Postgraduate Diploma

Biomedicine in the Field of Clinical Analysis

tech technological university

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Postgraduate Diploma

Biomedicine 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/pk/wwwww'0medicine/postgraduate-diploma/postgraduate-diploma-biomedicine-field-clinical-analysis

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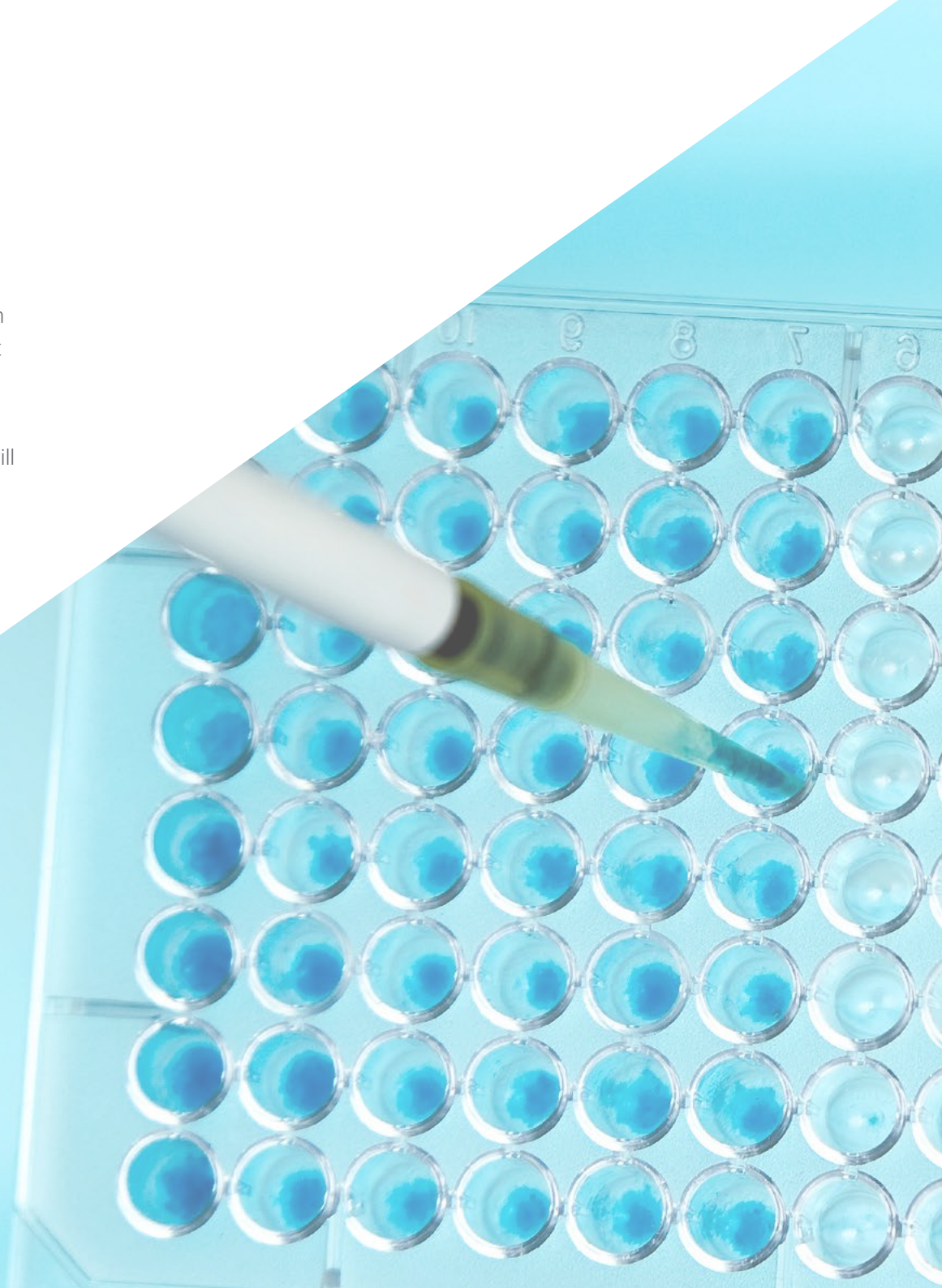
01

Introduction

Biomedicine has become one of the fields of work with the greatest scientific impact in recent times. In the field of clinical analysis this field has a special relevance because it is the cornerstone of diagnostics and research.

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.



Acquire the necessary specialist skills in order to compete among the best in Biomedicine in the Field of Clinical Analysis with this top level academic and technological specialist course"

This Postgraduate Diploma brings together the most specialized and up-to-date theoretical contents currently available in comparison to other programs of similar subject matter. Furthermore, in this particular module, the associated theoretical and practical material is of vital importance, since the explanation of the techniques and their full understanding requires a large amount of visual and pedagogical support material of the highest quality. This is the innovative methodology that distinguishes us from others.

This intense course provides the clinician with specialized knowledge in the approach to blood pathologies, both oncologic and non-oncologic or benign, with the aim of obtaining the necessary tools to make an adequate differential diagnosis of the different hemopathologies.

Throughout the Postgraduate Diploma, we will also address laboratory studies with the analysis and peripheral blood smear and other more complex tests, allowing a comprehensive and specialized diagnosis of the most relevant hematological diseases.

Other areas that the student will cover are the immune system, its molecular and cellular components and the interactions that occur between them in order to organize the immune response. We will analyze the immune mechanisms responsible for pathologies such as hypersensitivity, autoimmunity, transplants, immunodeficiency or cancer. And finally, establish the immunoanalytical techniques most commonly used in a clinical analysis laboratory setting.

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

This **Postgraduate Diploma in Biomedicine 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.
- 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.
- 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.

Perfectly combine high intensity training with your personal and professional life, achieving your goals in a simple and real way"

Acquire the professional skills of an expert in Biomedicine in the Field of Clinical Analysis and gain a competitive edge and the best job prospects"

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 Biomedicine 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.

The design of this program is based on Problem-Based Learning: an approach that conceives 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 actually dealing with the scenario you are learning about. 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 who are experts in this field of work, which makes this course a unique opportunity for professional growth.

The learning in this Postgraduate Diploma is developed through the most performed didactic methods in online teaching to guarantee that your efforts produce the best results possible.

02

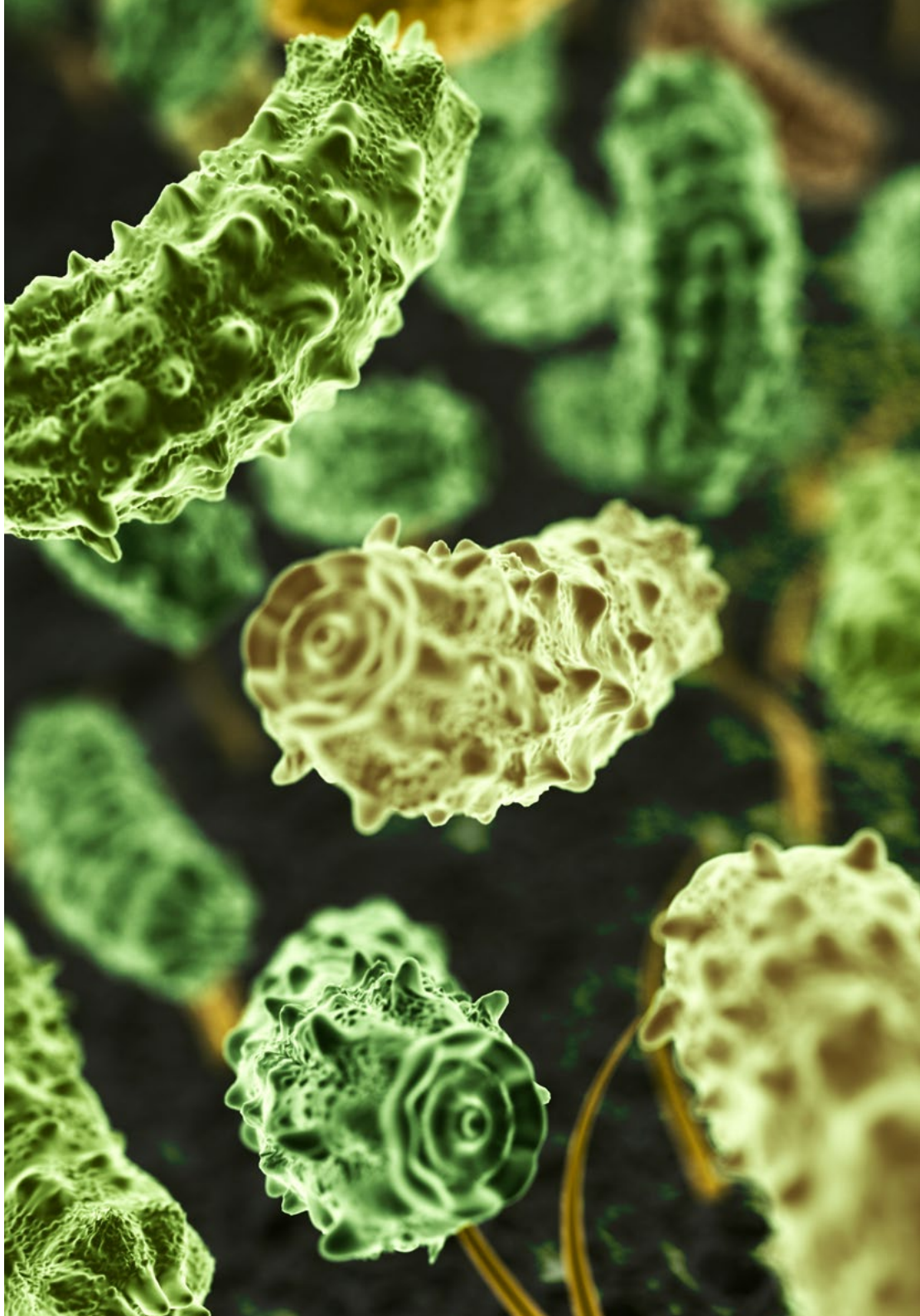
Objectives

The Postgraduate Diploma in Biomedicine in the Field of Clinical Analysis is aimed at facilitating the medical professional's performance with the latest advances and most innovative treatments in the sector.

With this Postgraduate Diploma, you will be able to specialize in Biomedicine in the Field of Clinical Analysis and learn about the latest advances in the subject"

General Objectives

- Consolidate and broaden knowledge of immunology in the context of clinical analysis.
- Interrelate knowledge of immunology to address problems from different perspectives.
- Develop critical thinking skills to interpret and discuss analytical results.
- Gain skills in autonomous learning and ability to transmit the knowledge you have acquired on immunology.
- Identify the main hematological alterations in analytical tests.
- Propose the essential complimentary examinations for the clinical approach in patients with a hematological diseases.
- Correlate laboratory findings with clinical entities.
- Establish differential diagnosis of the main blood dyscrasias.
- Analyze and carry out the instrumental techniques and sample collection processes that specifically apply to medical clinical analysis laboratories as well as understanding the basics and the correct management of the necessary instruments.
- Apply the instrumental techniques in the resolution of problems in health analysis.
- Gain specialized knowledge to carry out the tasks specific to a clinical analysis laboratory in terms of the implementation of new analytic methods and the monitoring the quality of those already implemented.
- Define the procedures used in clinical analysis laboratories for the use of different techniques as well as for sample collection and those aspects related to validation, calibration, automization and processing of the information obtained from the procedures.



Specific Objectives

- Compile the instrumental techniques used in a clinical analysis laboratory.
- Determine the procedures involved in microscopic, microbiological, spectral, molecular biology, separation and cell counting techniques.
- Develop the fundamental theoretical concepts for the understanding of in-depth instrumental techniques.
- Establish the direct applications of instrumental techniques of clinical analysis in human health as a diagnostic and preventive element.
- Analyze the process prior to the use of the instrumental techniques to be developed in the clinical analysis laboratory.
- Justify the rationale for using one practice over another based on diagnostic, staffing, management and other factors.
- Propose a practical learning of instrumental techniques through the use of clinical cases, practical examples and exercises.
- Evaluate the information obtained from the use of instrumental techniques for the interpretation of results.
- Determine the quantitative and qualitative alterations of the different blood cells.
- Deepen understanding of peripheral blood smears of red blood series alterations.
- Identify white blood cell abnormalities and their main causes.
- Present the most frequent platelet disorders.
- Propose a differential diagnosis of myelodysplastic and myeloproliferative syndromes.
- Analyze the complementary tests for the initial evaluation of acute leukemias.
- Establish a differential diagnosis of the main acute and chronic lymphoid neoplasms.
- Identify the various coagulation pathologies.
- Establish appropriate guidelines for transfusion procedures.
- Define the molecular and cellular components and organ organization of the immune system.
- Analyze innate and adaptive immune responses, both humoral and cellular based.
- Examine the immunological processes that occur in pathological processes such as cancer, transplantation, autoimmunity and allergies.
- Apply and integrate the most commonly used immunoanalytical techniques in clinical analysis.
- Diagnose alterations of the immune system based on the evaluation of the analytical results obtained.
- Develop integrated thinking and critical reasoning for immunological problem solving.
- Propose and design new experiments to improve or incorporate new immunological techniques, as well as to know their limitations.

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

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

Management

Cano Armenteros, Montserrat

- Bachelor's Degree in Biology. University of Alicante.
- Master'a Degree in Clinical Trials University of Seville.
- Official Professional 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

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).

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.

Dr. Carmona Talavera, Diego

- Degree in Biochemistry from the University of Córdoba(2014)
- Specialist in Clinical Analysis (2020)
- Master's Degree on the Theoretical Basis and Laboratory Procedures of Assisted Reproduction from the University of Valencia (2019)
- Postgraduate Diploma in Medical Genetics and Genomics from the San Antonio Catholic University of Murcia (2020)
- Specialist Diploma in Health Services Management from the University of Seville (2019)
- Cytology, Histology and Embryology Professor at GoBIR Academy (2019)
- Site Coordinator at GoFIR Academy in Valencia (since 2019)
- Professor of Biochemistry, Molecular Biology and Genetics at GoFIR Academy (since the 2017 academic year)
- Clinical Analysis Specialist, Head of the Laboratory of the Vithas Valencia Consuelo Hospital (July - November 2020)
- Member of the AEFA New Specialists Commission (since July 2020)
- Resident member of the National Commission of Clinical Analysis (since May 2018)
- Resident Internal Biochemist of Clinical Analysis at the UH. Dr. Peset de Valencia (2016-2020).
- MECD Collaboration Grant in the Department of Biochemistry and Molecular Biology of the UCO (academic year 2013-2014).

04

Structure and Content

The contents of this Postgraduate Diploma course 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.

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

A high-intensity specialized training that will allow you to acquire the necessary skills to work safely and competently in this interesting field"

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. Hematology

2.1. Introduction to the Hematopoietic System and Study Techniques
2.1.1. Classification of Blood Cells and Hematopoiesis
2.1.2. Hemacytometry and Blood Smear Study
2.1.3. Bone Marrow Study
2.1.4. Role of Immunophenotyping in the Diagnosis of Hematological Diseases
2.1.5. Cytogenetics and Molecular Biology in Hematologic Diagnosis

2.2. Diagnosis of Erythrocyte Disorders Anemias, Erythrocytosis, Hemoglobinopathies and Thalassemias
2.2.1. Classification of the Types of Anaemia
2.2.1.1. Etiopathogenic Classification
2.2.1.2. Classification According to VCM
2.2.1.2.1. Microcytic Anemia
2.2.1.2.2. Normocytic Anemia
2.2.1.2.3. Macrocytic Anemia
2.2.2. Erythrocytosis Differential Diagnosis
2.2.2.1. Primary Erythrocytosis
2.2.2.2. Secondary Erythrocytosis
2.2.3. Hemoglobinopathies and Thalassemias
2.2.3.1. Classification
2.2.3.2. Laboratory Diagnosis

2.3. Quantitative Alterations of the White Series
- 2.3.1. Neutrophils: Neutropenia and Neutrophilia
- 2.3.2. Lymphocytes: Lymphopenia and Lymphocytosis

2.4. Diagnosis of Platelet Disorders
- 2.4.1. Morphologic Alterations: Thrombocytopathies
- 2.4.2. Thrombocytopenia Diagnostic Approximation

2.5. Myeloproliferative and Myelodysplastic Syndromes
- 2.5.1. Laboratory Findings and Complementary Examinations
  - 2.5.1.1. Hemogram and Peripheral Blood Smear
  - 2.5.1.2. Bone Marrow Study
    - 2.5.1.2.1. Bone Marrow Morphology
    - 2.5.1.2.2. Flow Cytometry
    - 2.5.1.2.3. Cytogenetics
    - 2.5.1.2.4. Molecular Biology
- 2.5.2. Diagnosis Classification Differential Diagnosis

2.6. Monoclonal Gammopathies Multiple Myeloma
- 2.6.1. Study of Monoclonal Gammopathies
  - 2.6.1.1. Bone Marrow Morphology
  - 2.6.1.2. Study of the Monoclonal Component
  - 2.6.1.3. Other Laboratory Studies
- 2.6.2. Classification of Monoclonal Gammopathies Differential Diagnosis
  - 2.6.2.1. Monoclonal Gammopathy of Uncertain Significance and Quiescent Myeloma
  - 2.6.2.2. Multiple Myeloma
    - 2.6.2.2.1. Diagnostic Criteria.
  - 2.6.2.3. Amyloidosis
  - 2.6.2.4. Waldenström's Macroglobulinemia

2.7. Differential Diagnosis of Acute Leukemia
- 2.7.1. Acute Myeloid Leukemia Promyelocytic Leukemia
  - 2.7.1.1. Laboratory Findings and Complementary Examinations
  - 2.7.1.2. Hemogram and Peripheral Blood Smear
  - 2.7.1.3. Bone Marrow Study
    - 2.7.1.3.1. Bone Marrow Morphology
    - 2.7.1.3.2. Flow Cytometry
    - 2.7.1.3.3. Cytogenetics
    - 2.7.1.3.4. Molecular Biology
  - 2.7.1.4. Diagnosis Classification
- 2.7.2. Acute Lymphoid Leukemia
  - 2.7.2.1. Laboratory Findings and Complementary Examinations
  - 2.7.2.2. Hemogram and Peripheral Blood Smear
  - 2.7.2.3. Bone Marrow Study
    - 2.7.1.3.1. Bone Marrow Morphology
    - 2.7.1.3.2. Flow Cytometry
    - 2.7.1.3.3. Cytogenetics
    - 2.7.1.3.4. Molecular Biology
  - 2.7.2.4. Diagnosis Classification

2.8. Mature B- and T-Lymphoid Neoplasms
- 2.8.1. Chronic Lymphoproliferative Syndromes B. Chronic Lymphocytic Leukemia
  - 2.8.1.1. Laboratory Studies and Differential Diagnosis
    - 2.8.1.1.1. Chronic Lymphocytic Leukemia
    - 2.8.1.1.2. Tricholeukemia
    - 2.8.1.1.3. Splenic Marginal Zone Lymphoma
    - 2.8.1.1.4. Prolymphocytic Leukemia
    - 2.8.1.1.5. Granular Lymphocyte Leukemia

2.8.2. Non-Hodgkin's Lymphomas
2.8.2.1. Initial Study and Diagnosis
2.8.2.2. Classification of Lymphoid Neoplasms
2.8.2.2.1. Follicular Lymphoma
2.8.2.2.2. Mantle Cell Lymphoma
2.8.2.2.3. Diffuse Large B-Cell Lymphoma.
2.8.2.2.4. MALT Lymphoma
2.8.2.2.5. Burkitt's Lymphoma
2.8.2.2.6. Peripheral T Lymphomas
2.8.2.2.7. Cutaneous Lymphomas
2.8.2.2.8. Others
2.8.3. Hodgkin's Lymphomas
2.8.3.1. Complementary Tests
2.8.3.2. Histological Classification
2.9. Diagnosis of Coagulation Disorders
2.9.1. Study of Hemorrhagic Diatheses
2.9.1.1. Initial Tests
2.9.1.2. Specific Studies
2.9.2. Congenital Coagulation Alterations
2.9.2.1. Hemophilia A and B
2.9.2.2. Von Willebrand Disease
2.9.2.3. Other Congenital Coagulopathies
2.9.3. Acquired Coagulation Alterations
2.9.4. Thrombosis and Thrombophilia Antiphospholipid Syndrome
2.9.5. Monitoring of Antocoagulant Therapy
2.10. Introduction to Hemotherapy
2.10.1. Blood Groups
2.10.2. Blood Components
2.10.3. Recommendations for the Use of Blood Derivatives
2.10.4. Most Common Transfusional Reactions

Module 3. Immunology

3.1. Immune System Organs
3.1.1. Primary Lymphoid Organs
3.1.1.1. Fetal Liver
3.1.1.2. Bone Marrow
3.1.1.3. Thymus
3.1.2. Secondary Lymphoid Organs
3.1.2.1. Bladder
3.1.2.2. Lymph Nodes
3.1.2.3. Mucosal-Associated Lymphoid Tissue
3.1.3. Tertiary Lymphoid Organs
3.1.4. Lymphatic system
3.2. Immune System Cells
3.2.1. Granulocytes
3.2.1.1. Neutrophils
3.2.1.2. Eosinophils
3.2.1.3. Basophils
3.2.2. Monocytes and Macrophages
3.2.3. Lymphocytes
3.2.3.1. T Lymphocytes
3.2.3.2. B Lymphocytes
3.2.4. Natural Killer Cells
3.2.5. Antigen Presenting Cells
3.3. Antigens and Immunoglobulins
3.3.1. Antigenicity and Immunogenicity
3.3.1.1. Antigen
3.3.1.2. Immunogen
3.3.1.3. Epitopes
3.3.1.4. Haptenos and Carriers
3.3.2. Immunoglobulins
3.3.2.1. Structure and Function
3.3.2.2. Classification of Immunoglobulins
3.3.2.3. Somatic Hypermutation and Isotype Shift

3.4. Complement System
- 3.4.1. Functions
- 3.4.2. Activation Routes
  - 3.4.2.1. Classical Pathway
  - 3.4.2.2. Alternative Pathway
  - 3.4.2.3. Lectin Pathway
- 3.4.3. Complement Receptors
- 3.4.4. Complements and Inflammation
- 3.4.5. Complement Cascade

3.5. Major Histocompatibility Complex
- 3.5.1. Major and Minor Histocompatibility Antigens
- 3.5.2. HLA Genetics
- 3.5.3. HLA and Disease
- 3.5.4. Transplant Immunology

3.6. Immune Response
- 3.6.1. Innate and Adaptive Immune Response
- 3.6.2. Humoral Immune Response
  - 3.6.2.1. Primary Response
  - 3.6.2.2. Secondary Response
- 3.6.3. Cellular Immune Response

3.7. Autoimmune Diseases
- 3.7.1. Immunogenic Tolerance
- 3.7.2. Autoimmunity
- 3.7.3. Autoimmune Diseases
- 3.7.4. Study of Autoimmune Diseases

3.8. Immunodeficiencies
- 3.8.1. Primary Immunodeficiencies
- 3.8.2. Secondary Immunodeficiencies
- 3.8.3. Antitumor Immunity
- 3.8.4. Evaluation of Immunity

3.9. Hypersensitivity Reactions
- 3.9.1. Classification of Hypersensitivity Reactions
- 3.9.2. Type I Hypersensitivity or Allergic Reactions
- 3.9.3. Anaphylaxis
- 3.9.4. Allergological Diagnostic Methods

3.10. Immunoanalytical Techniques
- 3.10.1. Precipitation and Agglutination Techniques
- 3.10.2. Complement Fixation Techniques
- 3.10.3. ELISA Techniques
- 3.10.4. Immunochromatography Techniques
- 3.10.5. Radioimmunoanalysis Techniques
- 3.10.6. Isolation of Lymphocytes
- 3.10.7. Microlymphocytotoxicity Technique
- 3.10.8. Mixed Lymphocyte Culture
- 3.10.9. Flow Cytometry Applied to Immunology
- 3.10.10. Flow Cytometry

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***.

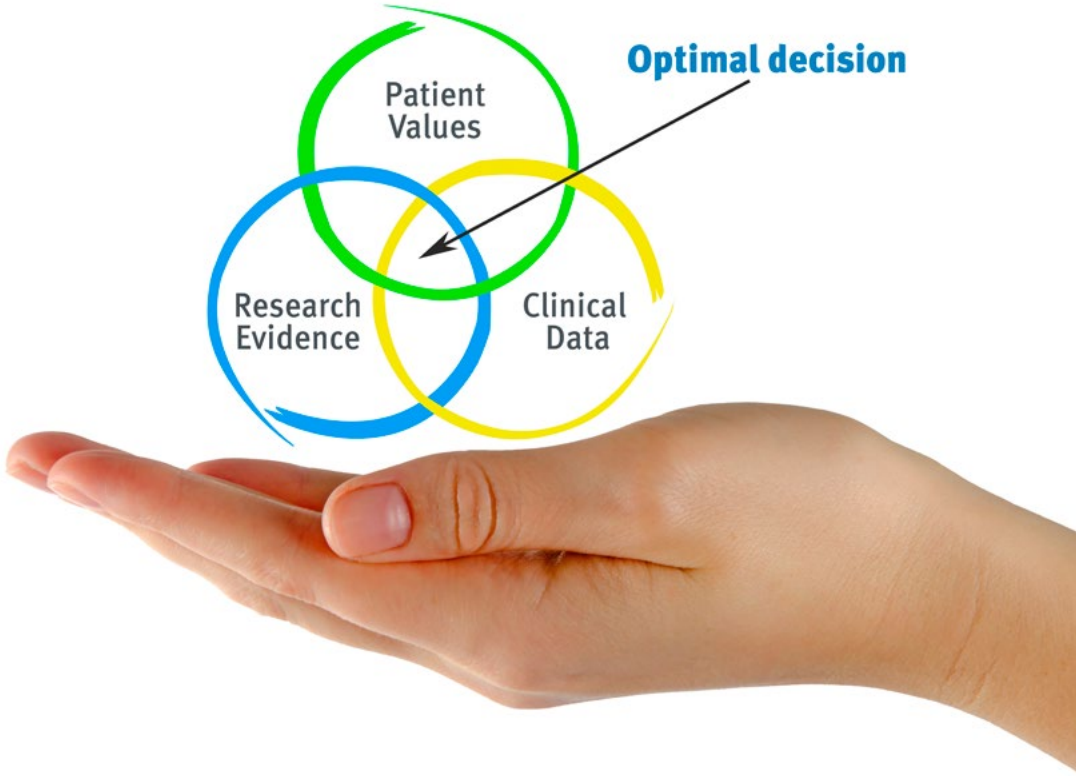
This teaching system is used in the most prestigious medical schools in the world, and major publications such as the ***New England Journal of Medicine*** have considered it to be one of the most effective.

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. 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 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:

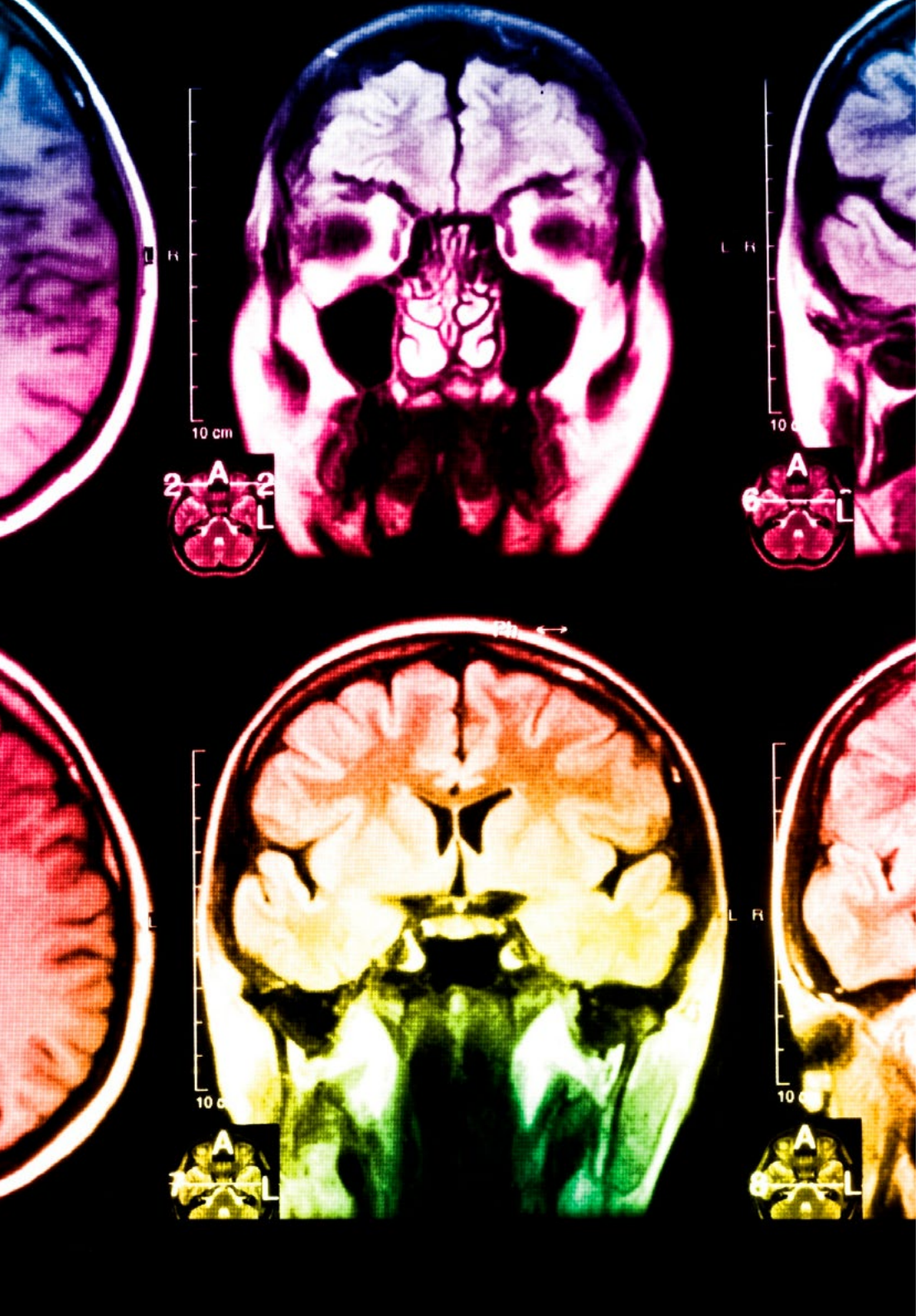
1. Students who follow this method not only grasp concepts, but also develop their mental capacity by evaluating real situations and applying their knowledge.
2. The learning process has a clear focus on practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts 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.

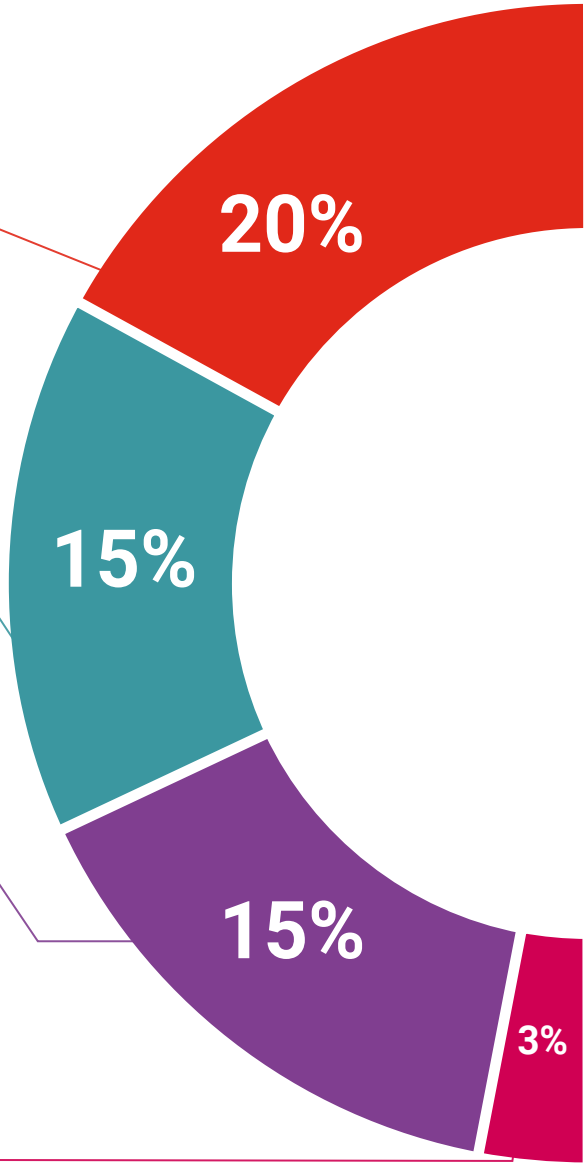
Interactive Summaries

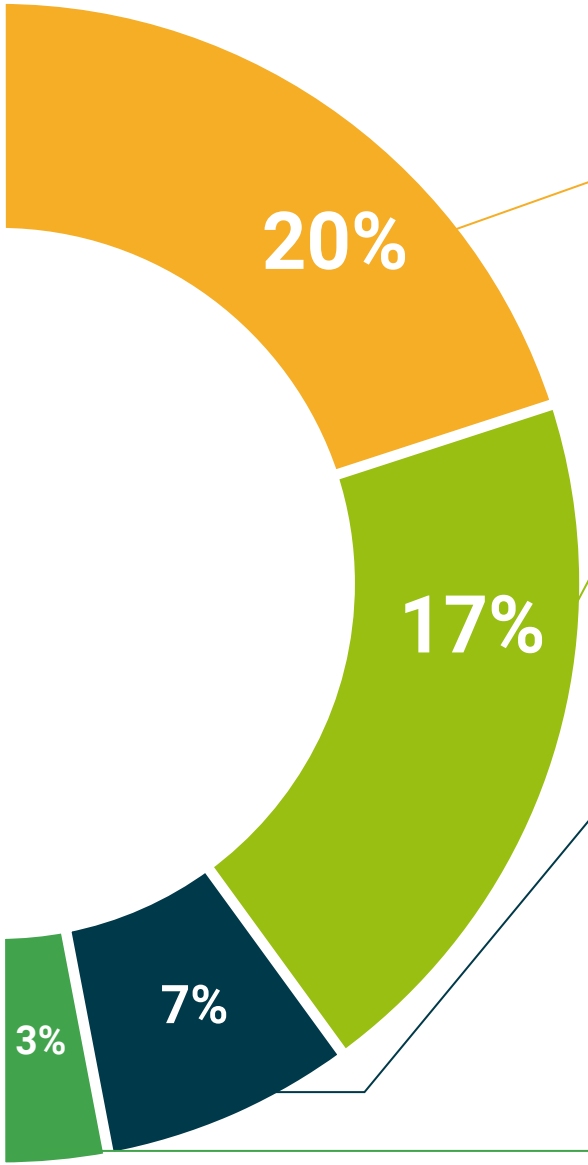
We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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 Biomedicine in the Field of Clinical Analysis: a highly qualified added value for any medical professional"

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

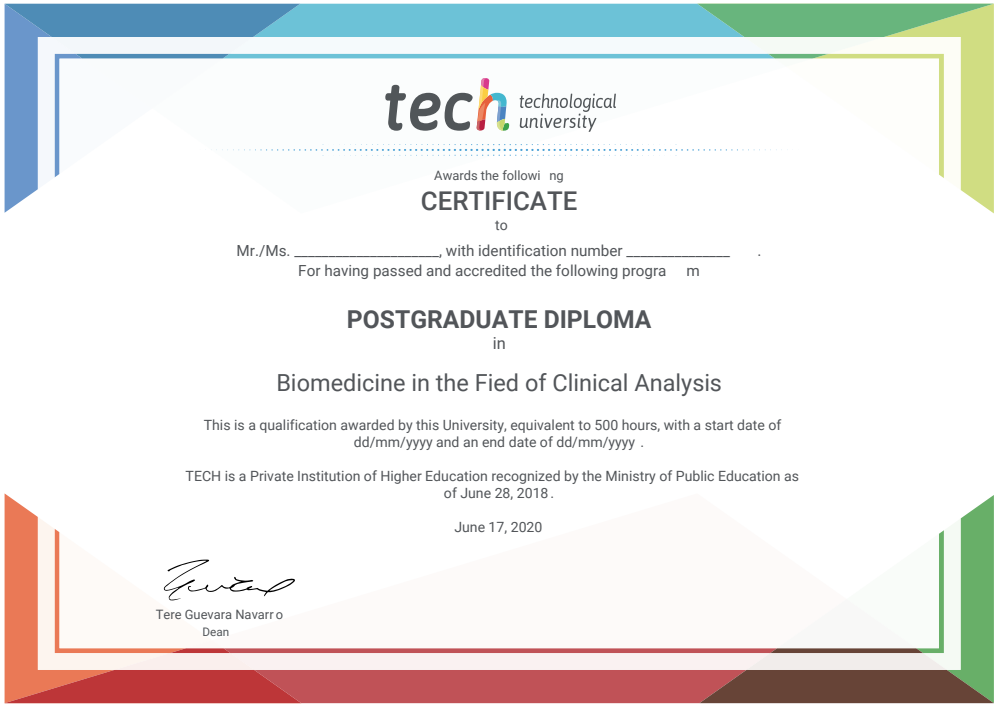
After the student has passed the assessments, they will receive their corresponding **Postgraduate Diploma** issued by **TECH Technological University** via tracked delivery.

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 Biomedicine in the Field of Clinical Analysis**

ECTS: **18**

Official Number of Hours: **450**


tech technological university

Awards the followi ng

CERTIFICATE

to

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

For having passed and accredited the following progra m

POSTGRADUATE DIPLOMA

in

Biomedicine in the Fied of Clinical Analysis

This is a qualification awarded by this University, equivalent to 500 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 Navarr o

Dean

*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.

health

people

teaching

community

innovation

knowledge

languages

tech technological university

Postgraduate Diploma

Biomedicine 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

Biomedicine in the Field of Clinical Analysis

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