Postgraduate Certificate

Instrumental Techniques in the Clinical Analysis Laboratory

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Postgraduate Certificate

Instrumental Techniques in the Clinical Analysis Laboratory

Course Modality: **Online**

Duration: **2 months.**

Certificate: **TECH Technological University**

Teaching Hours: **150 hours.**

Website: www.techtitute.com/us/medicine/postgraduate-certificate/instrumental-techniques-clinical-analysis-laboratory

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01

Introduction

In this complete Postgraduate Certificate, we offer you the possibility of updating your knowledge in clinical analysis laboratory work and, specifically, in the instrumental techniques that are performed in it. 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.

A complete Postgraduate Certificate that will teach you the instrumental techniques that make up the clinical analysis laboratory"

The clinical professional will achieve, with the study of this Postgraduate Certificate, excellence in the knowledge of instrumental techniques and sample collection techniques, as the basis of analytical methodology, 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.

The skills that the student must acquire in order to be qualified as an expert in Clinical Analysis and develop their work in a laboratory of this kind are:

- Select, recommend, take samples and perform the most appropriate laboratory procedures to study the patient's situation, ensuring the collection of quality-assured and cost-optimal results.
- Interpret the results obtained in relation to the clinical situation of the patient, by passing this information on to the clinicians.
- Gain specialized knowledge focused on the clinical usefulness of laboratory procedures, evaluating and maintaining the quality of available methods and designing and implementing new analytical methods.

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 Instrumental Techniques in the Clinical Analysis Laboratory** offers you the advantages 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
- Complementary documentation banks permanently available, even after the Postgraduate Certificate

A highly qualified Postgraduate Certificate that will allow you to become one of the best specialized professionals in the 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 deliver the educational 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 Instrumental Techniques in the Clinical Analysis Laboratory. 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 based on Problem-Based Learning: an approach that conceives learning as an eminently 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.

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

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"

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.

A Postgraduate Certificate focused on achieving the necessary skills in order to carry out the instrumental techniques of a laboratory with the solvency of an expert"

General Objectives

- 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 comprehension of instrumental techniques
- Establish the direct applications of instrumental techniques of clinical analysis in human health as a diagnostic and preventive element.
- Analyze the necessary process prior to the use of instrumental techniques that should 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.

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.

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 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

Dr. Calle Guisado, Violeta

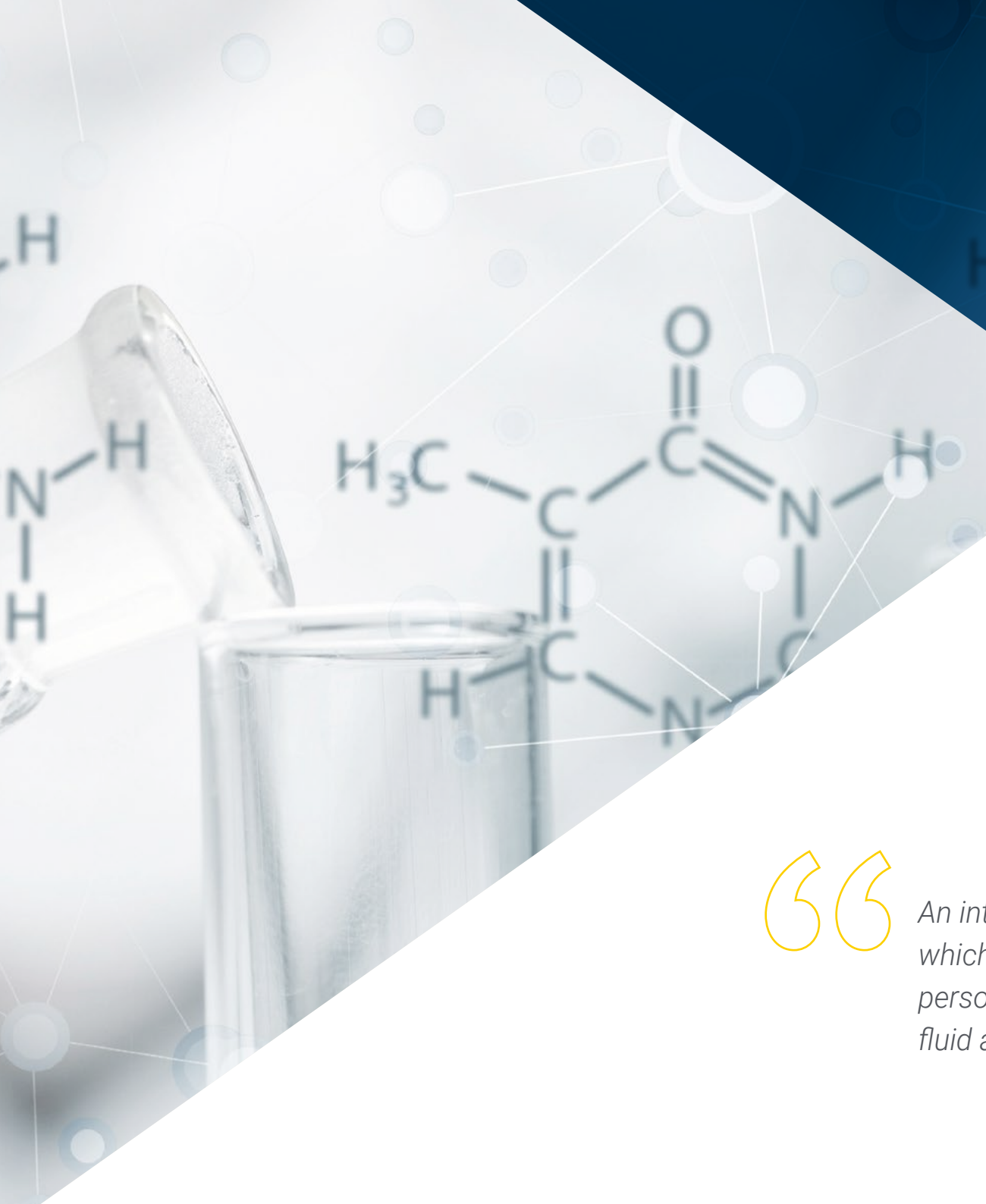
- PhD in Public and Animal Health from the University of Extremadura. Cum Laude Mention and International PhD obtained in July 2019 and Outstanding Award in her PhD in 2020.
- Degree in Biology from the University of Extremadura (2012).

04

Structure and Content

The contents of this Postgraduate Certificate have been developed by the different professors 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.



An interesting syllabus from start to finish which will take you through the process of personal and professional growth in a more fluid and comfortable way"

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 Techniques 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

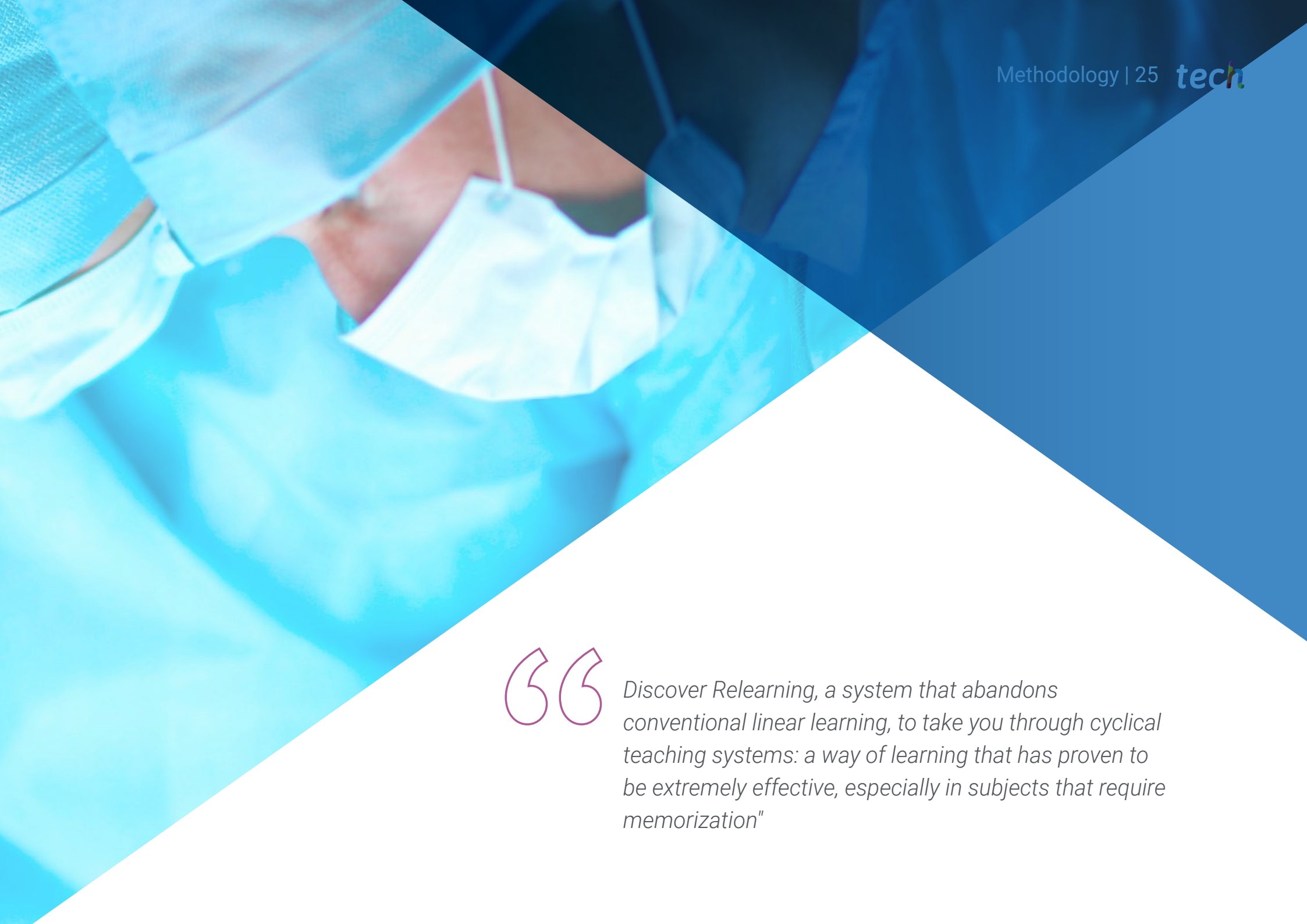
A unique, key, and decisive master's degree experience to boost your professional development"

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.

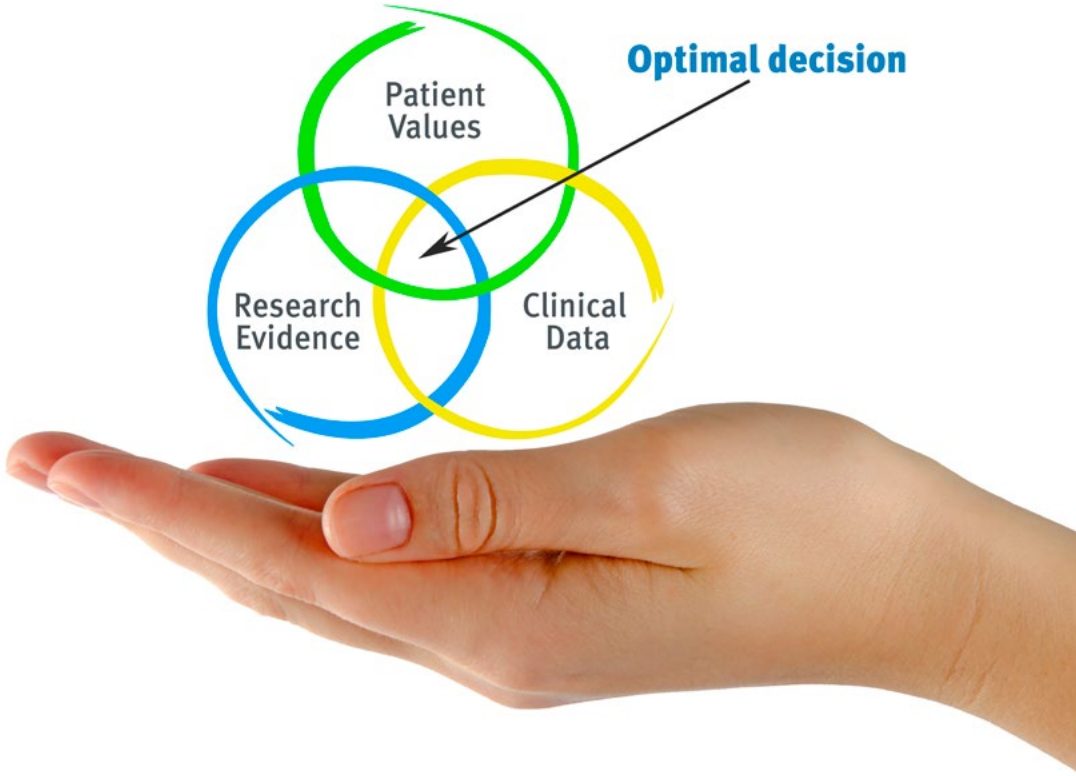


Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

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.

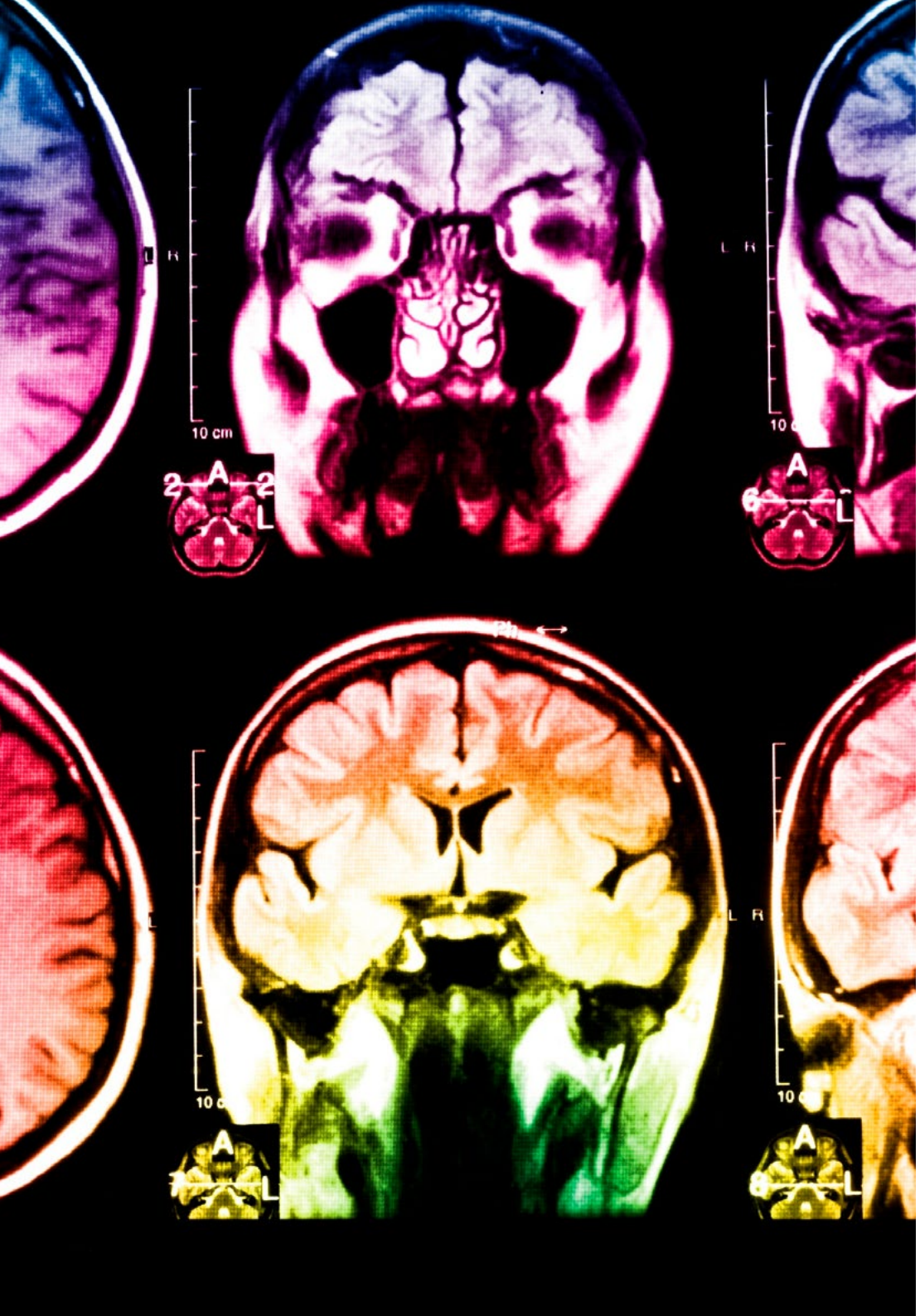
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.

Relearning Methodology

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

This university is the first in the world to combine the study of clinical cases with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, a real revolution with respect to the mere study and analysis of cases.

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



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.

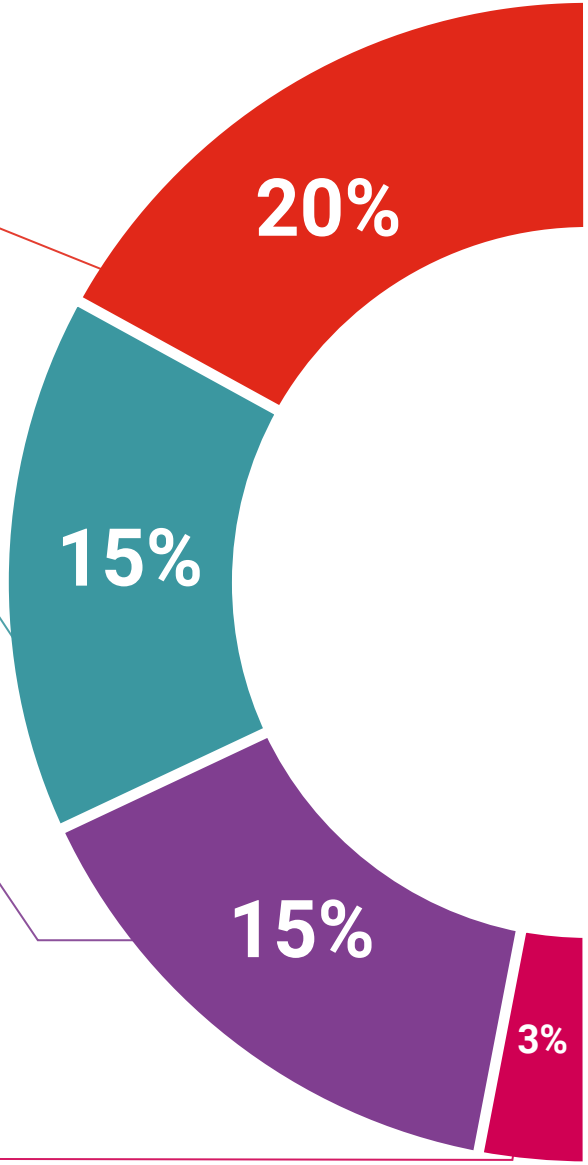
Interactive Summaries

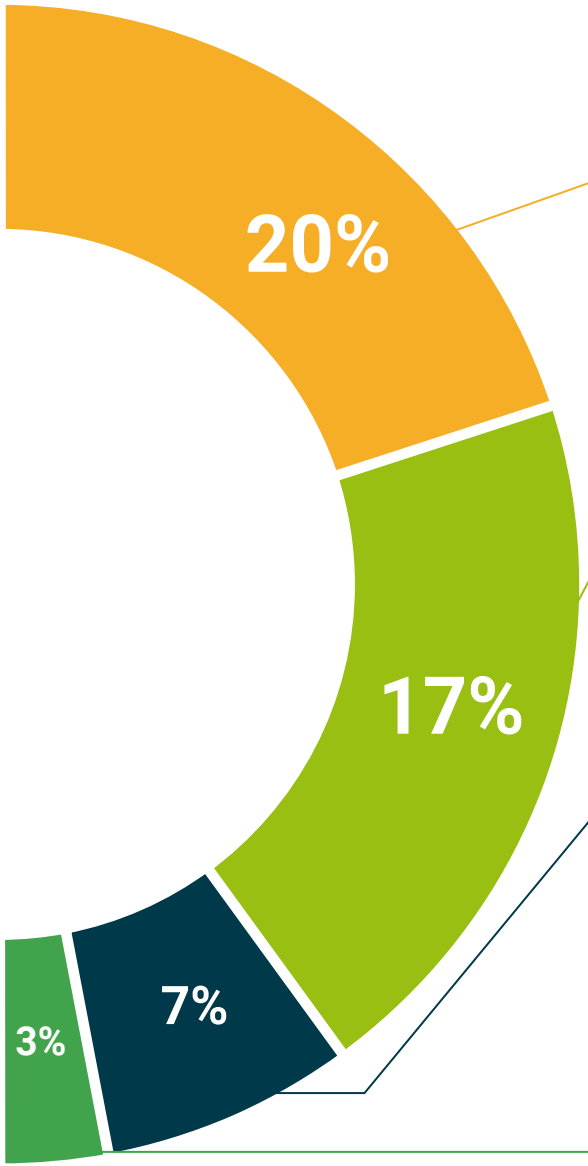
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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 Instrumental Techniques in the Clinical Analysis Laboratory: a highly qualified added value for any professional in this area"

This **Postgraduate Diploma in Instrumental Techniques in the Clinical Analysis Laboratory** 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 diploma 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 Instrumental Techniques in the Clinical Analysis Laboratory**

Official Nº of Hours: **150 hours.**


tech technological university

Awards the followi ng

DIPLOMA

to

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

For having passed and accredited the following progra m

POSTGRADUATE CERTIFICATE

in

Instrumental Techniques in the Clinical Analysis Laboratory

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

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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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