

Postgraduate Diploma Biotechnology in the Field of Clinical Analysis



Postgraduate Diploma Biotechnology in the Field of Clinical Analysis

Course Modality: **Online**

Duration: **6 months.**

Certificate: **TECH Technological University**

18 ECTS Credits

Teaching Hours: **450 hours.**

Website: www.techtitute.com/medicine/postgraduate-diploma/postgraduate-diploma-biotechnology-field-clinical-analysis

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01

Introduction

The numerous advances and developments in the field of biotechnology have led to an evolution in laboratory work, with the introduction of new techniques and ways of working. This requires the professional to keep up to date in order to develop their skills in new workplace scenarios.

In this complete course we offer you the possibility to achieve your qualification 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.



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*Update your knowledge in all the advances in
Biotechnology in the Field of Clinical Analysis with
the most efficient teaching system on the market”*

The specialty of Clinical Analysis has an eminently multidisciplinary character, and it is the students themselves who must focus on those aspects in which they are lacking training, depending on their educational background.

Through this Postgraduate Diploma the clinical professional will achieve excellence in the knowledge of instrumental techniques and sample collection techniques, as the basis of analytical methodology. This is one of the fundamental points of their expertise as specialists in the area. Upon completing this course, the professional will have gained an understanding of instrumental techniques and their management, being equipped with specialized skills in order to perform these tasks in the laboratory.

However, in recent decades, Biochemistry has experienced a great boost due to the advancement of research techniques, thus allowing for the possibility of a more molecular and scientific development of Medicine.

The most clinical part of this modality is oriented to analysis in hospital laboratories that allows patient care as clinical support for physicians. Therefore, research in clinical biochemistry or biomedicine is an essential science nowadays as it serves to study the molecular mechanisms of the physiological processes that occur in our organism and at the same time, it allows us to investigate the failure of these physiological processes and their consequences for health.

In an application closer to medicine, the research and techniques developed in genetics are of great use 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.

This **Postgraduate Diploma in Biotechnology in the Field of Clinical Analysis** offers you the advantages of a high-level scientific, teaching, and technological course. These are some of its most notable features:

- ♦ Latest technology in online teaching software.
- ♦ 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.
- ♦ Self-regulating 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 compendium and deepening of knowledge that will lead you to excellence in your profession"

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A highly skilled course which will allow you to become a highly competent professional in Biotechnology in Clinical Analysis in a clinical analysis laboratory”

Our innovative telepractice concept will give you the opportunity to learn through an immersive experience, which will provide you with a faster integration and a much more realistic view of the contents: “learning from an expert”.

The teachers of this course 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 Diploma in Biotechnology in the Field of Clinical Analysis. Developed by a multidisciplinary team of experts, it integrates 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.



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.





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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

- Facilitate the work of the physician in Clinical Analysis.
- Update knowledge within this discipline.
- Learn new tools used in clinical practice.
- Gain deeper understanding of the scientific and methodological aspects of the specialty.
- Address some management and team work topics.
- Address issues related to quality, which have become essential in the current clinical laboratory model.



Specific Objectives

- Acquire the knowledge to organize a laboratory with acceptable levels of safety in the management of samples.
- Learn how to manage the waste from the analytical process.
- Know the intra- and inter-laboratory quality control systems.
- Know the process for certifying and/or accrediting a clinical laboratory and the advantages it entails.



- ♦ Acquire knowledge of the different analytical techniques used in the Clinical Laboratory.
- ♦ Know its methodological foundations and its practical usefulness.
- ♦ Assess their precision and accuracy characteristics, ease of automation, ease of use, indications and possible uses.
- ♦ Learn how to choose the best analytical technique according to the parameter to be measured, the required sensitivity, the characteristics of the space and the automation possibilities of each laboratory.
- ♦ Assess the ease of use and costs, so that each of them can be adapted to the different types and concepts of laboratories.
- ♦ Detect analytical interferences, depending on the parameter to be measured and the method used.
- ♦ Understand the immune system, its components, tissues, cells, immunoglobulins and complement system as well as the main functions of each one of them.
- ♦ Know the major histocompatibility complex, its diseases and its implication in organ transplantation.
- ♦ Understand the mechanisms of the immune response as well as the concepts of alloreactivity and tolerance.
- ♦ Know the diverse pathologies of the immune system.
- ♦ Acquire general knowledge of genetics and the texts to carry out for its diagnosis.
- ♦ Know the inheritance patterns, learning how to perform genetic counseling taking into account ethical, psychological and legal aspects.
- ♦ Know the methods of prenatal diagnosis of genetic diseases.



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

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.



A microscopic image of plant cells, showing a grid-like structure of cells with thick, brownish cell walls. The cells are roughly hexagonal or polygonal in shape. The background is a light, pale color.

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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”

Management



Cano Armenteros, Montserrat

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

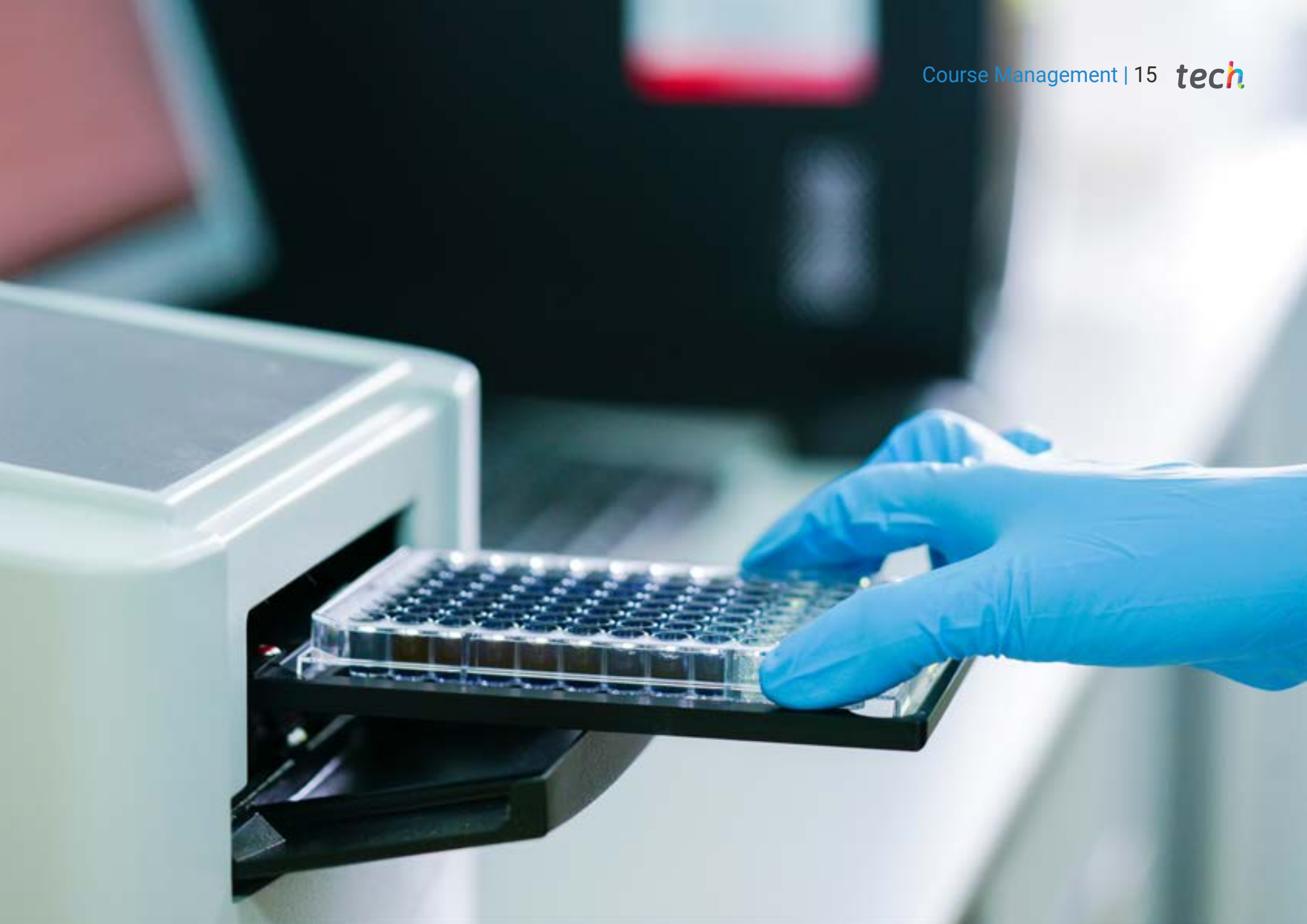
Professors

Dr. Calle Guisado, Violeta

- ♦ PhD in Public and Animal Health from the University of Extremadura. Cum Laude Mention and International PhD obtained in July 2019 and Outstanding Award in her PhD in 2020.
- ♦ Degree in Biology from the University of Extremadura, 2012.

Aparicio Fernández, Cristina

- ♦ Degree in Biotechnology with a Master's Degree in Advanced Immunology.
- ♦ Inter-University Master's Degree in Advanced Immunology from the University of Barcelona and the Autonomous University of Barcelona in 2020.
- ♦ Degree in Biotechnology from the University of León (2019).



04

Structure and Content

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





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

Module 1. Instrumental Techniques in the Clinical Analysis Laboratory

- 1.1. Instrumental Techniques in Clinical Analysis
 - 1.1.1. Introduction
 - 1.1.2. Main Concepts
 - 1.1.3. Classification of Instrumental Methods
 - 1.1.3.1. Classic Methods
 - 1.1.3.2. Instrumental Methods
 - 1.1.4. Preparation of Reagents, Solutions, Buffers and Controls
 - 1.1.5. Equipment Calibration
 - 1.1.5.1. Importance of Calibration
 - 1.1.5.2. Methods of Calibration
 - 1.1.6. Clinical Analysis Process
 - 1.1.6.1. Reasons for Requesting a Clinical Analysis
 - 1.1.6.2. Phases of the Analysis Process
 - 1.1.6.3. Patient Preparation and Sample Taking
- 1.2. Microscopic Techniques in Clinical Analysis
 - 1.2.1. Introduction and Concepts
 - 1.2.2. Types of Microscopes
 - 1.2.2.1. Optical Microscopes
 - 1.2.2.2. Electronic Microscopes
 - 1.2.3. Lenses, Light and Image Formation
 - 1.2.4. Management and Maintenance of Light Optical Microscopes
 - 1.2.4.1. Handling and Properties
 - 1.2.4.2. Maintenance
 - 1.2.4.3. Observation Incidents
 - 1.2.4.4. Application in Clinical Analysis
 - 1.2.5. Other Microscopes Characteristics and Management
 - 1.2.5.1. Dark Field Microscope
 - 1.2.5.2. Polarized Light Microscope
 - 1.2.5.3. Interference Microscope
 - 1.2.5.4. Inverted Microscope
 - 1.2.5.5. Ultraviolet Light Microscope
 - 1.2.5.6. Fluorescence Microscope
 - 1.2.5.7. Electronic Microscope





- 1.3. Microbiological Techniques in Clinical Analysis
 - 1.3.1. Introduction and Concept
 - 1.3.2. Design and Work Standards of the Clinical Microbiology Laboratory
 - 1.3.2.1. Necessary Rules and Resources
 - 1.3.2.2. Routines and Procedures in the Laboratory
 - 1.3.2.3. Sterilization and Contamination
 - 1.3.3 Cellular Culture Techniques
 - 1.3.3.1. Growth Environment
 - 1.3.4 Most Commonly Used Extension and Staining Procedures in Clinical Microbiology
 - 1.3.4.1. Bacteria Recognition
 - 1.3.4.2. Cytological
 - 1.3.4.3. Other Procedures
 - 1.3.5 Other Methods of Microbiological Analysis
 - 1.3.5.1. Direct Microscopic Examination Identification of Normal and Pathogenic Flora
 - 1.3.5.2. Identification by Biochemical Tests
 - 1.3.5.3. Rapid Immunological Test
- 1.4. Volumetric, Gravimetric, Electrochemical and Titration Techniques
 - 1.4.1. Volumetrics Introduction and Concept
 - 1.4.1.1. Classification of Methods
 - 1.4.1.2. Laboratory Procedure to Perform a Volumetric Analysis
 - 1.4.2. Gravimetry
 - 1.4.2.1. Introduction and Concept
 - 1.4.2.2. Classification of Gravimetric Methods
 - 1.4.2.3. Laboratory Procedure to Perform a Gravimetric Analysis
 - 1.4.3. Electrochemical Techniques
 - 1.4.3.1. Introduction and Concept
 - 1.4.3.2. Potentiometry
 - 1.4.3.3. Amperometry
 - 1.4.3.4. Coulometry
 - 1.4.3.5. Conductometry
 - 1.4.3.6. Application in Clinical Analysis

- 1.4.4. Evaluation
 - 1.4.4.1. Acid Base
 - 1.4.4.2. Precipitation
 - 1.4.4.3. Complex Formation
 - 1.4.4.4. Application in Clinical Analysis
- 1.5. Spectral Techniques in Clinical Analysis
 - 1.5.1. Introduction and Concepts
 - 1.5.1.1. Electromagnetic Radiation and its Interaction with the Material
 - 1.5.1.2. Radiation Absorption and Emission
 - 1.5.2. Spectrophotometry Application in Clinical Analysis
 - 1.5.2.1. Instruments
 - 1.5.2.2. Procedure
 - 1.5.3. Atomic Absorption Spectrophotometry
 - 1.5.4. Flame Emission Photometry
 - 1.5.5. Fluorimetry
 - 1.5.6. Nephelometry and Turbidimetry
 - 1.5.7. Mass and Reflectance Spectrometry
 - 1.5.7.1. Instruments
 - 1.5.7.2. Procedure
 - 1.5.8. Applications of the Most Common Spectral Techniques Currently Used in Clinical Analysis
- 1.6. Immunoanalysis Techniques in Clinical Analysis
 - 1.6.1. Introduction and Concepts
 - 1.6.1.1. Immunological Concepts
 - 1.6.1.2. Types of Immunoanalysis
 - 1.6.1.3. Cross-Reactivity and Antigen
 - 1.6.1.4. Detection Molecules
 - 1.6.1.5. Quantification and Analytical Sensitivity
 - 1.6.2. Immunohistochemical Techniques
 - 1.6.2.1. Concept
 - 1.6.2.2. Immunohistochemical Procedures
 - 1.6.3. Enzyme Immunohistochemical Technique
 - 1.6.3.1. Concept and Procedure
 - 1.6.4. Immunofluorescence
 - 1.6.4.1. Concept and Classification
 - 1.6.4.2. Immunofluorescence Procedure
 - 1.6.5. Other Methods of Immunoanalysis
 - 1.6.5.1. Immunophelometry
 - 1.6.5.2. Radial Immunodiffusion
 - 1.6.5.3. Immunoturbidimetry
- 1.7. Separation Techniques in Clinical Analysis Chromatography and Electrophoresis
 - 1.7.1. Introduction and Concepts
 - 1.7.2. Chromatographic Techniques
 - 1.7.2.1. Principles, Concepts and Classification
 - 1.7.2.2. Gas-Liquid Chromatography Concepts and Procedure
 - 1.7.2.3. High Efficacy Liquid Chromatography Concepts and Procedure
 - 1.7.2.4. Thin Layer Chromatography
 - 1.7.2.5. Application in Clinical Analysis
 - 1.7.3. Electrophoretic Techniques
 - 1.7.3.1. Introduction and Concepts
 - 1.7.3.2. Instruments and Procedures
 - 1.7.3.3. Purpose and Field of Application in Clinical Analysis
 - 1.7.3.4. Capillary Electrophoresis
 - 1.7.3.4.1. Serum Protein Electrophoresis
 - 1.7.4. Hybrid Techniques: ICP masses, Gases masses and Liquids masses
- 1.8. Molecular Biology Techniques in Clinical Analysis
 - 1.8.1. Introduction and Concepts
 - 1.8.2. DNA and RNA Extraction Techniques
 - 1.8.2.1. Procedure and Conservation
 - 1.8.3. Chain Reaction of PCR Polymers
 - 1.8.3.1. Concept and Foundation
 - 1.8.3.2. Instruments and Procedures
 - 1.8.3.3. Modifications of the PCR Method

- 1.8.4. Hybridization Techniques
- 1.8.5. Sequencing
- 1.8.6. Protein Analysis by Western Blotting
- 1.8.7. Proteomics and Genomics
 - 1.8.7.1. Concepts and Procedures in Clinical Analysis
 - 1.8.7.2. Types of Proteomic Studies
 - 1.8.7.3. Bioinformation and Proteomic
 - 1.8.7.4. Metabolomics
 - 1.8.7.5. Relevance in Biomedicine
- 1.9. Techniques for the Determination of Form Elements Flow Cytometry Bedside Testing
 - 1.9.1. Red Blood Cells Count
 - 1.9.1.1. Cellular Count Procedure.
 - 1.9.1.2. Pathologies Diagnosed with this Methodology
 - 1.9.2. Leukocyte Count
 - 1.9.2.1. Procedure
 - 1.9.2.2. Pathologies Diagnosed with this Methodology
 - 1.9.3. Flow Cytometry
 - 1.9.3.1. Introduction and Concepts
 - 1.9.3.2. Technique Procedure
 - 1.9.3.3. Cytometry Tehniques in Clinical Analysis
 - 1.9.3.3.1. Applications in Oncohematology
 - 1.9.3.3.2. Applications in Allergies
 - 1.9.3.3.3. Applications in Infertility
 - 1.9.4. Bedside Testing
 - 1.9.4.1. Concept
 - 1.9.4.2. Types of Samples
 - 1.9.4.3. Techniques Used
 - 1.9.4.4. Most Used Applications in Bedside Testing

- 1.10. Interpretation of Results, Analytical Method Evaluation and Analytical Interferences
 - 1.10.1. Laboratory Report
 - 1.10.1.1. Concept
 - 1.10.1.2. Characteristic Elements of a Laboratory Report
 - 1.10.1.3. Interpretation of the Report
 - 1.10.2. Evaluation of Analytical Methods in Clinical Analysis
 - 1.10.2.1. Concepts and Objectives
 - 1.10.2.2. Linearity
 - 1.10.2.3. Truthfulness
 - 1.10.2.4. Precision
 - 1.10.3. Analytical Interferences
 - 1.10.3.1. Concept, Foundation and Classification
 - 1.10.3.2. Endogenous Interferents
 - 1.10.3.3. Exogenous Interferents
 - 1.10.3.4. Procedures for Detecting and Quantifying an Interference in a Specific Method or Analysis

Module 2. Biochemistry II

- 2.1. Congenital Alterations of Carbohydrate Metabolism
 - 2.1.1. Alterations in the Digestion and Intestinal Absorption of Carbohydrates
 - 2.1.2. Galactose Metabolism Alterations
 - 2.1.3. Fructose Metabolism Alterations
 - 2.1.4. Glucogen Metabolism Alterations
 - 2.1.4.1. Glucogenesis: Types
- 2.2. Congenital Alterations of Amino Acid Metabolism
 - 2.2.1. Aromatic Amino Acid Metabolism Alterations
 - 2.2.1.1. Phenylketonuria.
 - 2.2.1.2. Glutaric Aciduria Type 1
 - 2.2.2. Alterations of Branched Amino Acid Metabolism
 - 2.2.2.1. Maple Syrup Urine Disease
 - 2.2.2.2. Isovaleric Acidemia
 - 2.2.3. Alterations in the Metabolism of Sulfur Amino Acids
 - 2.2.3.1. Homocysturia

- 2.3. Congenital Alterations of Lipid Metabolism
 - 2.3.1. Beta-Oxidation of Fatty Acids
 - 2.3.1.1. Introduction to Beta-Oxidation of Fatty Acids
 - 2.3.1.2. Fatty Acid Beta-Oxidation Alterations
 - 2.3.2. Carnitine Cycle
 - 2.3.2.1. Introduction to Carnitine Cycle
 - 2.3.2.2. Carnitine Cycle Alterations
- 2.4. Urea Cycle Disorders
 - 2.4.1. Urea Cycle
 - 2.4.2. Genetic Alterations of the Urea Cycle
 - 2.4.2.1. Ornithine Transcarbamylase (OTC) Deficiency
 - 2.4.2.2. Other Urea Cycle Disorders
 - 2.4.3. Diagnosis and Treatment of Urea Cycle Diseases
- 2.5. Molecular Pathologies of Nucleotide Bases Alterations of Purine and Pyrimidine Metabolism
 - 2.5.1. Introduction to Purine and Pyrimidine Metabolism
 - 2.5.2. Purine Metabolism Disorders
 - 2.5.3. Pyrimidine Metabolism Disorders.
 - 2.5.4. Diagnosis of Purine and Pyrimidine Disorders
- 2.6. Porphyrrias. Alterations in the Synthesis of the Heme Group
 - 2.6.1. Heme Group Synthesis
 - 2.6.2. Porphyrrias: Types
 - 2.6.2.1. Liver Porphyrrias
 - 2.6.2.1.1. Acute Porphyrrias
 - 2.6.2.2. Hematopoietic Porphyrrias
 - 2.6.3. Diagnosis and Treatment of Porphyrrias
- 2.7. Jaundice Bilirubin Metabolism Disorders
 - 2.7.1. Introduction to Bilirubin Metabolism
 - 2.7.2. Congenital Jaundice
 - 2.7.2.1. Unconjugated hyperbilirubinaemia
 - 2.7.2.2. Conjugated Hyperbilirubinemia
 - 2.7.3. Diagnosis and Treatment of Jaundice
- 2.8. Oxidative Phosphorylation
 - 2.8.1. Mitochondria
 - 2.8.1.1. Mitochondrial Enzyme and Protein Constituents
 - 2.8.2. Electronic Transport Chain
 - 2.8.2.1. Electronic Transporters
 - 2.8.2.2. Electronic Complexes
 - 2.8.3. Coupling of Electronic Transport to ATP Synthesis
 - 2.8.3.1. ATP Synthase
 - 2.8.3.2. Oxidative Phosphorylation Uncoupling Agents
 - 2.8.4. NADH Shuttle
- 2.9. Mitochondrial Disorders
 - 2.9.1. Maternal Inheritance
 - 2.9.2. Heteroplasmy and Homoplasmy
 - 2.9.3. Mitochondrial Diseases
 - 2.9.3.1. Leber Hereditary Optic Neuropathy
 - 2.9.3.2. Leigh Disease
 - 2.9.3.3. MELAS Syndrome
 - 2.9.3.4. Myoclonic Epilepsy with Ragged Red Fibers (MERRF)
 - 2.9.4. Diagnosis and Treatment of Mitochondrial Diseases
- 2.10. Other Disorders Produced by Alterations in Other Organelles
 - 2.10.1. Lysosomes
 - 2.10.1.1. Lysosomal Diseases
 - 2.10.1.1.1. Sphingolipidosis
 - 2.10.1.1.2. Mucopolysaccharidosis
 - 2.10.2. Peroxisomes
 - 2.10.2.1. Lysosomal Diseases
 - 2.10.2.1.1. Zellweger Syndrome
 - 2.10.3. Golgi Apparatus
 - 2.10.3.1. Golgi Apparatus Diseases
 - 2.10.3.1.1. Mucopolipidosis II

Module 3. Genetics

- 3.1. Introduction to Genetic Medicine Genealogies and Inheritance Patterns
 - 3.1.1. Historical Development of Genetics Key Concepts
 - 3.1.2. Structure of Genes and Regulation of Genetic Expression Epigenetics
 - 3.1.3. Genetic Variability Mutation and Repair of DNA
 - 3.1.4. Human Genetics Organization of the Human Genome
 - 3.1.5. Genetic Diseases Morbidity and Mortality
 - 3.1.6. Human Inheritance Concept of Genotype and Phenotype
 - 3.1.6.1. Mendelian Inheritance Patterns
 - 3.1.6.2. Multigene and Mitochondrial Inheritance
 - 3.1.7. Construction of Genealogies
 - 3.1.7.1. Allele, Genotypic and Phenotypic Frequency Estimation
 - 3.1.8. Other Factors which Affect the Phenotype
- 3.2. Molecular Biology Techniques Used in Genetics
 - 3.2.1. Genetics and Molecular Diagnostics
 - 3.2.2. Polymerase Chain Reaction (PCR) Applied to Diagnosis and Research in Genetics
 - 3.2.2.1. Detection and Amplification of Specific Sequences
 - 3.2.2.2. Quantification of Nucleic Acids (RT-PCR)
 - 3.2.3. Cloning Techniques: Isolation, Restriction and Ligation of DNA Fragments
 - 3.2.4. Detection of Mutations and Measurement of Genetic Variability: RFLP, VNTR, SNPs
 - 3.2.5. Mass Sequencing Techniques. NGS
 - 3.2.6. Transgenesis Genetic Therapy
 - 3.2.7. Cytogenetic Techniques
 - 3.2.8.1. Chromosome Banding
 - 3.2.8.2. FISH, CGH
- 3.3. Human Cytogenetics Numerical and Structural Chromosomal Abnormalities
 - 3.3.1. Study of Human Cytogenetics Features
 - 3.3.2. Chromosome Characterization and Cytogenetic Nomenclature
 - 3.3.2.1. Chromosomal Analysis: Karyotype.
 - 3.3.3. Anamolies in the Number of Chromosomes
 - 3.3.3.1. Polyploidies
 - 3.3.3.2. Aneuploidies
 - 3.3.4. Structural Chromosomal Alterations Genetic Dosis
 - 3.3.4.1. Deletions
 - 3.3.4.2. Duplications
 - 3.3.4.3. Inversions
 - 3.3.4.4. Translocations
 - 3.3.5. Chromosomal Polymorphisms
 - 3.3.6. Genetic Imprinting
- 3.4. Prenatal Diagnosis of Genetic Alterations and Congenital Defects Preimplantational Genetic Diagnosis
 - 3.4.1. Prenatal Diagnosis. What does it entail?
 - 3.4.2. Incidence of Congenital Defects
 - 3.4.3. Indications for Performing Prenatal Diagnosis
 - 3.4.4. Prenatal Diagnostic Methods
 - 3.4.2.1. Non-Invasive Procedures: First and Second Trimester Screening TPNI
 - 3.4.2.2. Invasive Procedures: Amniocentesis, Cordocentesis and Chorionic Biopsy
 - 3.4.5. Preimplantational Genetic Diagnosis Indications.
 - 3.4.6. Embryo Biopsy and Genetic Analysis
- 3.5. Genetic Diseases I
 - 3.5.1. Diseases with Autosomal Dominant Inheritance
 - 3.5.1.1. Achondroplasia
 - 3.5.1.2. Huntington's Disease
 - 3.5.1.3. Retinoblastoma
 - 3.5.1.4. Charcot-Marie-Tooth Disease

- 3.5.2. Diseases with Autosomal Recessive Inheritance
 - 3.5.2.1. Phenylketonuria.
 - 3.5.2.2. Sickle Cell Anemia
 - 3.5.2.3. Cystic Fibrosis
 - 3.5.2.4. Laron Syndrome
- 3.5.3. Diseases with Sex-Linked Inheritance
 - 3.5.3.1. Rett Syndrome
 - 3.5.3.2. Haemophilia
 - 3.5.3.3. Duchenne Muscular Dystrophy
- 3.6. Genetic Diseases II
 - 3.6.1. Mitochondrial Inheritance Diseases
 - 3.6.1.1. Mitochondrial Encephalomyopathies
 - 3.6.1.2. Leber Hereditary Optic Neuropathy (NOHL)
 - 3.6.2. Genetic Anticipation Phenomena
 - 3.6.2.1. Huntington's Disease
 - 3.6.2.2. Fragile X Syndrome
 - 3.6.2.3. Spinocerebellar Ataxias
 - 3.6.3. Allelic Heterogeneity
 - 3.6.3.1. Usher Syndrome
- 3.7. Complex Diseases Genetics Molecular Basis of Family and Sporadic Cancer
 - 3.7.1. Multifactorial Inheritance
 - 3.7.1.1. Polygenes
 - 3.7.2. Contribution of Environmental Factors on Complex Diseases
 - 3.7.3. Quantative Genetics
 - 3.7.3.1 Heritability
 - 3.7.4. Common Complex Diseases
 - 3.7.4.1. Diabetes Mellitus
 - 3.7.4.2. Alzheimer's Disease
 - 3.7.5. Behavioral Diseases and Personality Disorders: Alcoholism, Autism and Schizophrenia
 - 3.7.6. Cancer: Molecular Base and Environmental Factors
 - 3.7.6.1. Genetics of Cell Proliferation and Differentiation Processes Cellular Cycle
 - 3.7.6.2. DNA Repairation Genes, Oncogenes and Tumor Suppressor Genes
 - 3.7.6.3. Environmental Influence of the Occurence of Cancer
 - 3.7.7. Familial Cancer
- 3.8 Genomics and Proteomics
 - 3.8.1. Omic Sciences and their Usefulness in Medicine
 - 3.8.2. Genome Sequencing and Analysis
 - 3.8.2.1. DNA Libraries
 - 3.8.3. Comparative Genomics
 - 3.8.3.1. Organisms Model
 - 3.8.3.2. Sequencing Comparison
 - 3.8.3.3. Human Genome Project
 - 3.8.4. Functional Genomics
 - 3.8.4.1. Transcriptomics
 - 3.8.4.2. Structural and Functional Organization of the Genome
 - 3.8.4.3. Functional Genomic Elements
 - 3.8.5. From the Genome to the Proteome
 - 3.8.5.1. Post-Translational Modifications
 - 3.8.5. Strategies for the Separation and Purification of Proteins
 - 3.8.6. Identification of Proteins
 - 3.8.8. Interactom
- 3.9. Genetic Assessment Ethical and Legal Aspects of Diagnosis and Research in Genetics
 - 3.9.1. Genetic Assessment Concepts and Base Techniques
 - 3.9.1.1. Risk of Recurrence of Genetically-Based Diseases
 - 3.9.1.2. Genetic Assessment in Prenatal Diagnosis
 - 3.9.1.3. Ethical Principles in Genetic Assessment

- 3.9.2. Legislation of New Genetic Technology
 - 3.9.2.1. Genetic Engineering
 - 3.9.2.2. Human Cloning
 - 3.9.2.3. Genetic Therapy
- 3.9.3. Bioethics and Genetics
- 3.10. Biobanks and Bioinformatics Tools
 - 3.10.1. Biobanks Concept and Functions
 - 3.10.2. Organization, Management and Quality of Biobanks
 - 3.10.3. Spanish Network of Biobanks
 - 3.10.4. Computational Biology
 - 3.10.5. Big Data and Machine Learning
 - 3.10.6. Bioinformatics Applications in Biomedicine
 - 3.10.6.1. Sequences Analysis
 - 3.10.6.2. Image Analysis
 - 3.10.6.2. 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 training program provides you with a different way of learning. Our methodology uses a cyclical learning approach: ***Re-learning***.

This teaching system is used 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 Re-learning, 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

In a given situation, what would you do? Throughout the program you will be presented with multiple simulated clinical cases based on real patients, where you will have to investigate, establish hypotheses and, finally, resolve the situation. There is abundant scientific evidence on the effectiveness of the method. Specialists learn better, faster, and more sustainably over time.

With TECH you can experience a way of learning that is shaking the foundations of traditional universities around the world.



According to Dr. Gervas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching potential 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 professional medical 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 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 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.



Re-Learning Methodology

At TECH we enhance the Harvard case method with the best 100% online teaching methodology available: Re-learning.

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 Re-learning method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best Spanish-speaking online university (Columbia University).

With this methodology we have trained more than 250,000 physicians with unprecedented success, in all clinical specialties regardless of the surgical load. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

Re-learning 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 (we learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically.

The overall score obtained by our learning system is 8.01, according to the highest international standards.



In this program you will have access to the best educational material, prepared with you in mind:



Study Material

All teaching material is produced specifically for the course by the specialists who teach the course, so that the teaching content is highly specific and precise.

This content is then adapted in an audiovisual format that will create our way of working online, with the latest techniques that allow us to offer you high quality in all of the material that we provide you with.



Latest 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 this, in first person, with the maximum rigor, explained and detailed for your assimilation and understanding. And best of all, you can watch them as many times as you want.



Interactive Summaries

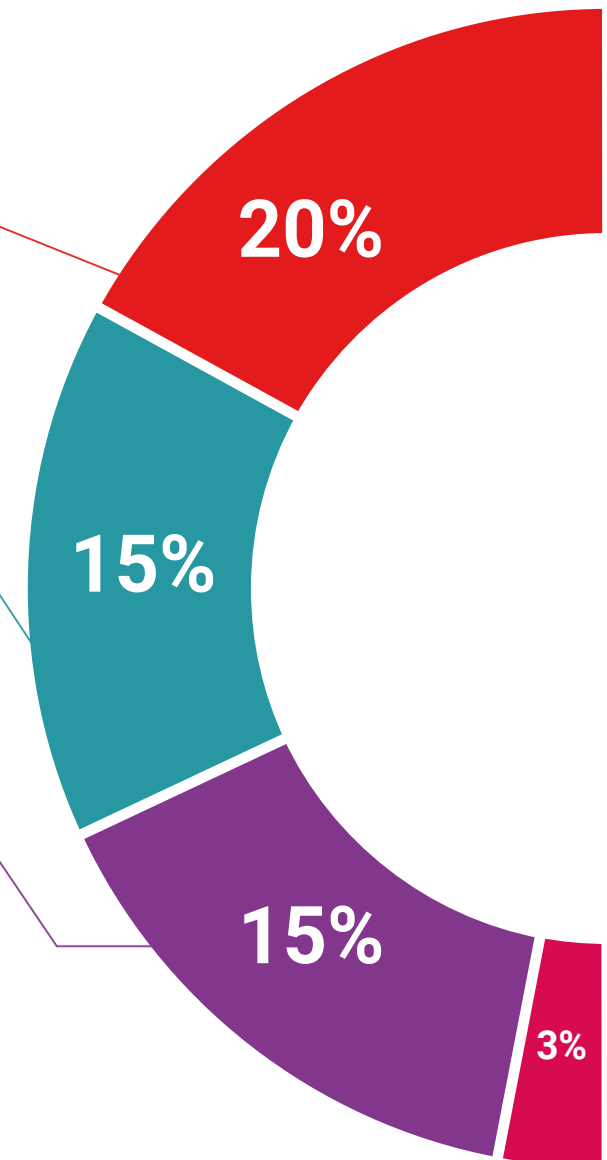
We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

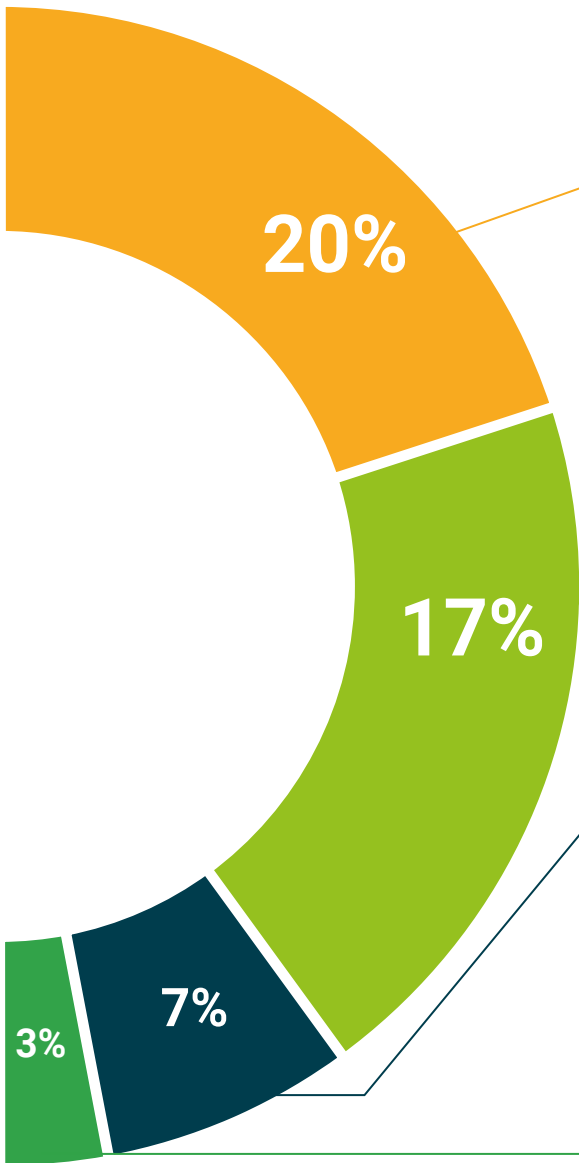
This unique multimedia content presentation training system was awarded by Microsoft as a "European Success Story".



Additional Reading

Recent articles, consensus documents, international guides. in our virtual library you will have access to everything you need to complete your training.





Expert-Led Case Studies and Case Analysis

Effective learning ought to be contextual. Therefore, we will present you with real case developments in which the expert will guide you through focusing on and solving the different situations: a clear and direct way to achieve the highest degree of understanding.



Testing & Re-Testing

We periodically evaluate and re-evaluate your knowledge throughout the program, through assessment and self-assessment activities and exercises: so that you can see how you are achieving your 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 our future difficult decisions.



Quick Action Guides

We offer you the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical, and effective way to help you progress in your 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 Diploma in Biotechnology in the Field of Clinical Analysis: a highly qualified added value for any medical professional"

This **Postgraduate Diploma in Biotechnology in the Field of Clinical Analysis** contains the most complete and up-to-date scientific program on the market.

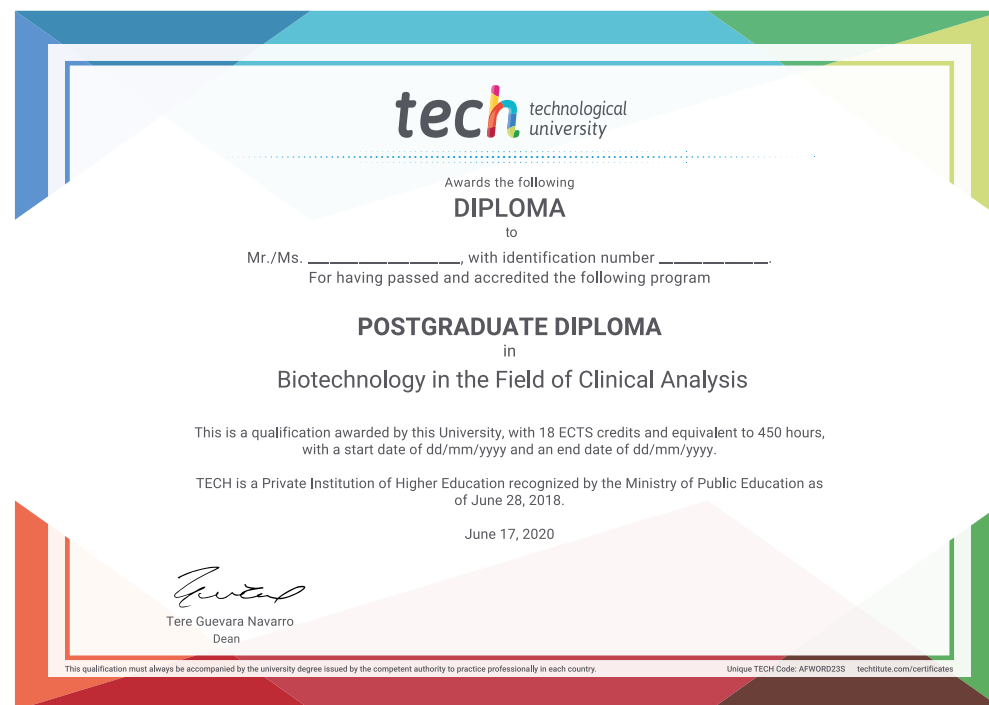
After students have passed the assessments, they will receive their **Postgraduate Certificate** issued by **TECH Technological University**.

The certificate issued by **TECH Technological University** will specify the qualification obtained through the Postgraduate Diploma, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Postgraduate Diploma in Biotechnology in the Field of Clinical Analysis**

ECTS: **18**

Official Number of Hours: **450**



*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.

health future
confidence people
education information tutors
guarantee accreditation teaching
institutions technology learning
community commitment
personalized service innovation
knowledge present quality
development languages
virtual classroom



Postgraduate Diploma
Biotechnology in the
Field of Clinical Analysis

Course Modality: Online

Duration: 6 months.

Certificate: TECH Technological University

18 ECTS Credits

Teaching Hours: 450 hours.

Postgraduate Diploma

Biotechnology
in the Field of Clinical
Analysis

