Postgraduate Diploma
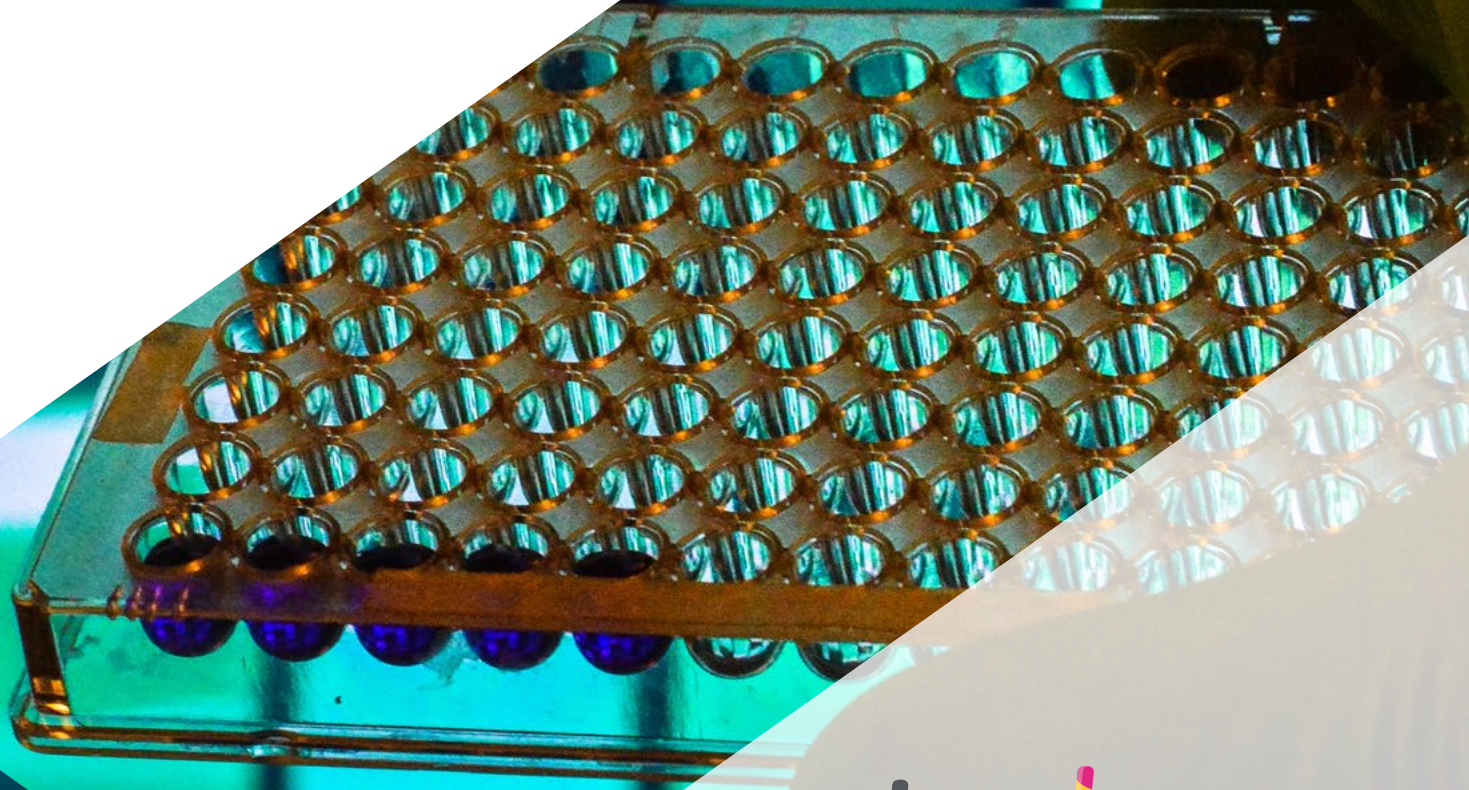
Nutritional Genomics and Precision Nutrition. Laboratory, Biostatistics and Current Market

tech technological university

Postgraduate Diploma
Nutritional Genomics and Precision Nutrition. Laboratory, Biostatistics and Current Market

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

Website: **www.techtitute.com/pk/medicine/postgraduate-diploma/postgraduate-diploma-nutritional-genomics-precision-nutrition-laboratory-biostatistics-current-market**

Index

01
Introduction

In recent years, given the benefits found in the relationship between genetics and nutrition, the development of studies focused on Genomic and Precision Nutrition research has become popular. To optimize the results obtained, these require medical professionals with a high mastery of the most efficient laboratory techniques or Biostatistics. This program has been created in order to broaden the physician's competence in the mechanisms of DNA extraction or in the management of statistical biases in order to meet the demands of a growing field. In addition, the program is 100% online, without leaving home.

Master, with this program, the most efficient mechanisms to manage statistical biases in Genomic and Precision Nutrition studies without compromising the results obtained"

Genomic and Precision Nutrition is a discipline that is in a continuous boom because the excellent advantages it brings to the area of Medicine have been detected, making possible the adoption of dietary plans oriented to the genetic particularities of each patient to combat diseases. These benefits have been found through numerous investigations, whose elaboration is essential to optimize the subsequent work of professionals in the more strictly practical health field. However, in order to carry out these studies properly, it is necessary to have the most up-to-date laboratory and biostatistical techniques available, in order to extract maximum performance and high efficiency in the research work.

For this reason, TECH has opted to design this program, through which the doctor will master the intricacies of this field related to Genomic and Precision Nutrition to perform their research tasks with a high level of solvency. Throughout this educational pathway, you will delve into the use of the most cutting-edge programs and tools for bioinformatics analysis or handle statistical errors in an appropriate way so as not to compromise the final result of the study. Likewise, you will master the use of the most common statistical software in this discipline.

Since this program has a 100% online modality, students will be able to achieve an effective learning process by managing their own time as they wish. In addition, you will have access to excellent teaching materials available in such innovative formats as explanatory video or interactive summary, which will allow you to enjoy an agreeable learning experience completely adapted to your educational requirements.

This **Postgraduate Diploma in Nutritional Genomics and Precision Nutrition. Laboratory, Biostatistics and Current Market** 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 practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice

- Practical exercises where the self-assessment process can be carried out to improve learning

- Its special emphasis on innovative methodologies

- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection work

- Content that is accessible from any fixed or portable device with an Internet connection

This Postgraduate Diploma will enable you to use the most advanced and up-to-date programs and tools for bioinformatics analysis"

Acquire innovative competences for the design of clinical studies in humans by means of this Postgraduate Diploma"

Perfect your research work in the field of Genomic and Precision Nutrition through the knowledge you will acquire in this program.

Compatibilize your excellent learning with your personal and work obligations thanks to all the teaching facilities provided by this TECH program.

The program's teaching staff includes professionals in the sector who contribute their work experience to this training program, as well as renowned specialists from leading 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 immersive education 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 during the academic year For this purpose, the students will be assisted by an innovative interactive video system created by renowned and experienced experts.

02
Objectives

This Postgraduate Diploma has been designed with the idea in mind to provide the medical professional with an excellent knowledge in the area of Genomic and Precision Nutrition, with the aim of perfecting their professional practice, focusing especially on the laboratory field. During your experience, you will identify the most commonly used techniques in the performance of studies related to this field or master the different technical and legal aspects of this discipline. All this, by following these general and specific objectives outlined by TECH.

Get a qualification from one of the most prestigious academic institutions and high-level competencies to support your professional growth in the field of Genomic and Precision Nutrition"

General Objectives

- Acquire theoretical knowledge of human population genetics
- Acquire knowledge of Nutritional Genomics 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
- Understand how nutrition influences gene expression in humans.
- Learn about new concepts and future trends in the field of Nutritional Genomics 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 Nutritional Genomics and Precision Nutrition in order to know how to apply it in their professional activity
- Put all the updated knowledge in 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

Module 1. Introduction to Nutritional Genomics and Precision Nutrition

- Present definitions necessary to follow the thread of the following modules
- Explain relevant points of human DNA, nutritional Epidemiology, scientific method
- Analyze key studies in Genomic Nutrition

Module 2. Laboratory Techniques for Nutritional Genomics

- Understand the techniques Employees in Nutritional Genomics Studies
- Master state-of-the-art DNA extraction techniques
- Acquire the latest advances in omics and bioinformatics techniques
- Use the most up-to-date bioinformatics programs and tools

Module 3. Biostatistics for Genomic Nutrition

- Acquire the necessary knowledge to correctly design experimental studies in the fields of nutrigenomics and nutrigenetics
- Delve into statistical models for clinical studies in humans
- Deal adequately with possible errors or statistical biases
- Master the use of the main statistical software programs

Module 4. Current Market State

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

03

Course Management

With TECH's goal to offer the highest academic level qualifications, this program is directed and taught by excellent specialists in the area of Genomic and Precision Nutrition who have worked in prestigious laboratories and research centers related to this field. These professionals are responsible for making all the didactic resources available throughout this Postgraduate Diploma. Therefore, all the contents provided to the student will be completely applicable in their professional experiences.

This Postgraduate Diploma is taught by active experts in the area of Genomic and Precision Nutrition, who will provide you with the most updated didactic contents in this field"

Management

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 the American Society of Nutrition

Professors

Dr. García Santamarina, Sarela

- Group Leader at the Institute of Chemical and Biological Technology of the New University of Lisbon, Lisbon
- Postdoctoral Researcher EIPOD Marie Curie for: Effects of Drugs on Intestinal Flora, at the European Molecular Biology Laboratory (EMBL) in Heidelberg, Germany
- Postdoctoral Research Fellow: Mechanisms of copper homeostasis in the interaction between the pathogenic fungus Cryptococcus neoformans and the host, Duke University, USA
- PhD in Biomedical Research, Pompeu Fabra University of Barcelona
- Degree in Chemical Major in Organic Chemistry, University of Santiago de Compostela
- Master's Degree in Molecular Biology of Infectious Diseases, London School of Hygiene & Tropical Medicine in London
- Master's Degree in Biochemistry and Molecular Biology, Autonomous University of Barcelona

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

04
Structure and Content

The syllabus of this degree is made up of 4 modules with which students will significantly expand their knowledge in the area of Genomic and Precision Nutrition, especially oriented to laboratory tasks. All the didactic materials to which you will have access throughout this educational period are available in convenient and varied formats such as complementary readings, explanatory video or interactive summary. This, in addition to its 100% online methodology, will favor a learning process adapted to the needs and particularities of study of each student.
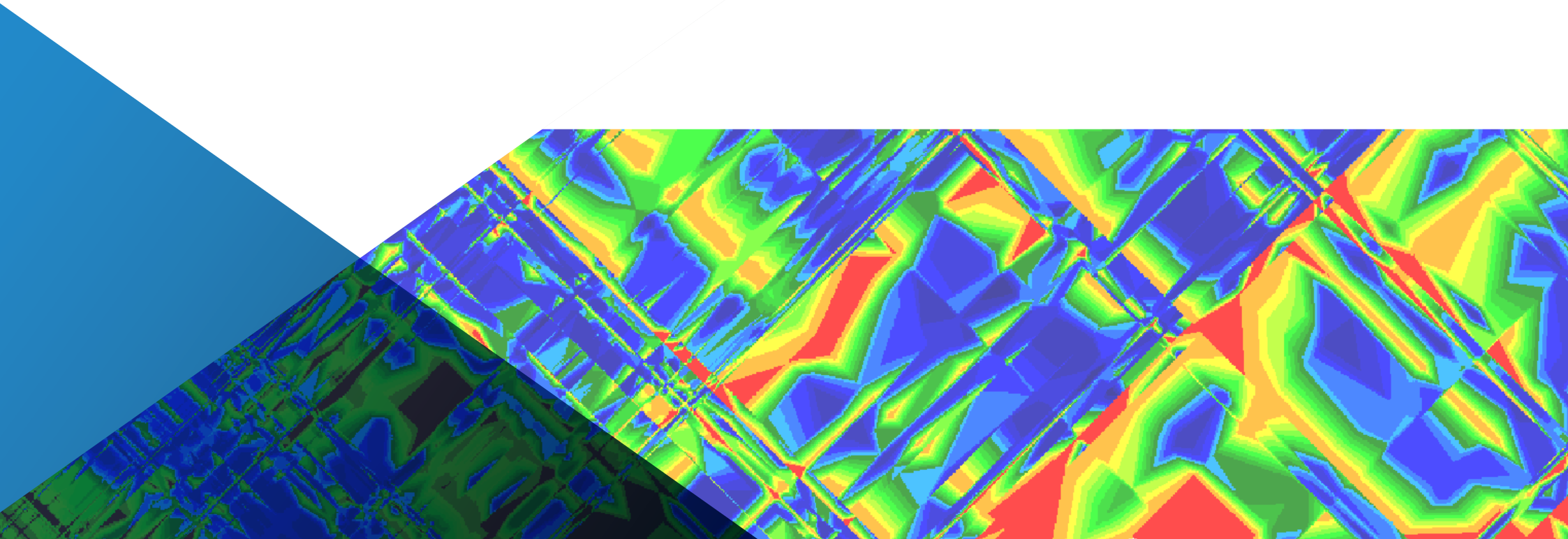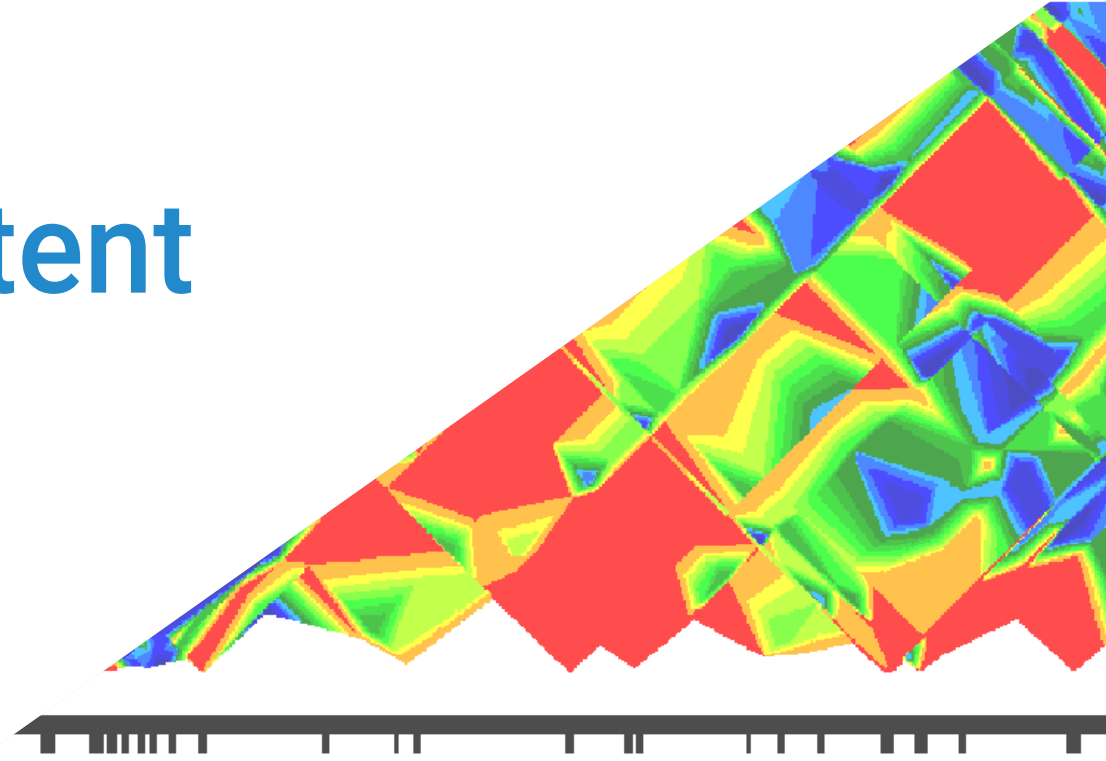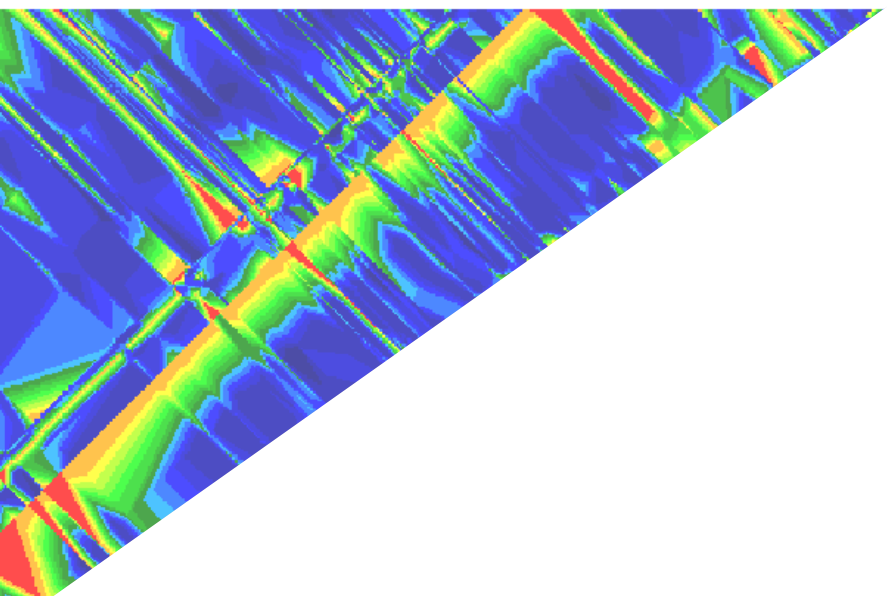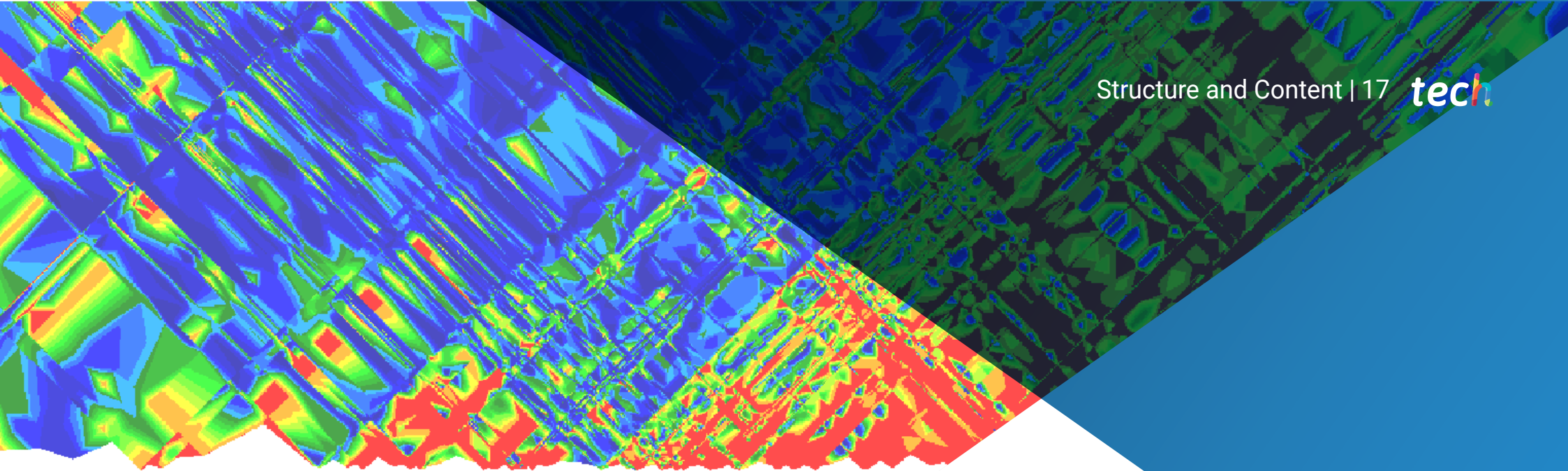
Enjoy this syllabus, designed by the best professionals in Genomic and Precision Nutrition to guarantee the work applicability of everything you learn"

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 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 in 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. Omic 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
- 3.3.3. 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. Control Group
- 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 Covariate
- 3.9.1. ANCOVA
- 3.9.2. Logistic Regression for Binary and Count Variables
- 3.9.3. Multivariate Analysis

3.10. Statistical Programs
- 3.10.1. The R
- 3.10.2. SPSS

Module 4. Current Market State

4.1. Legal Aspects

4.2. DTC (Direct-to-Consumer) Tests
- 4.2.1. Pros and Cons
- 4.2.2. Myths of Early DTCs

4.3. Quality Criteria for a Nutrigenetic Test
- 4.3.1. SNP Selection
- 4.3.2. Interpretation of Results
- 4.3.3. Laboratory Accreditations

4.4. Health Professionals
- 4.4.1. Training Needs
- 4.4.2. Criteria of Professionals Applying Genomic Nutrition

4.5. Nutrigenomics in the Media

4.6. Integration of Evidence for Personalized Nutritional Counseling

4.7. Critical Analysis of the Current Situation

4.8. Discussion Work

4.9. Conclusions, use of Nutritional Genomics and Precision Nutrition as Prevention

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 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 you will 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 in the physician's professional 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. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that evaluate real situations and the application of 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 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.

Professionals will learn through real cases and by resolving complex situations in simulated learning environments. These simulations are developed using state-of-the-art software to facilitate immersive learning.

01 learning from evidence

02 relearning from evidence

03 testing

04 learning from an expert

05 neurocognitive context dependent learning

06 Von-Restorff effect

07 case based learning through storytelling

08 competencies testing (retesting)

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 250,000 physicians have been trained with unprecedented success in all clinical specialties regardless of surgical load. 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 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.

Surgical Techniques and Procedures on Video

TECH introduces students to the latest techniques, the latest educational advances and 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 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.

20%

15%

15%

3%

20%

17%

7%

3%

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 on the usefulness of learning by observing experts. The system known as 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.

06

Certificate

This Postgraduate Diploma in Nutritional Genomics and Precision Nutrition. Laboratory, Biostatistics and Current Market guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma issued by TECH Technological University.

Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork"

This **Postgraduate Diploma in Nutritional Genomics and Precision Nutrition. Laboratory, Biostatistics and Current Market** 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 Nutritional Genomics and Precision Nutrition. Laboratory, Biostatistics and Current Market**

Official Nº of Hours: **600 h.**

---

tech technological university

Awards the following

CERTIFICATE
to

Mr./Ms. _____, with identification number _____ .
For having passed and accredited the following program

POSTGRADUATE DIPLOMA
in

Nutritional Genomics and Precision Nutrition.
Laboratory, Biostatistics and Current Market

This is a qualification awarded by this University, equivalent to 600 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy .

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018 .

June 17, 2020

Tere Guevara Navarro
Dean

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country.   Unique TECH Code: AFWORD23S   techtitute.com/certificates

---

*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.

tech technological university

Postgraduate Diploma
Nutritional Genomics and
Precision Nutrition.
Laboratory, Biostatistics
and Current Market

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

Postgraduate Diploma
Nutritional Genomics and
Precision Nutrition. Laboratory,
Biostatistics and Current Market

tech technological university