Postgraduate Certificate

Genetics, Pathologies and Biobanks Network

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Postgraduate Certificate

Genetics, Pathologies and Biobanks Network

Course Modality: **Online**

Duration: **6 weeks**

Certificate: **TECH Technological University**

Teaching Hours: **150 hours.**

Website: www.techtitute.com/us/medicine/postgraduate-certificate/genetics-pathologies-biobanks-network

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01

Introduction

Genetic medicine has developed exponentially in recent times, supported in a fundamental way by the essential work in the clinical analysis laboratory. This permanent and rapid evolution requires the professional to keep up to date in order to develop their skills in new scenarios.

In this complete Postgraduate Certificate, we offer you the possibility to increase your competitiveness in a simple and very efficient way.

Through the most developed teaching techniques, you will learn the theory and practice of all the advances needed to work in a clinical analysis laboratory at a high level. With a structure and plan that is totally compatible with your personal and professional life.

The latest techniques and work systems in Genetics, Pathologies and Biobanks Network in the clinical analysis laboratory, with the most efficient teaching system on the market"

The research and techniques developed in genetics are very useful for the study of the cause, transmission and pathogenesis of numerous diseases. The objective of genetic medicine is to understand the different types of genetic alterations that give rise to diseases, analyze their transmission, identify carriers, and develop methods of prevention and treatment. In the laboratory, this study takes place in a practical way in the most important and specific developments in this area of work.

This module provides an in-depth analysis of the bases and mechanisms of the transmission of genetic material, with special attention to the particularities and characteristics of human genetics: the different genetic alterations that can give rise to diseases, the techniques and methods for diagnosing them, as well as the latest advances and research carried out in this field. All of this in the field of clinical analysis laboratories.

A compendium and deepening of knowledge that will lead you to excellence in your profession.

With this Postgraduate Certificate, you will be able to combine a high intensity specialization with your professional and personal life, achieving your goals in a simple and real way"

This **Postgraduate Certificate in Genetics, Pathologies and Biobanks Network** offers you the characteristics of a high-level scientific, teaching and technological course. These are some of its most notable features:

- The latest technology in online teaching software
- A highly visual teaching system, supported by graphic and schematic contents that are easy to assimilate and understand
- Practical cases presented by practising experts
- State-of-the-art interactive video systems.
- Teaching supported by telepractice
- Continuous updating and recycling systems
- Autonomous learning: full compatibility with other occupations
- Practical exercises for self-evaluation and learning verification
- Support groups and educational synergies: questions to the expert, debate and knowledge forums.
- Communication with the teacher and individual reflection work
- Content that is accessible from any fixed or portable device with an Internet connection
- Supplementary documentation databases are permanently available, even after the course

A highly skilled Postgraduate Certificate which will allow you to become one of the best trained professionals in Genetics in a clinical analysis laboratory"

The teachers of this Postgraduate Certificate are professionals currently working in a modern and accredited Clinical Laboratory, with a very solid training base and up to date knowledge in both scientific and purely technical disciplines.

In this way, we ensure that we provide you with the training update we are aiming for. A multidisciplinary team of professionals trained and experienced in different environments, who will cover the theoretical knowledge in an efficient way, but, above all, will put the practical knowledge derived from their own experience at the service of the course: one of the differential qualities of this course.

This mastery of the subject is complemented by the effectiveness of the methodological design of this Postgraduate Certificate in Genetics, Pathologies and Biobanks Network. Developed by a multidisciplinary team of experts who integrate the latest advances in educational technology. In this way, you will be able to study with a range of easy-to-use and versatile multimedia tools that will give you the necessary skills you need for your specialization.

The design of this program is underpinned by Problem-Based Learning: an approach that views learning as a highly practical process. To achieve this remotely, we will use telepractice: with the help of an innovative interactive video system, and Learning from an Expert you will be able to acquire the knowledge as if you were facing the scenario you are learning at that moment. A concept that will allow you to integrate and fix learning in a more realistic and permanent way.

A program created and directed by active professionals in this field of work, which makes this Postgraduate Certificate a unique opportunity for professional growth.

The learning of this Postgraduate Certificate is developed through the most advanced didactic means in online teaching to guarantee that your effort will have the best possible results.

02

Objectives

The objective of this training is to offer professionals who work in clinical analysis laboratories, the necessary knowledge and skills to perform their duties using the most advanced protocols and techniques of the moment. Through a study plan totally adapted to the student, this Postgraduate Certificate will progressively allow you to acquire the skills that will push you towards a much higher professional level.

Learn from the best and study the techniques and work procedures of Clinical Analysis to be able to work in the best laboratories in the field.

General Objectives

- Determine the nature of hereditary material and establish the mechanisms of transmission of traits.
- Identify different genetic alterations and analyze the causes and possible consequences.
- Establish and define the different types of genetically based diseases and substantiate the causes of these diseases.
- Compile different molecular biology techniques currently used for diagnosis and genetic analysis. Interpret the results obtained from them.
- Present the latest advances in the field of genetic medicine, genomics and personalized medicine.

A boost to your CV that will give you the competitiveness of the best prepared professionals in the labor market"

Specific Objectives

- Construct detailed family trees and perform segregation analysis.
- Examine karyotypes and identify chromosomal abnormalities.
- Analyze the probability of transmission of genetically based diseases and identify potential carriers.
- Study the fundamentals of the application of different molecular biology techniques for the diagnosis and investigation of genetic diseases: PCR, hybridization techniques, restriction and sequencing assays, among others.
- Interpret the results obtained from analysis techniques used in the characterization of genetic alterations or molecular markers.
- Identify different genetically based diseases in detail, establish their causes and diagnostic methods.
- Establish the legal and ethical aspects related to medical genetics and the new technologies developed in the field of genetics.
- Present the new genomic and bio-informatics tools, their benefits and scope of application. Perform searches in genomic databases.

03

Course Management

For our course to be of the highest quality, we are proud to work with a teaching staff of the highest level, chosen for their proven track record. Professionals from different areas and fields of expertise that make up a complete, multidisciplinary team. A unique opportunity to learn from the best.

An impressive teaching staff, made up of professionals from different areas of expertise, will be your teachers during your training: a unique opportunity not to be missed"

International Guest Director

Jeffrey Jhang, M.D. is a dedicated expert in Clinical Pathology and Laboratory Medicine. He has won several awards in these areas, including the Dr. Joseph G. Fink Award from the Columbia University College of Medicine and Surgery, among other recognitions from the College of American Pathologists.

His scientific leadership has been latent thanks to his exhaustive work as Medical Director of the Clinical Laboratory Center, attached to the Icahn School of Medicine at Mount Sinai. At the same institution, he coordinates the Department of Transfusion Medicine and Cell Therapy. In addition, Dr. Jhang has held management positions in the Clinical Laboratory at the Langone Health Center of New York University and as Chief of the Laboratory Service at Tisch Hospital.

Through these experiences, the expert has mastered different functions such as the supervision and management of laboratory operations, complying with the main regulatory standards and protocols. In turn, he has collaborated with interdisciplinary teams to contribute to the accurate diagnosis and care of different patients. On the other hand, he has spearheaded initiatives to improve the quality, performance and efficiency of analytical technical facilities.

Dr. Jhang, Jeffrey

- Director of Clinical Laboratories at NYU Langone Health, New York, United States
- Director of Clinical Laboratories at NYU Tisch Hospital, New York
- Professor of Pathology at the NYU Grossman School of Medicine
- Medical Director of the Clinical Laboratory Center at Mount Sinai Health System
- Director of the Blood Bank and Transfusion Service at Mount Sinai Hospital
- Director of Hematology and Coagulation Specialty Laboratory at Columbia University Irving Medical Center
- Director of the Parathyroid Tissue Collection and Processing Center at Columbia
- University Irving Medical Center
- Assistant Director of Transfusion Medicine at Columbia University Irving Medical Center
- Transfusion Medicine Specialist at the New York Blood Bank
- M.D. from the Icahn School of Medicine at Mount Sinai
- Anatomic and Clinical Pathology Residency at NewYork-Presbyterian Hospital
- Member of:

Thanks to TECH, you will be able to learn with the best professionals in the world"

Management

Ms. Cano Armenteros, Montserrat

- Bachelor's Degree in Biology. University of Alicante
- Master's Degree in Clinical Trials University of Seville
- Official Master's Degree in Primary Care Research by the Miguel Hernández University of Alicante for the Doctorate
- Recognition from the University of Chicago, USA Outstanding
- Certificate of Pedagogical Aptitude (CAP) University of Alicante

Professors

Dr. Corbacho Sánchez, Jorge

- Degree and International PhD in Biology from the University of Extremadura.
- Degree in Biology from the University of Extremadura, 2012.
- Master's Degree in Quality and Traceability of Plant-based Food from the Univeristy of Extremadura, 2013.
- PhD in Plant Biology, Ecology and Earth Sciences from the University of Extremadura in 2015.
- Master's Degree in Advanced Bioinformatics Analysis by the Pablo de Olavide University in 2018.

04

Structure and Content

The contents of this Postgraduate Certificate have been developed by the different teachers of this course, with a clear purpose: to ensure that our students acquire each and every one of the skills necessary to become true experts in this field.

A complete and well-structured program that will take you to the highest standards of quality and success.

A comprehensive and specific Postgraduate Certificate that will boost your professional development with the assurance of the best training and the highest skill level"

Module 1 Genetics

1.1. Introduction to Genetic Medicine Genealogies and Inheritance Patterns
- 1.1.1. Historical Development of Genetics Key Concepts
- 1.1.2. Structure of Genes and Regulation of Genetic Expression Epigenetics
- 1.1.3. Genetic Variability Mutation and Reparation of DNA
- 1.1.4. Human Genetics Organization of the Human Genome
- 1.1.5. Genetic Diseases Morbidity and Mortality
- 1.1.6. Human Inheritance Concept of Genotype and Phenotype
  - 1.1.6.1. Mendelian Inheritance Patterns
  - 1.1.6.2. Multigene and Mitochondrial Inheritance
- 1.1.7. Construction of Genealogies
  - 1.1.7.1. Allele, Genotypic and Phenotypic Frequency Estimation
  - 1.1.7.2. Segregation Analysis
- 1.1.8. Other Factors which Affect the Phenotype

1.2. Molecular Biology Techniques Used in Genetics
- 1.2.1. Genetics and Molecular Diagnostics
- 1.2.2. Polymerase Chain Reaction (PCR) Applied to Diagnosis and Research in Genetics
  - 1.2.2.1. Detection and Amplification of Specific Sequences
  - 1.2.2.2. Quantification of Nucleic Acids (RT-PCR)
- 1.2.3. Cloning Techniques: Isolation, Restriction and Ligation of DNA Fragments
- 1.2.4. Detection of Mutations and Measurement of Genetic Variability: RFLP, VNTR, SNPs
- 1.2.5. Mass Sequencing Techniques. NGS
- 1.2.6. Transgenesis Genetic Therapy
- 1.2.7. Cytogenetic Techniques
  - 1.2.7.1. Chromosome Banding
  - 1.2.7.2. FISH, CGH

1.3. Human Cytogenetics Numerical and Structural Chromosomal Abnormalities
- 1.3.1. Study of Human Cytogenetics Features
- 1.3.2. Chromosome Characterization and Cytogenetic Nomenclature
  - 1.3.2.1. Chromosomal Analysis: Karyotype

1.3.3. Anamolies in the Number of Chromosones
1.3.3.1. Polyploidies
1.3.3.2. Aneuploidies
1.3.4. Structural Chromosomal Alterations Genetic Dose
1.3.4.1. Deletions
1.3.4.2. Duplications
1.3.4.3. Inversions
1.3.4.4. Translocations
1.3.5. Chromosomal Polymorphisms
1.3.6. Genetic Imprinting
1.4. Prenatal Diagnosis of Genetic Alterations and Congenital Defects Preimplantational Genetic Diagnosis
1.4.1. Prenatal Diagnosis. What does it entail?
1.4.2. Incidence of Congenital Defects
1.4.3. Indications for Performing Prenatal Diagnosis
1.4.4. Prenatal Diagnostic Methods
1.4.4.1. Non-Invasive Procedures: First and Second Trimester Screening TPNI
1.4.4.2. Invasive Procedures: Amniocentesis, Cordocentesis and Chorionic Biopsy
1.4.5. Preimplantational Genetic Diagnosis Indications.
1.4.6. Embryo Biopsy and Genetic Analysis
1.5. Genetic Diseases I
1.5.1. Diseases with Autosomal Dominant Inheritance
1.5.1.1. Achondroplasia
1.5.1.2. Huntington's Disease
1.5.1.3. Retinoblastoma
1.5.1.4. Charcot-Marie-Tooth Disease
1.5.2. Diseases with Autosomal Recessive Inheritance
1.5.2.1. Phenylketonuria.
1.5.2.2. Sickle Cell Anemia
1.5.2.3. Cystic Fibrosis
1.5.2.4. Laron Syndrome
1.5.3. Diseases with Sex-Linked Inheritance

1.5.3.1. Rett Syndrome
1.5.3.2. Haemophilia
1.5.3.3. Duchenne Muscular Dystrophy

1.6. Genetic Diseases II
1.6.1. Mitochondrial Inheritance Diseases
1.6.1.1. Mitochondrial Encephalomyopathies
1.6.1.2. Leber Hereditary Optic Neuropathy (NOHL)
1.6.2. Genetic Anticipation Phenomena
1.6.2.1. Huntington's Disease
1.6.2.2. Fragile X Syndrome
1.6.2.3. Spinocerebellar Ataxias
1.6.3. Allelic Heterogeneity
1.6.3.1. Usher Syndrome

1.7. Complex Diseases Genetics Molecular Basis of Family and Sporadic Cancer
1.7.1. Multifactorial Inheritance
1.7.1.1. Polygenes
1.7.2. Contribution of Environmental Factors on Complex Diseases
1.7.3. Quantative Genetics
1.7.3.1. Heritability
1.7.4. Common Complex Diseases
1.7.4.1. Diabetes Mellitus
1.7.4.2. Alzheimer's Disease
1.7.5. Behavioral Diseases and Personality Disorders: Alcoholism, Autism and Schizophrenia
1.7.6. Cancer: Molecular Base and Environmental Factors
1.7.6.1. Genetics of Cell Proliferation and Differentiation Processes Cellular Cycle
1.7.6.2. DNA Reparation Genes, Oncogenes and Tumor Suppresor Genes
1.7.6.3. Environmental Influence of the Occurence of Cancer
1.7.7. Familial Cancer

1.8. Genomics and Proteomics
1.8.1. Omic Sciences and their Usefulness in Medicine
1.8.2. Genome Sequencing and Analysis
1.8.2.1. DNA Libraries
1.8.3. Comparative Genomics
1.8.3.1. Organisms Model
1.8.3.2. Sequencing Comparison
1.8.3.3. Human Genome Project
1.8.4. Functional Genomics
1.8.4.1. Transcriptomics
1.8.4.2. Structural and Functional Organization of the Genome
1.8.4.3. Functional Genomic Elements
1.8.5. From the Genome to the Proteome
1.8.5.1. Post-Translational Modifications
1.8.6. Strategies for the Separation and Purification of Proteins
1.8.7. Identification of Proteins
1.8.8. Interactom

1.9. Genetic Assessment Ethical and Legal Aspects of Diagnosis and Research in Genetics
1.9.1. Genetic Assessment Concepts and Base Techniques
1.9.1.1. Risk of Recurrence of Genetically-Based Diseases
1.9.1.2. Genetic Assessment in Prenatal Diagnosis
1.9.1.3. Ethical Principles in Genetic Assessment
1.9.2. Legislation of New Genetic Technology
1.9.2.1. Genetic Engineering
1.9.2.2. Human Cloning
1.9.2.3. Genetic Therapy
1.9.3. Bioethics and Genetics

1.10. Biobanks and Bioinformatics Tools
1.10.1. Biobanks Concept and Functions
1.10.2. Organization, Management and Quality of Biobanks
1.10.3. Spanish Network of Biobanks

1.10.4. Computational Biology
1.10.5. Big Data and Machine Learning
1.10.6. Bioinformatics Applications in Biomedicine
    1.10.6.1. Sequences Analysis
    1.10.6.2. Image Analysis
    1.10.6.2. Personalized and Precision Medicine

A comprehensive teaching program, structured in well-developed teaching units, oriented towards learning that is compatible with your personal and professional life"

05

Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: ***Relearning***.

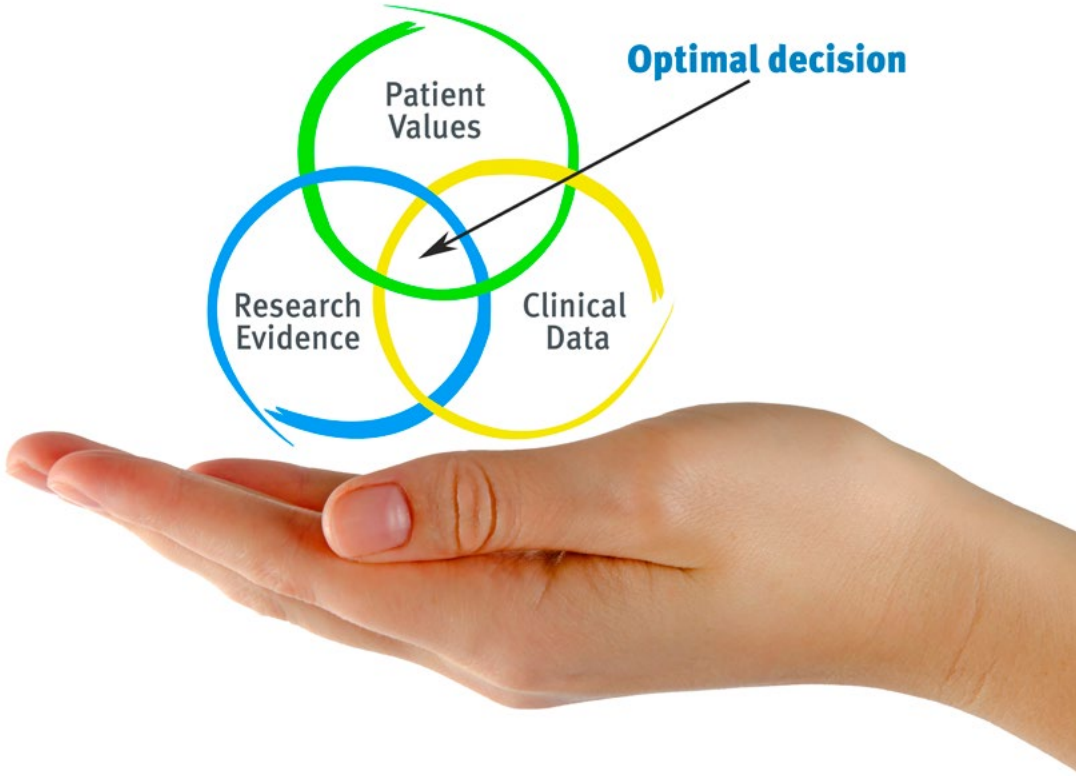
This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the ***New England Journal of Medicine*** have considered it to be one of the most effective.

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

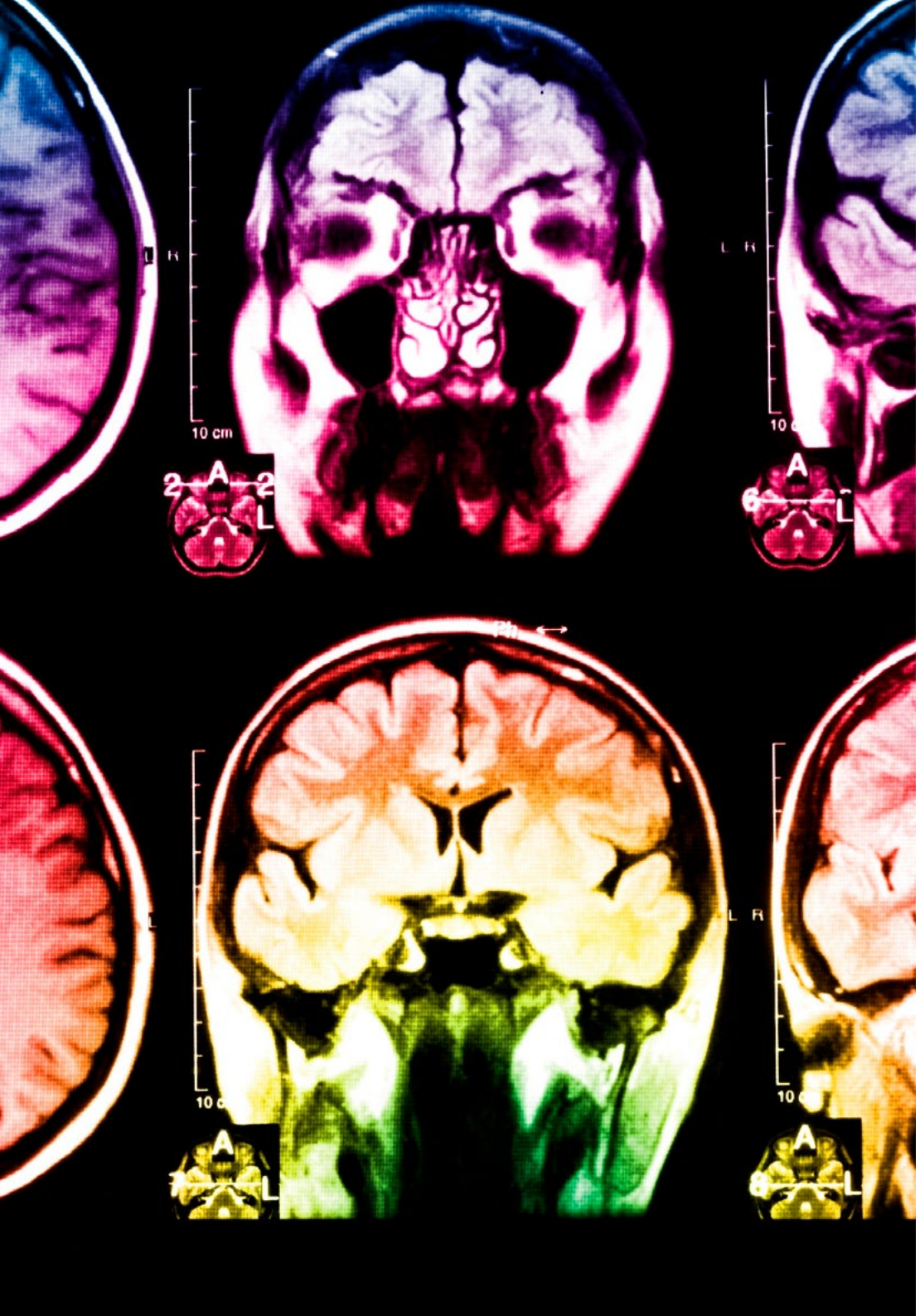
1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that evaluate real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better 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 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.

The physician 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 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.

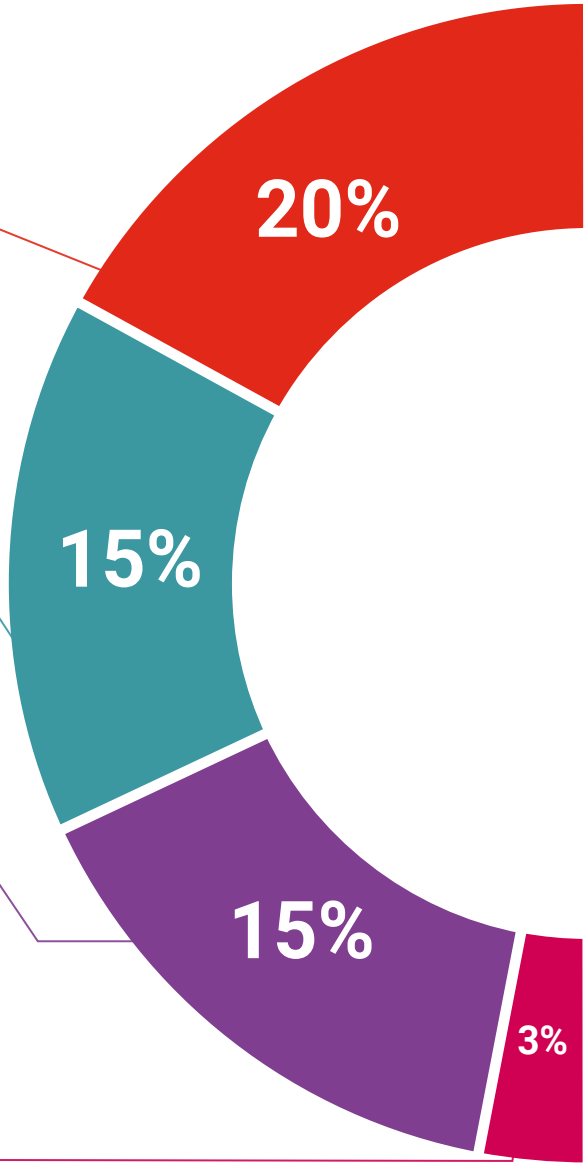
Interactive Summaries

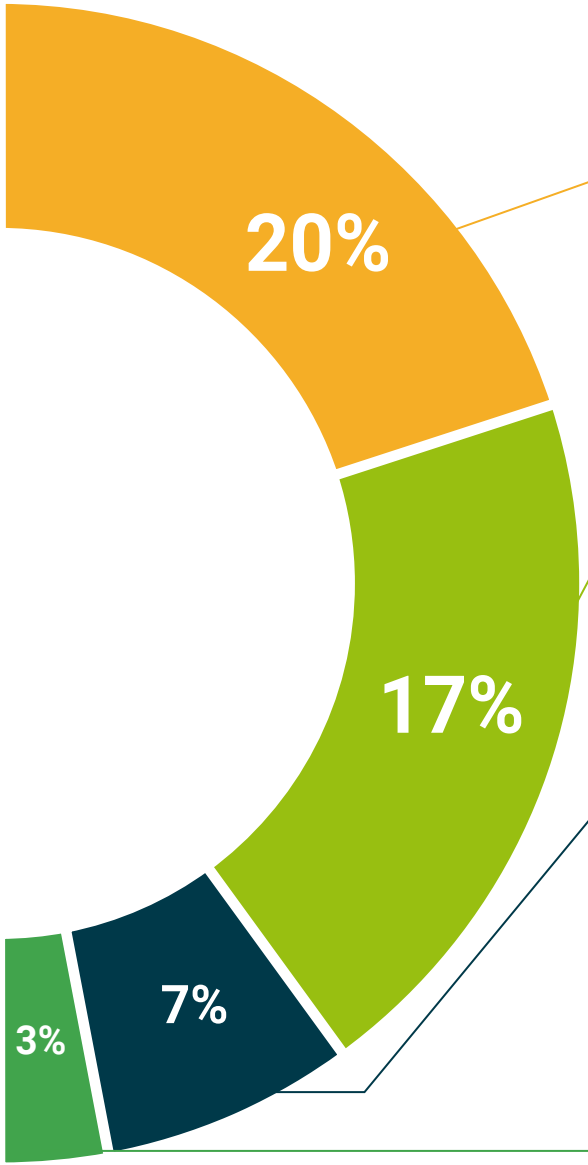
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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.





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

Through a different and stimulating learning experience, you will be able to acquire the necessary skills to take a big step in your training. An opportunity to progress, with the support and monitoring of a modern and specialized university, which will propel you to another professional level.

Include in your training a Postgraduate Certificate in Genetics, Pathologies and Biobanks Network: a highly qualified added value for any professional in this area"

This **Postgraduate Certificate in Genetics, Pathologies and Biobanks Network** contains the most complete and up-to-date scientific program on the market.

After the students have passed the assessments, they will receive their corresponding **Postgraduate Certificate** issued by **TECH Technological University via tracked delivery**.

The diploma issued by **TECH Technological University** will reflect the qualification obtained in the Postgraduate Certificate, and meets the requirements commonly demanded by labor exchanges, competitive examinations and professional career evaluation committees.

Title: **Postgraduate Certificate in Genetics, Pathologies and Biobanks Network**
Official Nº of Hours: **150 hours.**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Awards the followi ng

DIPLOMA

to

Mr./Ms. _____, with identification number _____ .

For having passed and accredited the following progra m

POSTGRADUATE CERTIFICATE

in

Genetics, Pathologies and Biobanks Network

This is a qualification awarded by this University, equivalent to 150 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 Navar ro
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 diploma issued with an apostille, TECH EDUCATION will make the necessary arrangements to obtain it, at an additional cost.


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