Hybrid Professional Master's Degree Update in Diagnostic and Therapeutic Techniques in Radiology



PHILIPS



### Hybrid Professional Master's Degree Update in Diagnostic and Therapeutic Techniques in Radiology

Course Modality: Hybrid (Online + Clinical Internship) Duration: 12 months. Certificate: TECH Technological University Teaching Hours: 1,620 hours. Website: www.techtitute.com/in/medicine/hybrid-professional-master-degree/hybrid-professional-master-degree-update-diagnostic-therapeutic-techniques-radiology

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# 01 Introduction

New radiological techniques have made it possible to perform less invasive studies on millions of patients. Advances in Radiology have become the great alternative to surgical interventions. In this sense, radiotherapy represents a key opportunity for the rehabilitation of sick people who cannot face direct intervention. X-ray biopsies, ultrasound scans, computed tomography and magnetic resonance imaging are some of the findings that science has obtained from the relationship between medicine and technology. In fact, for professionals working in this field in the current context, it is essential to have a specialization focused on telemedicine and artificial intelligence. TECH has developed a theoretical-practical program that meets the demand of professionals and focuses on neuroradiology, embolotherapy, vascular diagnosis and therapy, as well as venous and lymphatic interventionism.

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This program not only offers you the best theoretical contents, but also the possibility of applying them in practice in a prestigious hospital center"

### tech 06 | Introduction

Thanks to the application of technology in medicine, patient rehabilitation techniques are much less invasive. This not only allows their application in certain sick people, but also reduces the side effects and risks of surgical interventions. Given the great incorporation of technological advances in clinical procedures, the healthcare market demands professionals with great skills and knowledge in the most innovative techniques and tools.

For this reason, TECH offers a Hybrid Professional Master's Degree in Update in Diagnostic and Therapeutic Techniques in Radiology that not only aims to expand and update the knowledge of radiologists, but also to complete their theoretical instruction with a unique practical experience. This program is developed in a period of 100% online content that explores radiological advances in cerebrovascular disease, radiological application in pathologies affecting the airspace, mediastinum and pleura, as well as the most accurate assessment in focal and diffuse liver pathology, in addition to the recognition of sports muscle injuries with ultrasound and MRI, among many other issues.

In addition, TECH proposes an internship period of 3 weeks in which the specialists will develop their practical skills in reference hospital centers. During this period of instruction in the real scenario, the physicians will be tutored by assistant radiologists, who will guarantee their correct intervention in each case. It is a multidisciplinary program that provides academic flexibility to specialists and gives them the opportunity to update their radiological knowledge with the most innovative clinical tools *in situ*.

This Hybrid Professional Master's Degree in Update in Diagnostic and Therapeutic Techniques in Radiology Ccontains the most complete and up-to-date scientific program on the market. The most important features include:

- Development of more than 100 clinical cases presented by medical professionals with expertise in intensive care and university professors with extensive experience in the critical patient
- The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- TBI assessment and evaluation of demyelinating diseases
- Analysis of infections and the study of the pituitary gland
- Assessment of neoplasms of the oral cavity, larynx and pharynx (ENT)
- Analysis of thoracic trauma and examination of the heart
- Application of techniques and indications for Urology evaluation
- Examination of muscle-tendon injuries
- · Workshops on application of imaging techniques in ovarian cancer
- · Abdominal aortography and arteriography of lower limbs, with their own treatments
- Assessment of cerebral arteriography and Wada test
- · Analysis of vertebroplasty, vesselplasty and kyphoplasty
- All this will be complemented by 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.
- Furthermore, you will be able to carry out a clinical internship in one of the best hospitals.

### Introduction | 07 tech

Expand now your professional experience with the collaboration of teachers and experts in the neuroradiology area who will guide you in the study of the specialty"

This Master's program, which has a professionalizing nature and a hybrid learning modality, is aimed at updating medical professionals who perform their functions in Radiology units and require a high degree of qualification.

The content is based on the latest scientific evidence and is organized in a didactic way to integrate theoretical knowledge into nursing practice. The theoretical-practical elements allow professionals to update their knowledge and help them to make the right decisions in patient care.

Thanks to the multimedia content, developed with the latest educational technology, medical professionals will benefit from situated and contextual learning, i.e., a simulated environment that will provide immersive learning programmed to train in real situations. This program is designed around Problem-Based Learning, whereby the physician 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 developed by renowned experts.

Take an intensive 3-week internship in a prestigious center and explore all the knowledge in clinical innovation applied to radiology.

Expand now your professional experience with the collaboration of teachers and experts in the neuroradiology area who will guide you in the study of the specialty.

## 02 Why Study this Hybrid Professional Master's Degree?

The evolution in Diagnostic and Therapeutic Techniques in Radiology has highlighted the transcendental importance of this hospital unit, which proposes an unbeatable field of action for specialists in the area. On many occasions, a purely theoretical update proves to be insufficient, since the practical field advances at a pace that only theory is unable to cover. For this reason TECH has created this Hybrid Professional Master's Degree, in which the specialist will have access to the most rigorous scientific postulates in Radiology and then put them into practice during an intensive and exhaustive internship. Why Study this Hybrid Professional Master's Degree? | 09 tech

This academic opportunity is unique, as you will find the opportunity to update yourself in Diagnostic and Therapeutic Techniques in Radiology both at a theoretical and practical level"

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## **tech** 10 | Why Study this Hybrid Professional Master's Degree?

### 1. Updating from the latest technology available

In an area so marked by technology such as Radiology, it is of utmost importance to have access to the latest equipment and techniques available. Thanks to this Hybrid Professional Master's Degree, the student will have access to the most advanced radiology equipment, delving into its use and impact on routine clinical practice.

### 2. Gaining In-Depth Knowledge from the Experience of Top Specialists

The entire syllabus of this Hybrid Professional Master's Degree has been written by a team of radiologists with extensive experience, which in itself gives a practical vision to all the topics covered. In addition, during the clinical internship the specialist will be surrounded by a team of experts in the area, which means that throughout the program they will be acquiring the experience of leading radiologists in their field.

### 3. Entering First-Class Clinical Environments

The clinical centers selected by TECH for this degree meet the highest requirements of quality and level of care. Therefore, the specialist will have a guaranteed first-class stay, being able to get up-to-date not only in the most important technology, but also in the day-to-day life of a modern and avant-garde Radiology Unit.





## Why Study this Hybrid Professional | 11 **tech** Master's Degree?

### 4. Combining the Best Theory with State-of-the-Art Practice

Thanks to the extensive experience of the teaching staff in all types of interventions and diagnostic techniques, the theory is perfectly adapted and aimed at the most effective update for the specialist. This, combined with a demanding but rewarding clinical internship, will be an endorsement of distinction in the updating of the specialist in the field of Radiology.

### 5. Expanding the Boundaries of Knowledge

Thanks precisely to the combination of theory and practice unique to this degree, the specialist will be able to expand both their skills and their own work methodology towards the most modern Radiology, adapting to the most effective processes and techniques currently in use.



**66** You will have full practical immersion at the conter of immersion at the center of your choice"

# 03 **Objectives**

The design of this Hybrid Professional Master's Degree will allow students to acquire the necessary skills to update their knowledge in embolotherapy, vascular diagnosis and therapy, venous and lymphatic interventionism, musculoskeletal system (MSK), as well as neuroradiology, among other aspects. The knowledge acquired in the development of the points of the syllabus will drive the professional from a global perspective, with full capacity to achieve the proposed goals. In this way, the specialist will develop a broad competence in cerebrovascular and neurodegenerative diseases, in addition to other medical skills. To this end, TECH establishes a series of general and specific objectives to fulfill future graduates' expectations.



This program will allow you to update your knowledge from a real scenario, with the maximum scientific rigor of an institution that applies medical technology in hemotherapy"

### tech 14 | Objectives



### **General Objective**

 The general objective of the Hybrid Professional Master's Degree in Update in Diagnostic and Therapeutic Techniques in Radiology is to ensure that the professional keeps up-to-date with the diagnostic and therapeutic procedures of the specialty, through a hospital internship. The specialists will be guided by attending professionals from prestigious hospitals with the latest technological innovation. In addition, in this practical qualification, the professional will develop their level of knowledge in radiological diagnosis and therapy in the subspecialties of Neurology, Sense Organs, Pneumology, Cardiology, Gastroenterology, Urology, Traumatology, Women's Pathology and Angiology. This will allow them to improve and enhance their skills in the medical care of patients.

> This updating program will bring professional benefits to the physician also in praxis, such as the development of new therapies for the future and other therapeutic modalities"



### Objectives | 15 tech





### **Specific Objectives**

### Module 1. Neuroradiology

- Recognize radiological advances in cerebrovascular disease and protocolize the radiologist's actions in the code stroke
- Analyze the image findings in craniocerebral trauma
- Identify the MR semiology of demyelinating diseases and evaluate the response to treatment
- Describe the radiological findings in dementia and neurodegenerative diseases
- Know the basic concepts of cerebral malformations and evaluate the types of hydrocephalus
- Evaluate infectious diseases with neuroaxis involvement
- Recognize the pathological signs of the hypothalamic-pituitary axis
- Evaluate CT and MRI findings of CNS neoplasms
- Know the different evaluation systems for the response to treatment in CNS neoplasms
- Discriminate between treatment response, pseudoresponse, pseudoprogression and disease progression

### Module 2. Sensory Organs

- Analyze the findings of diagnostic radiology techniques in ophthalmologic pathology
- Describe the radiological semiology of skull trauma
- Identify the signs in different radiological techniques for use in nasosinusal pathology
- Know how to stage pharyngeal and laryngeal neoplasms radiologically

### tech 16 | Objectives

### Module 3. Chest

- Recognize in the different radiological techniques the pathology affecting the airspace, mediastinum and pleura
- Diagnose and stage lung cancer using radiological techniques
- Evaluate the response to lung cancer treatment
- Describe the radiological semiology of thoracic vascular pathology
- Evaluate the anatomy and cardiac pathology with CT and MRI
- Recognise the latest advances in a cardiac CT and cardiac MRI

### Module 4. Abdomen

- Gain an up-to-date knowledge the different radiological contrasts for ultrasound, CT and MRI
- Precisely evaluate focal and diffuse liver pathology
- Evaluate the pathology of the biliary tract with radiological techniques
- Evaluate the seriousness of acute pancreatitis with CT
- Stage and evaluate the response to pancreas cancer treatment
- Analyze the radiological semiology of splenic lesions
- Diagnose and evaluate the response to radiological technique treatments for inflammatory bowel disease
- Systematize the reading and radiological evaluation of peritoneal carcinomatosis
- Identify poor prognostic signs of rectal cancer with MRI. Local staging
- Recognise the advances in assessing the response to treatment with imaging diagnostic techniques in rectal cancer
- Evaluate the technique, indications and semiology of virtual colonoscopy with CT
- Analyze the findings of radiological techniques in pelvic floor pathology
- Recognize the radiological semiology of urological neoplasms
- Systematize the reading and radiologic report of prostate cancer with PI-RADS

### Module 5. Musculoskeletal System (MSK)

- Analyze the radiological findings of disc and joint pathology of the spine
- Identify the changes produced by trauma pathology and spinal neoplasm
- Evaluate the radiological semiology (X-ray, ultrasound and MRI) of rotator cuff pathology
- Recognize injuries secondary to gleno-humeral dislocation with radiological techniques
- Systematize the technique of joint puncture for arthrography
- Analyze trauma and degenerative pathology of the wrist with radiological techniques
- Diagnose pelvic injuries with MRI
- Recognize the different types of meniscus tears with MRI
- Identify the normal anatomy and the semiology of knee ligament injuries
- Evaluate cartilaginous lesions of the knee and arthropathies
- Analyze post-traumatic lesions of the ankle with imaging techniques
- Use ultrasound and MRI to recognize sporting muscle injuries

#### Module 6. Breast

- Update protocols for medical patient management in breast and gynecologic pathology
- Identify and use multiparametric studies in radiodiagnosis
- Revise the technological advances for the study of breast pathology (elastography, tomosynthesis and contrast mammography)
- Systematize the reading and radiologic report of breast cancer with BI-RADS
- Systematize percutaneous sampling with FNA or BAG in breast pathology
- Analyze the findings for the correct local staging of breast cancer
- Assess the response to treatment of breast cancer with radiological techniques

### Objectives | 17 tech

### Module 7. Gynecology

- Identify imaging findings in benign pathology of the uterus and adnexa
- Stage the neoplasms of the uterus and cervix
- Analzye the semiology in the different radiological techniques in ovarian cancer

### Module 8. Trending topic

- Revise the technological advances in image biomarkers
- Analyze the technique and indications of dual-energy CT
- Evaluate the methodology of multiparametric studies in radiology

### Module 9. Management in Radiology

- Update the specialist on the latest trends in the management of a radiology service
- Identify the ICT advances involved in the radiology process
- Revise the importance of radiological information and the evolution towards a structured report
- Analyze the medical-legal implications in radiological practice BORRAR

### Module 10. Basis of Intervention Procedures

- Identify the basis of second level radiological protection for interventional radiology
- Differentiate the basis of percutaneous accesses in image-guided therapy
- Correctly apply ultrasound-guided puncture techniques as a support in the different imageguided therapy techniques
- Know the basics of wound care and catheters, as well as vascular accesses and the different techniques of sealing, compression and percutaneous sutures

### Module 11. Materials in Interventional Techniques

- Know the basic and advanced access materials in neurointerventional procedures
- Distinguish the different materials used in vascular interventional procedures
- Know the materials used for endovascular treatments in oncologic interventionism
- Know the different materials used for vascular accesses and treatments in musculoskeletal interventional procedures
- Apply the different materials for percutaneous drainage, biopsy and puncture in nonvascular interventional procedures

### Module 12. Venous and Lymphatic Interventional Procedures

- Identify invasive diagnostic techniques in venous pathology of upper and lower limbs
- Review the latest evidence in superior and inferior vena cava tumor obstructive pathology
- Analyze the latest advances in venous thromboembolic disease
- Increase knowledge of central venous access techniques and placement of catheters and central venous devices
- Percutaneous management of intravenous dialysis catheters
- Increase knowledge about percutaneous lymphatic venous system access and invasive diagnosis and therapy of the lymphatic system
- Apply indications and techniques for transjugular liver biopsy and hepatic hemodynamic study as , well as venous sampling
- Distinguish the different percutaneous techniques and strategies for the treatment of venous insufficiency in the lower extremities

### Module 13. Vascular Diagnosis

• Gain up-to-date knowledge on invasive vascular diagnostic procedures at the level of the thorax, abdomen and lower limbs

### tech 18 | Objectives

### Module 14. Vascular Therapy

- Increase knowledge of dilatation and stenting techniques in the peripheral vascular system
- Describe the techniques of thrombectomy and fibrinolysis of the peripheral vascular system
- Gain up-to-date knowledge on the techniques of exoplasty and vascular recanalization in the abdominal visceral trunks
- Correctly apply the treatment of aneurysmal disease at the level of the visceral trunks of the abdominal aorta
- Recognize the differences between the techniques of endoprosthesis implantation in aortic
  aneurysms
- Review the latest revascularization techniques in the treatment of the diabetic foot
- Gain up-to-date knowledge procedures for stenting, tightening and balloon dilations in the peripheral vascular system

### Module 15. Embolotherapy

- Gain up-to-date knowledge non-invasive diagnostic procedures for the detection of arterial
  and venous bleeding
- Increase knowledge of non-invasive diagnostic techniques in the study of vascular malformations
- Recognize and apply the indications for treatment by embolotherapy in the different vascular territories and clinical scenarios
- Review the latest endovascular image-guided embolotherapy techniques
- Describe the treatment of emergencies in embolotherapy

### Module 16. Diagnostic Punctures

- Compare and evaluate the basic techniques of puncture biopsy
- Provide basic and advanced knowledge for the proper development of biopsy puncture techniques in the different visceral territories using imaging methods



### Objectives | 19 tech

### Module 17. Diagnostic Neurointerventionism

• Gain up-to-date knowledge of invasive diagnostic procedures by intracerebral and spinal arterial catheterization, as well as venous sampling techniques and intracerebral pharmacological provocation

#### Module 18. Therapeutic Neurointerventionism

- Review the latest endovascular techniques for the treatment of cerebral aneurysms
- Describe the treatment of neurointerventional emergencies (epistaxis and hemorrhages in the otorhinolaryngological area)
- Gain up-to-date knowledge on the diagnostic and therapeutic algorithm for dural fistulas and intracerebral arteriovenous malformations
- Recognize pre-surgical tumor embolization techniques in neuroradiology

### Module 19. Musculoskeletal Interventionism

• Examine the latest developments in interventional techniques for vertebroplasty, infiltration, epidurolisis and ganglion block, among others

### Module 20. Urologic Interventionism

• Delve deeper into urological interventionism and the techniques of antegrade and retrograde insertion of Double J catheter

### Module 21. Thoracic Interventionism

• Study the latest developments in thoracic abscess drainage, thoracentesis and techniques associated with thoracic interventionism

### Module 22. Puncture Drainage

• Evaluate the main techniques of puncture drainage in interventional radiology, including biliary drainage, abscess drainage and percutaneous gastrostomy

### Module 23. Ablative techniques

• Correctly apply the different ablative techniques used in image-guided therapy in oncology

### Module 24. Other Aspects of Interest in Interventional Radiology.

• Examine the future of interventional radiology such as the use of nanoparticles

### Module 25. Management and Organization in Image-Guided Therapy

- Update the use of informed consent in interventional radiology
- Learn about the legal aspects of informed consent in image-guided therapy and its implications
- Increase knowledge about how to set up a consultation in image-guided therapy and its development
- · Gain an up-to-date knowledge of anesthesia in interventional radiology
- Know the management of ultrasound-guided locoregional block techniques, sedation and analgesia protocols and management of common drugs in sedation and anesthesia
- Review the medical management protocols in general and interventional radiology
- Describe the most common medical protocols in the pathologies treated in Radiology services
- Apply the appropriate treatment in vascular and non-vascular interventional radiology
- Increase knowledge of the medication commonly used in neurointerventional procedures
- Evaluate management models in interventional radiology: RVUs, DRGs, Indicators
- Describe the basic management tools in hospital processes and their implication in management
- Evaluate management models in interventional radiology: RVUs, DRGs, Indicators

## 04 **Skills**

After completing the Hybrid Professional Master's Degree in Update in Diagnostic and Therapeutic Techniques in Radiology, the specialist will have acquired the necessary professional skills to assess and analyze various pathologies using imaging techniques. In addition, they will reinforce their critical reading of the EPO. And in turn, they will obtain the guidelines to refer drainage and radiodiagnostic techniques to other specialists. In addition, the specialist will develop their learning in very diverse clinical and epidemiological contexts.



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Thanks to this program you will be able to update your knowledge in vesselplasty and kyphoplasty, as well as in facet rhizolysis"

Skills | 21 tech

### tech 22 | Skills



**General Skills** 

- Develop within the profession in terms of working with other health professionals, acquiring skills to work as a team
- Recognize the need to maintain your professional skills and keep them up to date, with special emphasis on autonomous and continuous learning of new information
- Develop the capacity for critical analysis and research in your professional field

You will combine theory and professional practice through a demanding and rewarding educational approach"



### Specific Skills

- Describe the radiologic semiology of virtual colonoscopy with CT, ligament injuries of the knee, ovarian cancer, demyelinating diseases, traumatic disc disease, thoracic vascular pathology, splenic lesions, rotator cuff pathology, urologic neoplasms
- Analyze the radiological advances in cerebrovascular disease, in cardiac CT and cardiac MRI, in the assessment of response to treatment with imaging diagnostic techniques in rectal cancer, in the study of breast pathology and in imaging biomarkers
- Describe radiological findings in cranioencephalic trauma, imaging biomarkers, phakomatosis, ophthalmologic pathology, pelvic floor pathology, disc and joint pathology of the spine and in benign pathology of the uterus and adnexa
- Define and differentiate between treatment response, pseudoresponse, pseudoprogression and disease
- Identify the pathology affecting the airspace, mediastinum and pleura in radiology
- Evaluate the pathology of the biliary tract with radiological techniques
- Diagnose and evaluate the response to radiological technique treatments for inflammatory bowel disease

- Systematize the reading and radiologic report of prostate cancer with PI-RADS
- Identify the changes produced by trauma pathology and spinal neoplasm
- Use ultrasound and MRI to recognize sporting muscle injuries
- Systematize the reading and radiologic report of breast cancer with Bi-RADS
- Analyze the findings for the correct local staging of breast cancer
- Assess the response to treatment of breast cancer with radiological techniques
- Incorporate the protocols for medical management in diseases commonly managed in Interventional Radiology and Diagnostic Radiology
- Identify the architectural and technical requirements required for the implementation of an image-guided therapy service or image-guided therapy
- Complete knowledge of the subject with some non-systematizable techniques and expand the vision of Interventional Radiology with new horizons based on new methods

## 05 Educational Plan

The contents of this program have been carefully designed by highly experienced specialists in the sector. This teaching staff not only guarantees the rigorousness of the syllabus, but also instructs the specialists with personalized tutorials. With this program, students will learn more about embolotherapy, vascular diagnosis and therapy, venous and lymphatic interventionism, musculoskeletal system (MSK), as well as neuroradiology, among other aspects. From the first module, the expert will expand their knowledge in cerebrovascular and neurodegenerative diseases, in addition to exploring the sense organs and pathologies in the thorax and abdomen. All this, supported by a team that guarantees flexible and progressive study.

LOPO 1 ThoraxRoutine (Adult)

Topogram

ThorRoutine

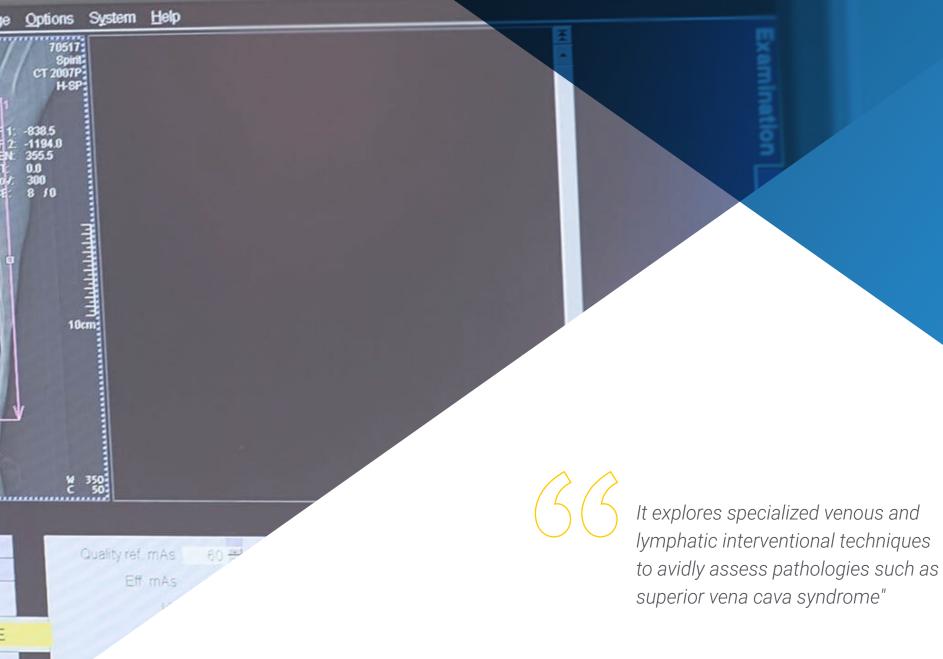
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### tech 26 | Educational Plan

### Module 1. Neuroradiology

- 1.1. Cerebrovascular Disease
- 1.2. TBI.
- 1.3. Demyelinating Diseases:
- 1.4. Dementia and Neurodegenerative Diseases
- 1.5. Basic Aspects of Cerebral Malformations. Hydrocephalus
- 1.6. Infections
- 1.7. Study of the Pituitary Gland
- 1.8. Spinal Cord Injuries
- 1.9. Central Nervous System Tumors
- 1.10. Monitoring and Assesment in Response to Supratentorial CNS Tumors
- 1.11. Advanced Techniques in Neuroradiology (Diffusion, Perfusion, Spectroscopy)

### Module 2. Sensory Organs

- 2.1. Ophthalmologic Pathology
- 2.2. Study of the Base of the Skull
- 2.3. Nasosinusal Pathology
- 2.4. Neoplasms of the Oral Cavity, Larynx and Pharynx (ENT)

### Module 3. Chest

- 3.1. Airspace Pathology
- 3.2. Pleural Pathology
- 3.3. DILD (Diffuse Interstitial Lung Diseases)
- 3.4. COPD (Chronic Obstructive Pulmonary Disease)
- 3.5. Infections
- 3.6. Lung Cancer
  - 3.6.1. Diagnosis and Staging
  - 3.6.2. Monitoring and Response Assessment
- 3.7. Mediastinal Tumors
- 3.8. Vascular Pathology
- 3.9. Thoracic Trauma.

#### 3.10. Heart

- 3.10.1. Cardiac CT
- 3.10.2. Cardiac MRI
- 3.10.3. Management of Ischemic Heart Disease
- 3.10.4. Cardiomyopathies
- 3.10.5. Valvulopathies
- 3.10.6. Congenital Diseases
- 3.10.7. Tumours

### Module 4. Abdomen

- 4.1. Iodinated, Gadolinium (Gd)-Based and Enteral Contrast Agents
- 4.2. Liver
  - 4.2.1. Focal Liver Lesion
  - 4.2.2. Diffuse Liver Disease
  - 4.2.3. Management of Cirrhosis Liver
  - 4.2.4. Study and Pathology of the Biliary Route
- 4.3. Pancreas.
  - 4.3.1. Pancreatitis
  - 4.3.2. Pancreatic Cancer
- 4.4. Splenic Lesions
- 4.5. Inflammatory Bowel Disease
- 4.6. Peritoneal Carcinomatosis
- 4.7. Staging and Response Assessment in Rectal Cancer
- 4.8. Technique and Indications of CT Colonoscopy
- 4.9. Defecography: Technique and Indications
- 4.10. Urology
  - 4.10.1. Renal, Ureteral and Bladder Cancer
  - 4.10.2. Multiparametric Study of Prostate Cancer. PI-RADS
  - 4.10.3. Testicular Cancer.

### Educational Plan | 27 tech

### Module 5. Musculoskeletal System (MSK)

- 5.1. Rotator Cuff Pathology
- 5.2. Glenohumeral Instability
- 5.3. Degenerative Wrist Pathology
- 5.4. Degenerative Wrist Trauma
- 5.5. Degenerative Spine Pathology
- 5.6. Meniscal Pathology
- 5.7. Knee Ligament Pathology
- 5.8. Cartilage and Knee Arthropathy
- 5.9. Ankle Trauma Lesions
- 5.10. Tendon Injuries

#### Module 6. Breast

- 6.1. Advances in Breast Imaging Techniques
- 6.2. Breast Cancer Screening and Bi-RADS System
- 6.3. FNA and Breast BAG
- 6.4. Breast Cancer Staging
- 6.5. Monitoring and Response Assessment in Breast Cancer

#### Module 7. Gynecology

- 7.1. Radiology of the Benign Pathology of the Uterus and Adnexa
- 7.2. Staging in Uterine and Cervical Cancer
- 7.3. Imaging Techniques in Ovarian Cancer

#### Module 8. Trending topic

- 8.1. Biomarkers in Imaging
- 8.2. Dual-Energy CT
- 8.3. Multiparametric Studies in Radiology

### Module 9. Management in Radiology

- 9.1. Radiology Services Management
- 9.2. PACS (Picture Archiving and Communications System). RIS (Radiological Information Systems). Teleradiology
- 9.3. Radiological Report
- 9.4. Medical-Legal Aspects in Radiology BORRAR

### Module 10. Basis of Intervention Procedures

- 10.1. Radiological Protection in Interventional Procedures
- 10.2. Arterial and Venous Puncture for Interventional Access: Seldinger and Trocar Technique
- 10.3. Ultrasound Puncture for Vascular Access
- 10.4. Compression of Puncture Sites and Care

#### Module 11. Materials in Interventional Techniques

- 11.1. Materials in Neurointerventionism
- 11.2. Materials in Vascular Interventional Techniques
- 11.3. Materials in Oncologic Interventional Techniques
- 11.4. Materials in Musculoskeletal Interventional Techniques
- 11.5. Materials for Drainages and Non-Vascular Interventional Techniques

#### Module 12. Venous and Lymphatic Interventional Procedures

- 12.1. Phlebography of the Upper and Lower Limbs. Cavography
- 12.2. Superior Vena Cava Syndrome
- 12.3. Pulmonary Embolism and Deep Vein Thrombosis
- 12.4. Central Routes, Port a Cath, PICS
- 12.5. Diagnostic and Therapeutic Lymphography
- 12.6. Inferior Vena Cava Filter Placement
- 12.7. Dialysis Catheter Placement, Replacement and Removal
- 12.8. Angioplasty and Thrombectomy of Vascular Access for Dialysis
- 12.9. Transjugular Liver Biopsy, Hepatic Hemodynamic Study and Hepatic Venous Sample
- 12.10. Treatment of Venous Insufficiency in Lower Limbs

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### Module 13. Vascular Diagnosis

- 13.1. Abdominal Aortography and Arteriography of Lower Limbs
- 13.2. Arteriography of Visceral Digestive Trunks

#### Module 14. Vascular Therapy

- 14.1. Peripheral Vascular Angiopathy and Stents
- 14.2. Arterial Thrombolysis of Lower Limbs and Percutaneous Thrombectomy
- 14.3. Percutaneous Vascular Closures
- 14.4. ATP of Renal Arteries and Stent
- 14.5. ATP and Stenting of Visceral Digestive Trunks
- 14.6. Aneurysms in Visceral Arteries. Diagnosis and Treatment
- 14.7. Aortic Aneurysms. Endoprosthesis
- 14.8. Treatment of Diabetic Foot

#### Module 15. Embolotherapy

- 15.1. Upper and Lower Gastrointestinal Bleeding
- 15.2. Renal Embolization
- 15.3. Embolization in Trauma
- 15.4. Prostate Embolization
- 15.5. Uterine Embolization
- 15.6. Portal Embolization
- 15.7. Hepatic Chemoembolization
- 15.8. Hepatic Debiri

#### Module 16. Diagnostic Punctures

- 16.1. Image-Guided Percutaneous Biopsy. FNA
- 16.2. Renal Biopsy.
- 16.3. Hepatic biopsy
- 16.4. Pulmonary Biopsy
- 16.5. CT- Guided Biopsy

### Module 17. Diagnostic Neurointerventionism

- 17.1. Cerebral Arteriography
- 17.2. Spinal Arteriography
- 17.3. Petrosal Sinus Sampling
- 17.4. Wada Test

#### Module 18. Therapeutic Neurointerventionism

- 18.1. Embolization of Cerebral Aneurysms
- 18.2. Treatment of Cerebral Vasospasm
- 18.3. Carotid Stent, Vertebral Stent and Cerebral Stent
- 18.4. Endovascular Treatment of an Ischemic Stroke
- 18.5. Embolization in Epistaxis
- 18.6. Embolization of Cerebral Meningiomas and Paragangliomas
- 18.7. Treatment of Intracerebral AVMs
- 18.8. Dural Fistulas, Diagnosis and Treatment
- 18.9. Spinal Vascular Malformations

#### Module 19. Musculoskeletal Interventionism

- 19.1. Discography
- 19.2. Vertebroplasty, Vesselplasty and Kyphoplasty
- 19.3. Infiltration and Facet Rhizolysis
- 19.4. Percutaneous Discectomy
- 19.5. Epidurolisis and Pain Management
- 19.6. Percutaneous Ganglionic Block for Pain
- 19.7. Joint Infiltrations

#### Module 20. Urologic Interventionism

- 20.1. Percutaneous Nephrostomy
- 20.2. Anterograde Double J
- 20.3. Retrograde Double J and Endourological Interventionism
- 20.4. Ureteral and Urethral Endoprosthesis

### Educational Plan | 29 tech

### Module 21. Thoracic Interventionism

- 21.1. Thoracentesis, Thoracic Drainage and Associated Techniques
- 21.2. Drainage of Thoracic Abscesses

### Module 22. Puncture Drainage

- 22.1. Biliary Drainage
- 22.2. Drainage of Abscesses. Approaches and Technique
- 22.3. Percutaneous Gastrostomy and Gastrojejunostomy
- 22.4. Percutaneous Cholecystostomy

### Module 23. Ablative techniques

- 23.1. Tumor Ablation with Radiofrequency and Microwaves
- 23.2. Tumor Cryoablation. Irreversible Electroporation.

#### Module 24. Other Aspects of Interest in Interventional Radiology.

- 24.1. Extraction of Foreign Bodies
- 24.2. Multimodality Fusion
- 24.3. Nonoparticles. Future of Interventional Radiology

#### Module 25. Management and Organization in Image-Guided Therapy

- 25.1. Informed Consent in Interventional Radiology BORRAR
- 25.2. The Outpatient Clinic and the Interventional Radiology Department
- 25.3. Anaesthesia in Interventional Radiology
  - 25.3.1. Local anesthetics
  - 25.3.2. Sedation and Analgesia
  - 25.3.3. Nerve Blocks
- 25.4. Medical Management Protocols in General and Interventional Radiology
- 25.5. Medication Used in Neurointerventionism
- 25.6. Medication Used in Vascular and Non-Vascular Interventionism
- 25.7. Management in Interventional Radiology: RVUs, DRGs, Indicators
- 25.8. Intervention Rooms

# 06 Clinical Internship

After completing the period of online theoretical contents, the degree includes an internship in a renowned clinic for its prestige in radiological studies. Over the course of the program, the specialist will have the professional support of experts in the sector and will be able to resolve doubts about real cases in situ.

Expand your professional knowledge by being part of a clinical team that daily attends a multitude of patients with cranial pathologies"

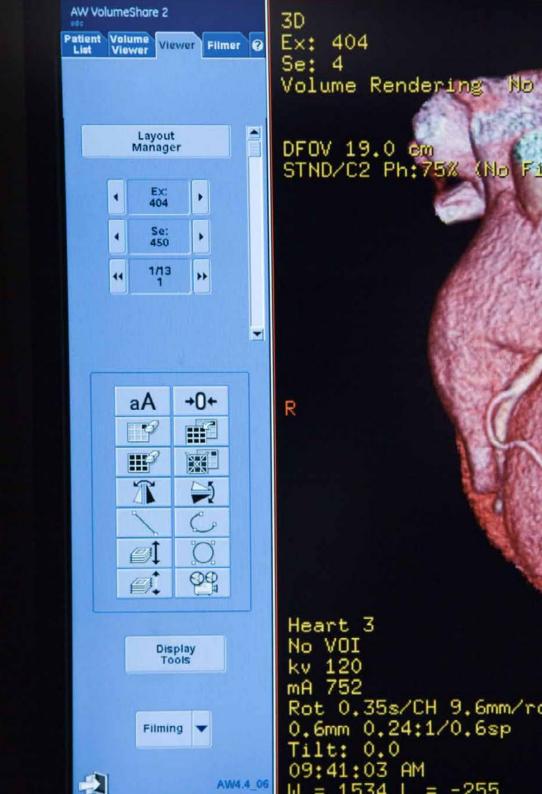
### tech 32 | Clinical Internship

The Internship period of this Hybrid Professional Master's Degree in Update in Diagnostic and Therapeutic Techniques in Radiology is developed over 3 weeks with a thorough preparation in the field of new methods and technological incorporations in radiological tests. The specialist will work in a real scenario for 8 hours from Monday to Friday, with the guidance of clinical experts. In this way, the physician will delve into radiodiagnostic tools by treating first hand patients with various pathologies.

Having seen the speed of clinical advances that have been made on radiological research, TECH has developed a theoretical-practical program. Therefore, the specialist will analyze, through the most direct way, the update in dementia and neurodegenerative diseases, the study of cranial bases, assessment of COPD, analysis of peritoneal carcinomatosis, among many other medical skills. In addition, they will be provided with all the clinical material so that they can put their previous theoretical knowledge into practice with real patients.

The internship is an enriching and rigorous opportunity that will promote the multidisciplinary training of the physician and boost their professional career. At the same time, the center's tutors will ensure that the specialists develop competencies in the different pathologies that require Radiology. They will also be able to participate in the gynecological sector with the application of imaging techniques in ovarian cancer and the practice of FNA and breast BAG. All this, with the guarantee of correctly performing the medical practice, together with experts who have years of experience in the health center.

The procedures described below will form the basis of the practical part of the training, and their implementation is subject to both the suitability of the patients and the availability of the center and its workload, with the proposed activities being as follows:



### Clinical Internship | 33 tech

Module	Practical Activity		
Radiodiagnostics	Manage the latest technology in Ultrasound and Computed Tomography		
	Make use of high quality Magnetic Resonance Imaging equipment		
	Know the organization of combined radiological diagnostics in a modern Radiology Ur		
	Perform a DIDD (Diffuse Interstitial Pulmonary Interstitial Diseases) examination		
	Assess the diagnosis of COPD in a patient		
	Analyze thoracic trauma, mediastinal tumors or pancreatic and pulmonary patholog		
Interventional Radiology	Perform cystography		
	Performing abscess drainage		
	Address aneurysm embolization		
	Placing inferior vena cava filter and dialysis catheters and their replacements		
	Perform intracerebral AVM Treatment		
Radiodiagnosis by Organs and Systems	Know the available technology in defecography		
	Practice FNA and mammary BAG		
	Apply imaging techniques in ovarian cancer		
	Perform aneurysm treatment and diabetic foot treatment		
	Perform musculotendinous lesion examination		
Minimally Invasive Techniques in Interventional Radiology	Perform fine needle punctures of arteries or veins, closing the area by hemostasis v closure devices or manual compression		
	Assess the use of drainage of collections in patients with abscesses in various are		
	Use TIPS placement in patients with chronic liver disease, refractory ascites or secondary gastrointestinal bleeding		
	Place gastrostomies in patients with esophageal or ENT tumors		
	Avoid the risk of PTE in patients with venous thrombosis of the lower limbs by place inferior vena cava filters		
	Perform artery scans and complex studies using multislice CT		
Modern Technology in the Radiodiagnostic Area	Review the use of high-field closed MRI in patients with obesity or claustrophobia		
	Perform stereotactic interventions with digital mammography with tomosynthesis		
	Employ low-radiation 3D vertical radiological systems		
	Get involved in the use of different ultrasound equipment, portable echocardiography gynecological ultrasound and orthopantomograph		

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### tech 34 | Clinical Internship

### **Civil Liability Insurance**

This institution's main concern is to guarantee the safety of the trainees and other collaborating agents involved in the internship process at the company. Among the measures dedicated to achieve this is the response to any incident that may occur during the entire teaching-learning process.

To this end, this entity commits to purchasing a civil liability insurance policy to cover any eventuality that may arise during the course of the internship at the center.

This liability policy for interns will have broad coverage and will be taken out prior to the start of the practical training period. That way professionals will not have to worry in case of having to face an unexpected situation and will be covered until the end of the internship program at the center.



### **General Conditions of the Internship Program**

The general terms and conditions of the internship program agreement shall be as follows:

1. TUTOR: During the Hybrid Professional Master's Degree, students will be assigned with two tutors who will accompany them throughout the process, answering any doubts and questions that may arise. On the one hand, there will be a professional tutor belonging to the internship center who will have the purpose of guiding and supporting the student at all times. On the other hand, they will also be assigned with an academic tutor whose mission will be to coordinate and help the students during the whole process, solving doubts and facilitating everything they may need. In this way, the student will be accompanied and will be able to discuss any doubts that may arise, both clinical and academic.

**2. DURATION:** The internship program will have a duration of three continuous weeks, in 8-hour days, 5 days a week. The days of attendance and the schedule will be the responsibility of the center and the professional will be informed well in advance so that they can make the appropriate arrangements.

**3. ABSENCE**: If the students does not show up on the start date of the Hybrid Professional Master's Degree, they will lose the right to it, without the possibility of reimbursement or change of dates. Absence for more than two days from the internship, without justification or a medical reason, will result in the professional's withdrawal from the internship, therefore, automatic termination of the internship. Any problems that may arise during the course of the internship must be urgently reported to the academic tutor. **4. CERTIFICATION:** Professionals who pass the Hybrid Professional Master's Degree will receive a certificate accrediting their stay at the center.

**5. EMPLOYMENT RELATIONSHIP:** the Hybrid Professional Master's Degree shall not constitute an employment relationship of any kind.

**6. PRIOR EDUCATION:** Some centers may require a certificate of prior education for the Hybrid Professional Master's Degree. In these cases, it will be necessary to submit it to the TECH internship department so that the assignment of the chosen center can be confirmed.

7. DOES NOT INCLUDE: The Hybrid Professional Master's Degree will not include any element not described in the present conditions. Therefore, it does not include accommodation, transportation to the city where the internship takes place, visas or any other items not listed

However, students may consult with their academic tutor for any questions or recommendations in this regard. The academic tutor will provide the student with all the necessary information to facilitate the procedures in any case.

## 07 Where Can I Do the Clinical Internship?

This Hybrid Professional Master's Degree integrates in its program the internship in a renowned hospital clinic, where the specialist will be able to complete their academic education and will deal with all practical issues. This extension of the degree will take place during 3 weeks and will bring the hematologist closer to the daily challenges of the profession by facing real cases of hematological pathologies.

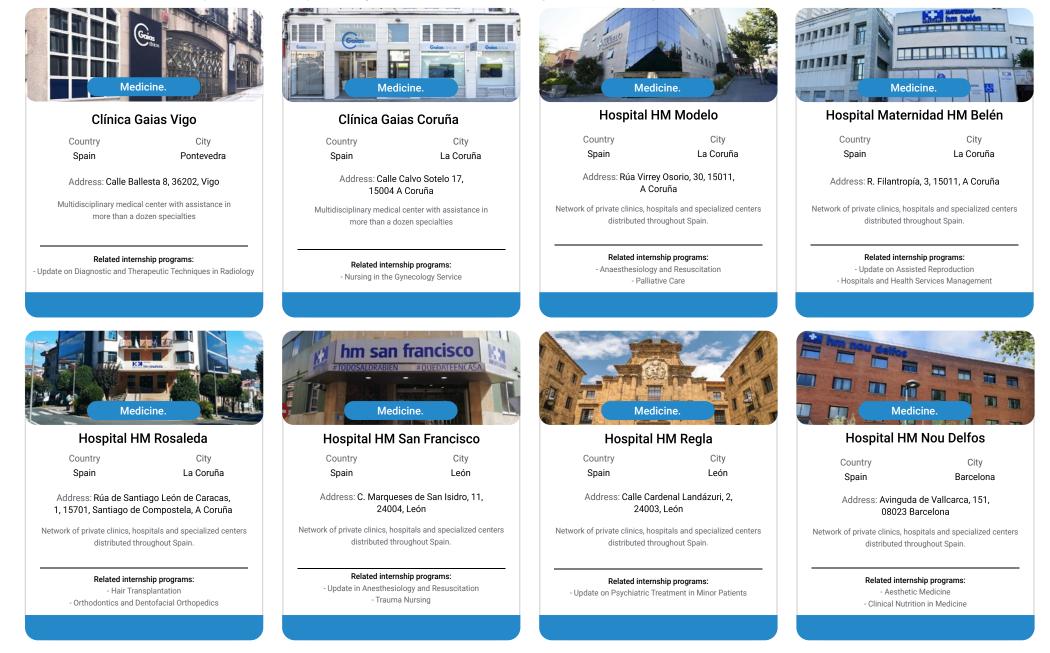
# Where Can I Do the Clinical Internship? | 37 tech

*Expand now your academic specialization with an internship in a hospital center, which will help you to develop daily clinical tasks"* 

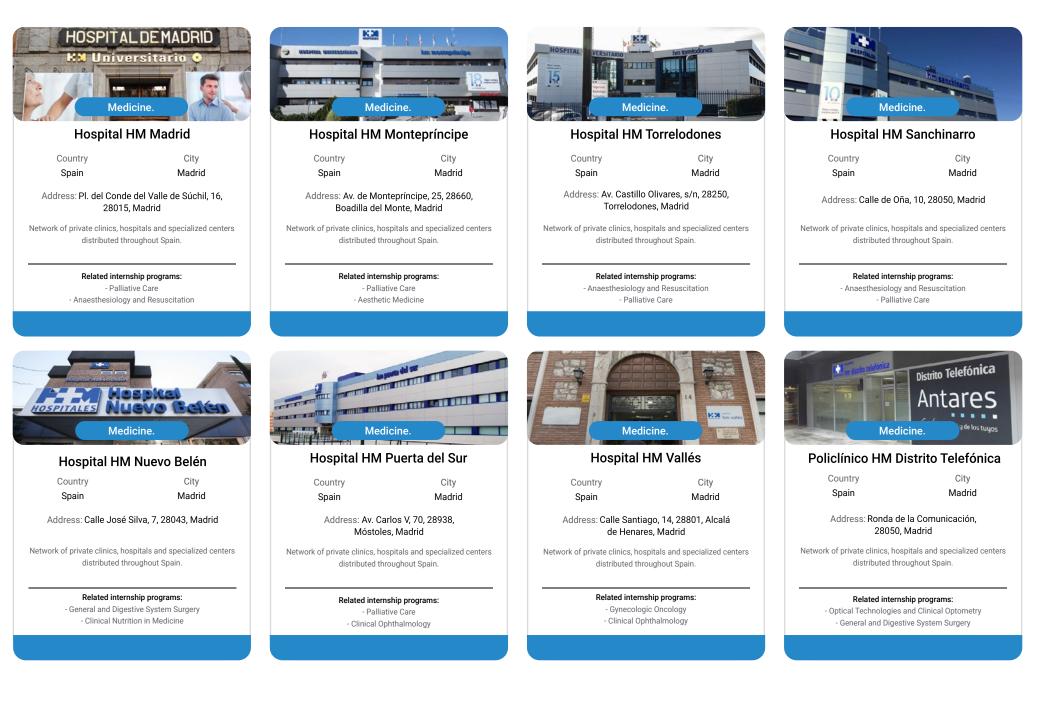
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# tech 38 | Where Can I Do the Clinical Internship?

The student will be able to complete the internship of this Hybrid Professional Master's Degree at the following centers:



## Where Can I Do the ClinicalInternship? | 39 tech



# tech 40 | Where Can I Do the Clinical Internship?

Madrid



Policlínico HM Gabinete Velázquez Country City

Spain

Address: C. de Jorge Juan, 19, 1° 28001, 28001, Madrid

Network of private clinics, hospitals and specialized centers distributed throughout Spain.

Related internship programs: - Clinical Nutrition in Medicine - Aesthetic Plastic Surgery



Policlínico HM Las Tablas Country City Spain Madrid

Address: C. de la Sierra de Atapuerca, 5, 28050, Madrid

Network of private clinics, hospitals and specialized centers distributed throughout Spain.

Related internship programs: - Trauma Nursing - Diagnosis in Physiotherapy



#### Policlínico HM Moraleja

Country	City
Spain	Madrid

Address: P.º de Alcobendas, 10, 28109, Alcobendas, Madrid

Network of private clinics, hospitals and specialized centers distributed throughout Spain.

Related internship programs: - Rehabilitation Medicine in Acquired Brain Injury Management





# Where Can I Do the Clinical Internship? | 41 tech



#### Policlínico HM Sanchinarro

Country Spain

Madrid

City

Address: Av. de Manoteras, 10, 28050, Madrid

Network of private clinics, hospitals and specialized centers distributed throughout Spain.

Related internship programs: - Gynecological Care for Midwives - Nursing in the Digestive Tract Department



#### Policlínico HM Imi Toledo

Country Spain

City Toledo

Address: Av. de Irlanda, 21, 45005, Toledo

Network of private clinics, hospitals and specialized centers distributed throughout Spain.

Related internship programs: - Electrotherapy in Rehabilitation Medicine - Hair Transplantation

# 08 **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.



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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"

# tech 44 | 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.

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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.
- 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.



# tech 46 | Methodology

### **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 | 47 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.



# tech 48 | Methodology

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.

20%

15%

3%

15%

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.

# Methodology | 49 tech



#### **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.

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#### **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.



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.

# 09 **Certificate**

The Hybrid Professional Master's Degree in Update in Diagnostic and Therapeutic Techniques in Radiology guarantees students, in addition to the most rigorous and upto-date education, access to a Hybrid Professional Master's Degree diploma issued by TECH Technological University.



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Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork"

# tech 52 | Certificate

This Hybrid Professional Master's Degree in Update in Diagnostic and Therapeutic Techniques in Radiology contains the most complete and up-to-date program in the professional and academic landscape.

After the student has passed the evaluations, they will receive their corresponding TECH Hybrid Professional Master's Degree Diploma issued by TECH Technological University via tracked delivery.

In addition to the certificate, students will be able to obtain an academic transcript, as well as a certificate outlining the contents program. In order to do so, students, should contact their academic advisor, who will provide them with all the necessary information.

## Program: Hybrid Professional Master's Degree in Update in Diagnostic and Therapeutic Techniques in Radiology

Course Modality: Hybrid (Online + Clinical Internship)

Duration: **12 months.** 

Certificate: TECH Technological University

Teaching Hours: 1,620 h.



\*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.

# technological university Hybrid Professional Master's Degree

Update in Diagnostic and Therapeutic Techniques in Radiology

Course Modality: Hybrid (Online + Clinical Internship) Duration: 12 months. Certificate: TECH Technological University Teaching Hours: 1,620 hours. Hybrid Professional Master's Degree Update in Diagnostic and Therapeutic Techniques in Radiology

