies for Nurses praxis (learning to be and learning to relate).

The procedures described below will form the basis of the practical part of the training, and their implementation is subject to both the suitability of the patients and the availability of the center and its workload, with the proposed activities being as follows:





Module	Practical Activity
<b>Techniques Advanced Laboratory Techniques in Genomic and Precision Nutrition</b>	Assist in the extraction and sequencing of DNA from patients with severe metabolic conditions or nutrient absorption problems to evaluate their causes
	Introduce omics technologies and their biomarkers to study the metabolic behavior of patients with nutritional requirements
	Use Microfluidic Cards to channel and address DNA microarrays in search of gene or genomic expression of a nutritional condition
	Correctly interpret and analyze biostatistical results collected in genetic analysis of patients with special nutritional requirements for genetic analysis of patients with special nutritional requirements in order to make the best medical making better medical decisions
<b>New perspectives on Nutrigenomics</b>	Assist in promoting the interaction of specific genes with different nutritional elements
	To generate and monitor changes in cellular metabolism and metabolic profiles, aimed at preventing, alleviating and/or improving the prognosis of different diseases in which the nutritional factor is an important element in their etiopathogenesis
	Develop individualized dietary recommendations in order to increase the effectiveness of nutritional plans
<b>Nutrigenetics and its main advances</b>	Examine the specific polymorphisms that anticipate the patient's possible obesity and act on them
	Identify genes that express addiction conditioning and address them through individualized strategies for each patient
	To recognize the genetic polymorphisms related to Type II Diabetes and to establish a specific diet and life habits in the patient against this disease
	Verify the genes that show evidence of a food allergy or intolerance and influence the patient to consciously avoid ingesting it
<b>Advanced products that support Precision Nutrition</b>	To assist in the indication to patients with vitamin deficiencies of algae-based antioxidant supplements, which demonstrate similar biological functions to vitamin E
	Understand how specific foods have changed the patient's gene expression, as in the case of higher salt intake in patients with early onset hypertension
	Detect new nutrients with similar benefits to other frequently ingested nutrients
	Predicting responses to new nutrients or foods from patients with specific dietary pathologies

## Civil Liability Insurance

This institution's main concern is to guarantee the safety of the trainees and other collaborating agents involved in the internship process at the company. Among the measures dedicated to achieve this is the response to any incident that may occur during the entire teaching-learning process.

For this purpose, this educational entity undertakes to take out a liability insurance policy to cover any eventuality that may arise during the stay at the internship center.

This liability policy for interns will have broad coverage and will be taken out prior to the start of the practical training period. That way professionals will not have to worry if they have to deal with an unexpected situation and will be covered until the end of the practical program at the center.



## General Conditions of the Internship Program

The general terms and conditions of the internship agreement for the program are as follows:

**1. TUTORING:** during the Hybrid Professional Master's Degree students will be assigned two tutors who will accompany them throughout the process, resolving any doubts and questions that may arise. On one hand, there will be a professional tutor belonging to the internship center who will have the purpose of guiding and supporting the student at all times. On the other hand, they will also be assigned with an academic tutor, whose mission will be to coordinate and help the students during the whole process, solving doubts and facilitating everything they may need. In this way, the student will be accompanied and will be able to discuss any doubts that may arise, both clinical and academic.

**2. DURATION:** the internship program will have a duration of three continuous weeks of practical training, distributed in 8-hour days and five days a week. The days of attendance and the schedule will be the responsibility of the center and the professional will be informed well in advance so that they can make the appropriate arrangements.

**3. ABSENCE:** in case of no-show on the day of the Hybrid Professional Master's Degree, the student will lose the right to the it without the possibility of reimbursement or change Absence for more than two days from the internship, without justification or a medical reason, will result in the professional's withdrawal from the internship, therefore, automatic termination the internship. Any problems that may arise during the course of the internship must be urgently reported to the academic tutor.

**4. CERTIFICATION:** Students who successfully complete the Hybrid Professional Master's Degree will receive a certificate accrediting the stay at the center in question.

**5. EMPLOYMENT RELATIONSHIP:** The Hybrid Professional Master's Degree does not constitute an employment relationship of any kind.

**6. PREVIOUS STUDIES:** some centers may require a certificate of previous studies for the Hybrid Professional Master's Degree. In these cases, it will be necessary to submit it to the TECH internship department so that the assignment of the chosen center can be confirmed.

**7. NOT INCLUDED:** the Hybrid Professional Master's Degree will not include any element not described in these conditions. Therefore, it does not include accommodation, transportation to the city where the internship takes place, visas or any other items not listed

However, students may consult with their academic tutor for any questions or recommendations in this regard. The academic tutor will provide the student with all the necessary information to facilitate the procedures in any case.

08

# Where Can I Do the Clinical Internship?

TECH has a wide range of clinical, hospital and scientific institutions that students can choose from for their internships. These centers have been carefully selected for their expertise in nutrition and their dedication to preparing nursing professionals. Students will have the opportunity to work with advanced technologies and protocols in a patient care setting, which will provide valuable hands-on experience for their career.





“

*Orient your professional profile towards Genomic Nutrition thanks to these clinical internships that TECH offers you"*



Students can take the practical part of this Hybrid Professional Master's Degree at the following centers:



Nurses

### Hospital HM Regla

Country	City
Spain	León

Address: Calle Cardenal Landázuri, 2, 24003, León

Network of private clinics, hospitals and specialized centers distributed all over the Spanish geography.

**Related internship programs:**

- Update on Psychiatric Treatment in Minor Patients



Nurses

### Hospital HM Nou Delfos

Country	City
Spain	Barcelona

Address: Avinguda de Vallcarca, 151, 08023 Barcelona

Network of private clinics, hospitals and specialized centers distributed all over the Spanish geography.

**Related internship programs:**

- Aesthetic Medicine
- Clinical Nutrition in Medicine



Nurses

### Hospital HM Nuevo Belén

Country	City
Spain	Madrid

Address: Calle José Silva, 7, 28043, Madrid

Network of private clinics, hospitals and specialized centers distributed all over the Spanish geography.

**Related internship programs:**

- General and Digestive System Surgery
- Clinical Nutrition in Medicine



Nurses

### Policlínico HM Distrito Telefónica

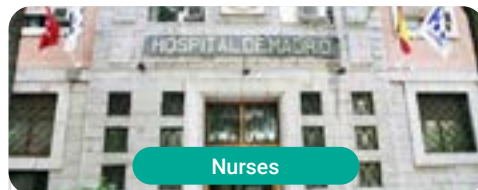
Country	City
Spain	Madrid

Address: Ronda de la Comunicación, 28050, Madrid

Network of private clinics, hospitals and specialized centers distributed all over the Spanish geography.

**Related internship programs:**

- Optical Technologies and Clinical Optometry
- General and Digestive System Surgery



Nurses

### Policlínico HM Gabinete Velázquez

Country	City
Spain	Madrid

Address: C. de Jorge Juan, 19, 1° 28001, 28001, Madrid

Network of private clinics, hospitals and specialized centers distributed all over the Spanish geography.

**Related internship programs:**

- Clinical Nutrition in Medicine
- Aesthetic Plastic Surgery



Nurses

### Policlínico HM Las Tablas

Country	City
Spain	Madrid

Address: C. de la Sierra de Atapuerca, 5, 28050, Madrid

Network of private clinics, hospitals and specialized centers distributed all over the Spanish geography.

**Related internship programs:**

- Nursing in the Traumatology Service
- Diagnosis in Physiotherapy



Nurses

### Policlínico HM Moraleja

Country	City
Spain	Madrid

Address: P.º de Alcobendas, 10, 28109, Alcobendas, Madrid

Network of private clinics, hospitals and specialized centers distributed all over the Spanish geography.

**Related internship programs:**

- Rehabilitation Medicine in Acquired Brain Injury Management



**Nurses**

**Policlínico HM Sanchinarro**

Country	City
Spain	Madrid

Address: Av. de Manoteras, 10,  
28050, Madrid

Network of private clinics, hospitals and specialized centers distributed all over the Spanish geography.

---

**Related internship programs:**

- Gynecological Care for Midwives
- Nursing in the Digestive Tract Department



*Take advantage of this opportunity to surround yourself with expert professionals and learn from their work methodology"*

09

# 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 Nursing School 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. Nurses learn better, faster, and more sustainably over time.

*With TECH, nurses can experience a learning methodology 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, in an attempt to recreate the real conditions in professional nursing 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:

1. Nurses who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their knowledge.
2. The learning process has a clear focus on practical skills that allow the nursing professional to better integrate knowledge acquisition into the hospital setting or primary care.
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 case studies with a 100% online learning system based on repetition combining a minimum of 8 different elements in each lesson, which is a real revolution compared to the simple study and analysis of cases.



*The nurse 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 we have trained more than 175,000 nurses with unprecedented success in all specialities regardless of practical workload. Our pedagogical methodology is developed in a highly competitive environment, with a university student body with a strong socioeconomic profile and an average age of 43.5 years old.

*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 produced by the specialists who teach the course, specifically for the course, so that the teaching content is really 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.



### Nursing Techniques and Procedures on Video

We introduce you to the latest techniques, to the latest educational advances, to the forefront of current medical techniques. 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 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 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.



# 10 Certificate

The Professional Master's Degree in Genomic and Precision Nutrition for Nursing guarantees students, in addition to the most rigorous and up-to-date education, access to a Professional Master's Degree diploma issued by TECH Global University.



“

*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 **Hybrid Professional Master's Degree diploma in Genomic and Precision Nutrition for Nursing** 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: **Hybrid Professional Master's Degree in Genomic and Precision Nutrition for Nursing**

Course Modality: **Hybrid (Online + Clinical Internship)**

Duration: **12 months**

Certificate: **TECH Global University**

Recognition: **60 + 5 ECTS Credits**



\*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  
development languages  
virtual classroom



## Hybrid Professional Master's Degree

Genomic and Precision Nutrition for Nursing

Modality: Hybrid (Online + Clinical Internship)

Duration: 12 months

Certificate: TECH Global University

60 + 5 ECTS Credits

# Hybrid Professional Master's Degree

Genomic and Precision Nutrition  
for Nursing