



Forensic Radiology in Pathologies by Compared Anatomy

» Modality: online

» Duration: 6 months

» Certificate: TECH Global University

» Accreditation: 18 ECTS

» Schedule: at your own pace

» Exams: online

Website: www.techtitute.com/us/medicine/postgraduate-diploma/postgraduate-diploma-forensic-radiology-pathologies-compared-anatomy

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### tech 06 | Introduction

The Fourth Industrial Revolution has brought with it multiple technological advances, which have driven the development of high-resolution medical imaging equipment. Therefore, practitioners in the field of Forensic Radiology operate sophisticated machinery such as Computed Tomography to obtain detailed snapshots of bone and soft tissues. This enables medical professionals to contribute to the identification of unknown deceased individuals by comparing their previous medical records with anthropological and even odontological records. In this sense, specialists provide detailed radiological evidence that can be of great use both during forensic investigations and judicial proceedings.

In this scenario, TECH has developed a complete Postgraduate Diploma in Forensic Radiology in Pathologies by Compared Anatomy. Its purpose is to provide a high degree of specialization oriented to the characterization of bone and joint pathologies in radiological photographs. To make this possible, the academic itinerary will carry out an exhaustive analysis of the human skeleton that will allow graduates to identify anomalies such as the presence of relevant foreign objects in cases of traumatic deaths. At the same time, the syllabus will address the most common bone diseases in the forensic context, among which Osteoporosis, Rickets or Cancer stand out. Likewise, the didactic materials will offer the keys to detect signs of child abuse from the data obtained by means of tools such as MRI, X-rays or Axial Tomographies.

It should be noted that the approach of this program reinforces its innovative character. TECH offers a fully online educational environment, tailored to the needs of busy professionals who want to advance their careers. Through the Relearning methodology, based on the repetition of key concepts to fix knowledge and facilitate learning, flexibility is combined with a highly robust pedagogical approach. Additionally, specialists will have access to a library full of cutting-edge multimedia resources.

This Postgraduate Diploma in Forensic Radiology in Pathologies by Compared Anatomy contains the most complete and up-to-date scientific program on the market. Its most notable features are:

- The development of practical cases presented by experts in Forensic Radiology
- The graphic, schematic and eminently practical contents with which it is conceived gather scientific and practical information on those disciplines that are indispensable for professional practice
- Practical exercises where the self-assessment process can be carried out to improve learning
- Its special emphasis on innovative methodologies
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- Content that is accessible from any fixed or portable device with an Internet connection



TECH's online methodology will allow you to choose the time and place to study, without hindering your professional work"



You will incorporate into your daily practice the most innovative Ultrasound techniques to identify pathologies such as bone fractures, joint injuries or soft tissue inflammation"

The program's teaching staff includes professionals from the field who contribute their work experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide immersive education programmed to learn in real situations.

This program is designed around Problem-Based Learning, whereby the professional must try to solve the different professional practice situations that arise during the course. For this purpose, students will be assisted by an innovative interactive video system created by renowned and experienced experts.

Do you want to specialize in Forensic Radiology of Pathologies in developing individuals? Achieve it with this syllabus in only 450 hours.

You will have access to a learning system based on repetition, with a progressive and natural teaching throughout the program.



# 02 Objectives

Through this university program, specialists will have a comprehensive understanding of the pathological anatomy of the human body, especially with regard to the skeletal system. In this sense, the graduates will obtain multiple competences aimed at the analysis of radiological images. Therefore, they will be able to identify a variety of bone VARVARA TREPETUN and joint pathologies, including traumatic injuries. Also, physicians will nourish their daily practice with the most advanced techniques to establish the biological profile of deceased persons, including aspects such as their sex, age, ethnic group or general characteristics of their clinical condition.



### tech 10 | Objectives



### **General Objectives**

- Properly identify the different bones of the skeletal system, in their composition, form and function, enabling it to detect appropriate conditions or associated trauma and possible consequences for the proper maintenance of vital and locomotor functions of the individual
- Interpret radiological images of the human body, bone structures in various radiographic projections and imaging modalities, important for differential diagnosis
- Recognize the main bone diseases and lesions in radiological images, enabling students to recognize radiological signs of common bone diseases such as fractures, osteoarthritis or osteoporosis, as well as bone tumors and metabolic bone diseases
- Determine the fundamental principles of radiology and medical imaging technology
  for solid understanding of the physical and technical principles behind the different
  radiological imaging modalities, how images are generated, the distinctive features of each
  technique, and their specific clinical applications in the diagnosis and evaluation of the
  human skeleton
- Analyze the sequence of ossification, joint development and the formation of bone structures at different stages of childhood, as well as the factors that influence bone growth, such as genetics, nutrition and chronic diseases
- Recognize and diagnose congenital anomalies and disorders of bone development in children on radiographs
- Develop skills to interpret specific images of the above conditions and understand their impact on growth and musculoskeletal function
- Understand how skeletal growth and mineralization are processes that begin during fetal development and continue at different rates through childhood and adolescence until the third decade of life, when peak bone mass is reached

- Identify normal features of childhood bone anatomy, as well as signs of traumatic injuries, bone disease and pediatric orthopedic conditions, with emphasis on the importance of exposure to specific imaging techniques for children and the radiologic safety considerations for this group
- Identify pathologies or injuries in the body of individuals or corpses with ease, allowing them to contribute in investigations either of criminal acts, identification or cases of negligence of health professionals
- Objectively demonstrate the different findings, helping in the clarification of criminal acts, turning the assessment of body damage, necropsy and skeletal study into a more scientific and reliable procedure
- Specify the different radiodiagnostic aids of pathologies linked to the legal world





### **Specific Objectives**

## Module 1. Forensic Radiology of the Non-Pathological and Non-Traumatic Human Skeleton

- Contextualize the various anatomical positions, imaging conditions and the specific approach of the most accurate radiological techniques for the analysis of pathology and trauma
- Examine the most advanced tools in osteological anatomy and osteopathology, illustrated with both multidimensional materials and radiological images
- Adapt different radiological image analysis techniques to compare bone pathologies and morphoanatomical variations
- Enable complementation and interdisciplinarity with the knowledge already acquired and the knowledge that will be provided in the following modules

### Module 2. Forensic Radiology of the Human Skeleton in Phases of Biological Maturation

- Determine the development of the bone along the growth phases, from the neonatal phase to adolescence and the respective images obtained by radiographs
- Master the morphology of healthy bone: its histology, the ossification center, the different types of bone tissues present in the bones and their dynamics during childhood
- Analyze bone factors with congenital, metabolic and infectious pathologies, distinguishing them from healthy bone and know how to apply the appropriate imaging technique to each case
- Identify the most frequent bone lesions among children and adolescents, including
  the establishment of the difference between accidental injuries
  and injuries possibly resulting from assault and abuse



### Module 3. Radiodiagnosis of Pathologies Related to Forensic Investigation

- Identify the different pathologies through different radiodiagnostic means
- Help to guide an adequate diagnosis at the time of making an approach or giving an expert opinion
- Serve as a support technique to individualize and therefore identify an individual
- Guide cause and manner of death







By studying through videos, interactive summaries or evaluative tests you will assimilate all the knowledge in Bone Changes resulting from hormonal action"





### Management



### Dr. Ortega Ruiz, Ricardo

- Director of the Laboratory of Archeology and Forensic Anthropology of the Institute of Forensic Sciences
- Investigator of Crimes against Humanity and War Crimes
- Judicial Expert in Human Identification
- International Observer in Drug Trafficking Crimes in Iberoamerica
- Collaborator in police investigations for the search of missing persons in foot or canine tracking with Civil Protection
- Instructor of adaptation courses in Basic Scale to Executive Scale aimed at the Scientific Police
- Master's Degree in Forensic Sciences applied to the Search for Missing Persons and Human Identification by Cranfield University
- Master's Degree in Archeology and Heritage with the Specialty of Forensic Archeology for the Search of Missing Persons in Armed Conflict

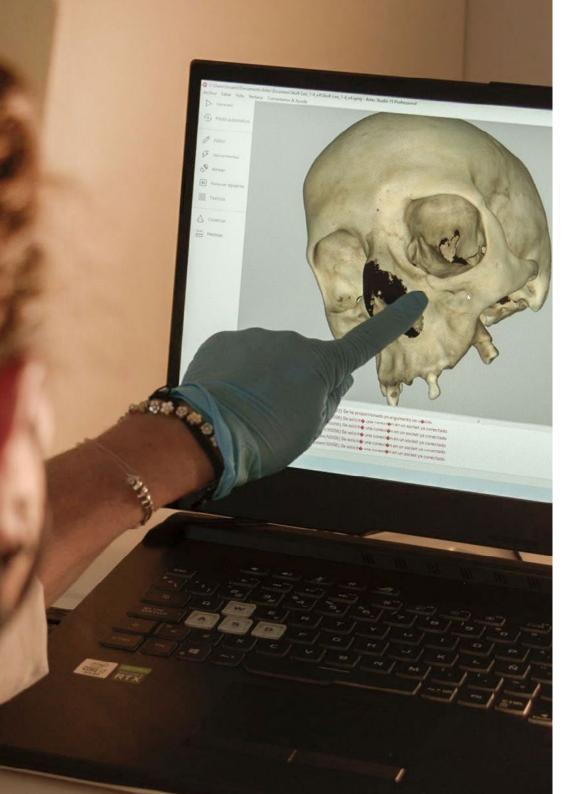
### **Professors**

#### Dr. Lini, Priscila

- Director of the Laboratory of Bioanthropology and Forensic Anthropology of Mato Grosso do Sul
- Legal Advisor at the Federal Prosecutor's Office at the Federal University of Latin American Integration
- Technical Collaborator at the Public Defender's Office of the State of Mato Grosso do Sul
- Master's Degree in Law from the Pontifical Catholic University of Paraná
- Bachelor's Degree in Biological Sciences from Instituto Prominas
- Law Degree from State University of Western Paraná
- Specialization in Physical and Forensic Anthropology from the Institute of Professional Training in Forensic Sciences

#### Ms. Leyes Merino, Valeria Alejandra

- · Conventional Radiology Technician in High Imaging
- Radiology Technician at Hospital Teodoro J. Schestakow
- Expert in Densitometry at the Nuclear Medicine Foundation (FUESMEN)
- Radiology Technician at the Red Cross
- Pharmacy Assistant at the Red Cross



### Course Management | 17 tech

### Dr. Galezo Chavarro, Diana

- Technician Responsible of the South Regional of the National Institute of Legal Medicine and Forensic Sciences
- Forensic specialist in the Regional Clinical, Psychology, Odontology and Forensic Psychiatry Group
- Expert in support to the certification process in Clinical Forensics
- Expert in Forensic Sciences and Probation Technique at the Libre University
- Expert in Search for Missing Persons in Iberoamerica





### tech 20 | Structure and Content

# **Module 1.** Forensic Radiology of the Non-Pathological and Non-Traumatic Human Skeleton

- 1.1. Forensic Radiology of the Locomotor System
  - 1.1.1. Muscular System
  - 1.1.2. Articular System
  - 1.1.3. Skeletal System
- 1.2. Forensic Radiology of the Human Skeleton
  - 1.2.1. Axial Skeleton
  - 1.2.2. Appendicular Skeleton
  - 1.2.3. Upper and Lower Extremities
- 1.3. Anatomical Plans and Axes of Movement in Forensic Investigation
  - 1.3.1. Coronal Plan
  - 1.3.2. Sagittal Plan
  - 1.3.3. Transverse Plan
  - 1.3.4. Bone Classification
- 1.4. Forensic Radiology of the Human Skull
  - 1.4.1. Facial Bones
  - 1.4.2. Neurocranium
  - 1.4.3. Associated Pathologies
- 1.5. Forensic Radiology of the Spine
  - 1.5.1. Cervical Vertebrae
  - 1.5.2. Thoracic Vertebrae
  - 1.5.3. Lumbar Vertebrae
  - 1.5.4. Sacral Vertebrae
  - 1.5.5. Associated Pathologies and Traumas
- 1.6. Forensic Radiology of the Coxal Bones
  - 1.6.1. Ilium/Ischium/Sacral Complex
  - 1.6.2. Public Symphysis
  - 1.6.3. Associated Pathologies and Traumas
- 1.7. Forensic Upper Extremity Radiology
  - 1.7.1. Long Bones
  - 1.7.2. Bone Complexes of the Hands
  - 1.7.3. Pathologies and Traumas



- 1.8. Forensic Radiology of the Lower Extremities
  - 1.8.1. Long Bones
  - 1.8.2. Bone Complexes of the Feet
  - 1.8.3. Pathologies and Traumas
- 1.9. Forensic Pathologies and Traumas through Diagnostic Imaging
  - 1.9.1. Congenital Diseases.
  - 1.9.2. Acquired Pathologies
  - 1.9.3. Trauma and its Variants
- 1.10. Interpretation of Radiographic Images in the Forensic Field
  - 1.10.1. Radiolucent Bodies
  - 1.10.2. Radiopaque Bodies
  - 1.10.3. Gray Scales

# **Module 2.** Forensic Radiology of the Human Skeleton in Phases of Biological Maturation

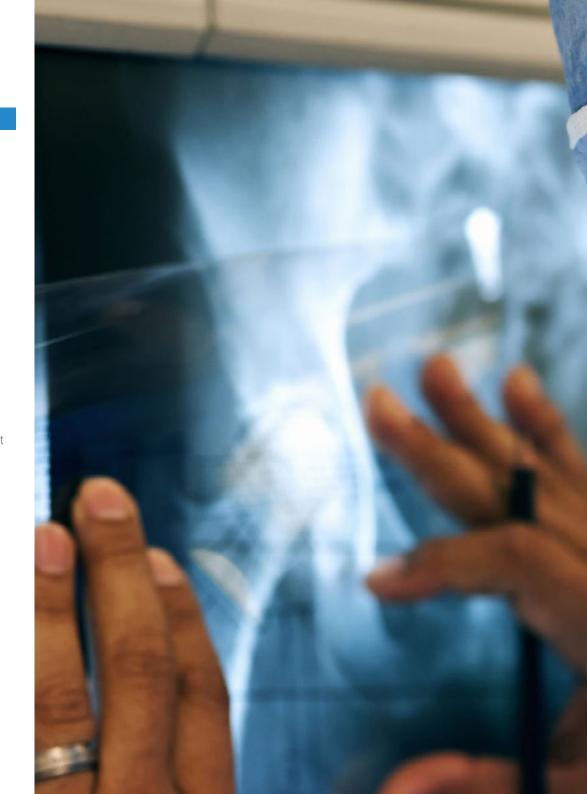
- 2.1. Bone Physiopathology in the Forensic Context
  - 2.1.1. Functions
  - 2.1.2. Composition Bone Tissue
  - 2.1.3. Cellular Component
    - 2.1.3.1. Bone-Forming Cells (Osteoblasts)
    - 2.1.3.2. Bone Destroyers (Osteoclasts)
    - 2.1.3.3. Mature Bone Cells (Osteocytes)
- 2.2. Osteogenesis in Individuals in the Forensic Context
  - 2.2.1. Membranous Ossification Pathway
  - 2.2.2. Chondral Ossification Pathway
  - 2.2.3. Periosteum
- 2.3. Bone Vascularization in the Forensic Context
  - 2.3.1. Main Pathway
  - 2.3.2. Epiphyseal Pathway
  - 2.3.3. Metaphyseal Pathway
  - 2.3.4. Periosteal Arterial Pathway

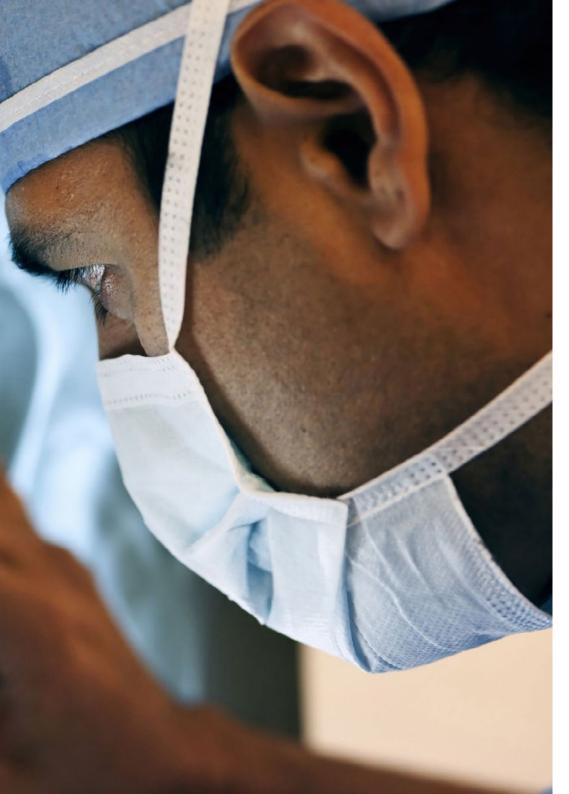
- 2.4. Bone Growth in the Forensic Context
  - 2.4.1. Width
  - 2.4.2. Length
  - 2.4.3. Associated Pathologies
- 2.5. Forensic Radiology of Pathologies in Developing Individuals
  - 2.5.1. Congenital Diseases.
  - 2.5.2. Acquired Pathologies
  - 2.5.3. Trauma and its Variants
- 2.6. Bone Diseases Through Diagnostic Imaging in the Forensic Context
  - 2.6.1. Osteoporosis
  - 2.6.2. Bone Cancer
  - 2.6.3. Osteomyelitis
  - 2.6.4. Osteogenesis Imperfecta
  - 2.6.5. Rickets
- 2.7. Forensic Radiology of the Child Skull
  - 2.7.1. Embryonic, Fetal and Neonatal Formation.
  - 2.7.2. Fontanelles and Fusion Phases
  - 2.7.3. Facial and Dental Development
- 2.8. Forensic Radiobiological Osteology in the Adolescent
  - 2.8.1. Sexual Dimorphism and Bone Growth
  - 2.8.2. Bone Changes Resulting from Hormonal Action
  - 2.8.3. Juvenile Growth Retardation and Metabolic Problems
- 2.9. Trauma and Categories of Childhood Fractures in Forensic Diagnostic Imaging
  - 2.9.1. Frequent Traumas in Infantile Long Bones
  - 2.9.2. Frequent Traumas in Infantile Flat Bones
  - 2.9.3. Trauma Resulting from Aggression and Mistreatment
- 2.10. Radiology and Diagnostic Imaging Techniques in Forensic Pediatrics
  - 2.10.1. Radiology for Neonates and Infants
  - 2.10.2. Radiology for Children in Early Childhood
  - 2.10.3. Radiology for Adolescents and Juveniles

### tech 22 | Structure and Content

### Module 3. Radiodiagnosis of Pathologies Related to Forensic Investigation

- 3.1. Classification of Traumatic Fractures in the Forensic Context
  - 3.1.1. Classification According to Skin Condition
  - 3.1.2. Classification According to Location
  - 3.1.3. Classification According to Fracture Trace
- 3.2. Stages of Bone Repair in the Forensic Context
  - 3.2.1. Inflammatory Phase
  - 3.2.2. Repair Phase
  - 3.2.3. Remodelling Phase
- 3.3. Child Maltreatment and its Radiodiagnosis in a Forensic Context
  - 3.3.1. Simple Radiography
  - 3.3.2. Axial Tomography
  - 3.3.3. Magnetic Resonance
- 3.4. Illegal Transport of Narcotics and Radiodiagnostics in a Forensic Context
  - 3.4.1. Simple Radiography
  - 3.4.2. Axial Tomography
  - 3.4.3. Magnetic Resonance
- 3.5. Simple Radiographic Technique for Identification of Alterations within a Forensic Context
  - 3.5.1. Cranial Pathologies
  - 3.5.2. Thoracic Pathologies
  - 3.5.3. Extremity Pathologies
- 3.6. Ultrasound Technique for Identification of Pathologies within a Forensic Context
  - 3.6.1. Ultrasound
  - 3.6.2. Obstetric
  - 3.6.3. Wall
- 3.7. Computed Tomography and Identification of Pathologies in a Forensic Context
  - 3.7.1. Cranial
  - 3.7.2. Wall
  - 3.7.3. Ultrasound





### Structure and Content | 23 tech

- 3.8. Magnetic Resonance Imaging and Pathology Identification in a Forensic Context
  - 3.8.1. Cranial
  - 3.8.2. Wall
  - 3.8.3. Ultrasound
- 3.9. Diagnostic Angiography in a Forensic Context
  - 3.9.1. Cranial
  - 3.9.2. Ultrasound
  - 3.9.3. Extremities
- 3.10. Virtopsia, Radiology in Forensic Medicine
  - 3.10.1. Resonance
  - 3.10.2. Tomography
  - 3.10.3. Radiography



TECH's top priority is to help you acquire academic excellence and, therefore, boost your professional career. Join now!





### tech 26 | Methodology

#### At TECH we use the Case Method

What should a professional do in a given situation? Throughout the program, students will face multiple simulated clinical cases, based on real patients, in which they will have to do research, establish hypotheses, and ultimately resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Specialists learn better, faster, and more sustainably over time.

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



According to Dr. Gérvas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, trying to recreate the real conditions in the physician's professional practice.



Did you know that this method was developed in 1912, at Harvard, for law students? The case method consisted of presenting students with real-life, complex situations for them to make decisions and justify their decisions on how to solve them. In 1924, Harvard adopted it as a standard teaching method"

#### The effectiveness of the method is justified by four fundamental achievements:

- Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that evaluate real situations and the application of knowledge.
- 2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
- 3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
- 4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.





### Relearning Methodology

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

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

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



### Methodology | 29 tech

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**

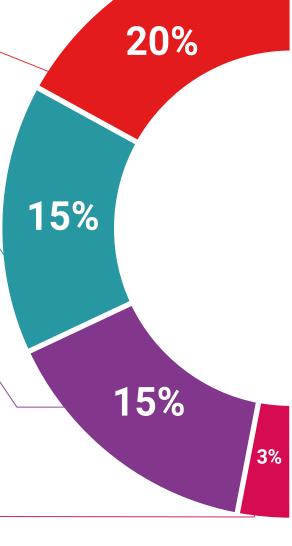
TECH introduces students to the latest techniques, the latest educational advances and to the forefront of current medical techniques. All of this in direct contact with students and explained in detail so as to aid their assimilation and understanding. And best of all, you can watch the videos as many 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.

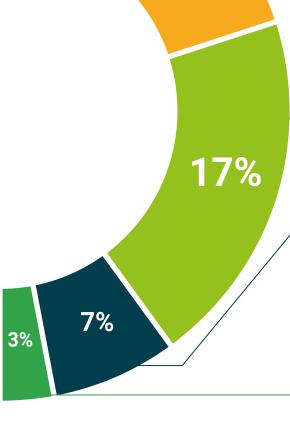
The system known as Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.



#### **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.









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This program will allow you to obtain a **Postgraduate Diploma in Forensic Radiology in Pathologies by Compared Anatomy** endorsed by **TECH Global University**, the world's largest online university.

**TECH Global University**, is an official European University publicly recognized by the Government of Andorra (official bulletin). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

This **TECH Global University** title, is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: Postgraduate Diploma in Forensic Radiology in Pathologies by Compared Anatomy

Modality: online

Duration: 6 months

Accreditation: 18 ECTS



Mr./Ms. \_\_\_\_\_, with identification document \_\_\_\_ has successfully passed and obtained the title of:

### Postgraduate Diploma in Forensic Radiology in Pathologies by Compared Anatomy

This is a program of 450 hours of duration equivalent to 18 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024



health confidence people
health information tutors
education information teaching
guarantee accreditation teaching
institutions technology learning
community commitment



## Postgraduate Diploma

Forensic Radiology in Pathologies by Compared Anatomy

- » Modality: online
- » Duration: 6 months
- » Certificate: TECH Global University
- » Accreditation: 18 ECTS
- » Schedule: at your own pace
- » Exams: online

