Advanced Master's Degree

Nuclear Medicine and Radiodiagnostics

tech global university

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Advanced Master's Degree
Nuclear Medicine and Radiodiagnostics

- Modality: **online**
- Duration: **2 years**
- Certificate: **TECH Global University**
- Credits: **120 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: www.techtitute.com/us/medicine/advanced-master-degree/advanced-master-degree-nuclear-medicine-radiodiagnostics

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01

Introduction

The new diagnostic tools offered by disciplines such as nuclear medicine and radiology have brought about a revolution in the detection and monitoring of numerous pathologies. Thus, nowadays, there are advanced procedures that facilitate the work of the specialist, allowing them to perform daily with great precision. This program includes all these new features and offers them to the physician, who will be able to update his knowledge on issues such as gammagraphic studies and PET tracers in a comfortable and flexible way, since its online teaching system has been specifically designed for the practicing professional.

Incorporate the most advanced diagnostic methods and interventions into your daily practice thanks to this program, with which you will be able to deepen your knowledge of issues such as targeted therapy with radioligands"

The disciplines of radiology and Nuclear Medicine have undergone major transformations in recent years, allowing the specialist to incorporate surgical techniques and diagnostic methods of great precision. Thus, these fields are two of the most advanced in medicine today, so the professional who wishes to keep up to date has to take an update program like this Advanced Master's Degree in Nuclear Medicine and Radiodiagnosis.

This degree has been designed with the aim of offering physicians the most recent developments in these areas, so that they can integrate into their daily work the latest innovations in issues such as the treatment of cerebral vasospasm, the combined technique of BSGC and localization of occult lesion (SNOLL), teragnosis applied to neuroendocrine and gastroenteropancreatic tumors or breast cancer screening and the BI-RADS system, among many others.

All this, from a 100% online learning system that will adapt to the personal circumstances of the specialist, since they will be able to decide when, where and how to study, without having to submit to rigid schedules and without uncomfortable trips to an academic center. In addition, a teaching staff of great international prestige will accompany you throughout the entire process and will use numerous multimedia resources to make the program's educational itinerary more effective.

This **Advanced Master's Degree in Nuclear Medicine and Radiodiagnostics** contains the most complete and up-to-date scientific program on the market. The most important features include:

- Development of practical cases presented by experts in Nuclear Medicine and Radiodiagnostics
- The graphic, schematic, and eminently practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- Practical exercises where self-assessment can be used to improve learning
- Special emphasis on innovative methodologies in Nuclear Medicine and Radiodiagnostics
- 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

This program is developed in a 100% online format and will allow you to combine your work with your studies, without submitting to rigid schedules or requiring you to travel to an academic center"

Get updated thanks to the prestigious teaching staff selected by TECH, composed of working professionals who know all the latest developments in these specialized fields"

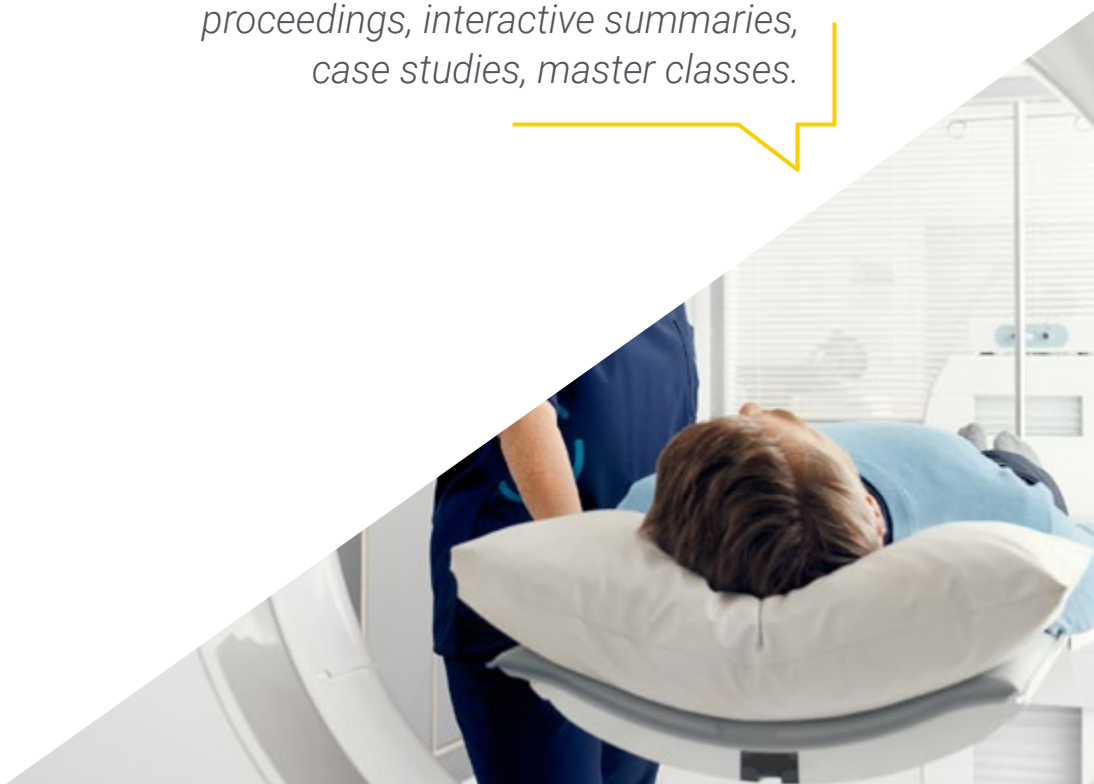
You will learn about the latest advances in Nuclear Medicine applied to pediatrics, deepening in PET/PET-CT/PET-MRI techniques in pediatric and young adult patients.

The best multimedia materials are waiting for you: Video proceedings, interactive summaries, case studies, master classes.

Its teaching staff includes professionals belonging to the field of medicine, who bring to this program the experience of their work, in addition to recognized specialists from prestigious reference societies and 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 an immersive training experience designed to train for real-life situations.

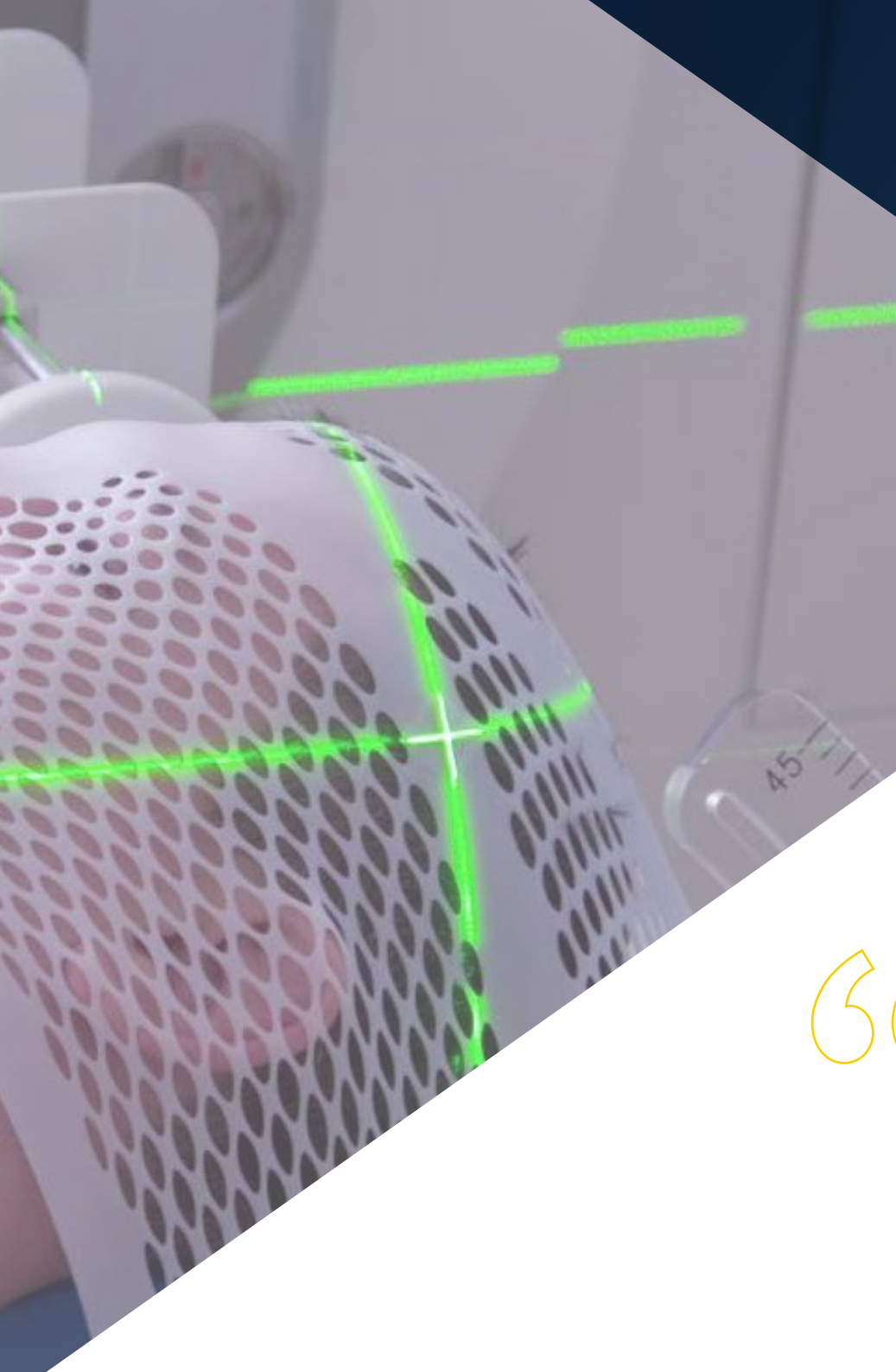
This program is designed around Problem-Based Learning, whereby the student must try to solve the different professional practice situations that arise during the academic year. For this purpose, the professional will be assisted by an innovative interactive video system created by renowned and experienced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



02

Objectives

The main objective of this Advanced Master's Degree in Nuclear Medicine and Radiodiagnostics is to provide the specialist with the latest advances in these disciplines. And to achieve this, it offers you the best option on the market: A teaching staff with a great international reputation in these medical areas, the most effective and flexible learning methodology and complete and updated contents, presented through different multimedia resources.



This program integrates the most advanced diagnostic methods of Nuclear Medicine and Radiodiagnosis, providing the specialist with comprehensive full-scale update in these areas"

General Objectives

- Update the specialist in Nuclear Medicine
- Perform and interpret functional tests in an integrated and sequential manner
- Achieve a diagnostic orientation of the patients
- Assist in deciding the best therapeutic strategy, including radiometabolic therapy, for each patient
- Apply clinical and biochemical criteria for the diagnosis of infections and inflammations
- Understand the particularities of Nuclear Medicine applied to pediatric patients
- Learn about the new therapies of Nuclear Medicine
- Know the latest contributions to radiological diagnosis and treatment which has a positive impact in curing and improving the quality of life of patients
- Increase the degree of knowledge in diagnostic and therapeutic radiology in the subspecialties of neurology, sensory organs, pneumology, cardiology, Gastroenterology, urology, traumatology, women's pathology and angiology
- Implement the protocols for medical management of the patient in diagnostic and therapeutic radiology
- Recognise the new materials used in interventional radiology

Specific Objectives

Module 1. Management

- Deepen the comprehensive management of the Nuclear Medicine unit with efficiency and quality oriented to the patient
- Establish a strategic plan considering the institution's environment, needs and resources
- Delve into the different organizational forms and the implementation of a quality program oriented to continuous improvement focused on the patient

Module 2. Radiomics

- Obtain diagnostic, response predictive and prognostic biomarkers offering patients personalized precision therapy

Module 3. Single Photon Emission Nuclear Medicine: "Pearls and Pitfalls"

- Show the characteristic imaging patterns for new pathologies, the causes of diagnostic error and the update of advances in conventional Nuclear Medicine in a practical way

Module 4. Infection/Inflammation: Gammagraphic Studies and PET Tracers

- Deepen in the application of molecular and morphofunctional imaging techniques in the field of Nuclear Medicine in the diagnosis, assessment of the extent and response to treatment of infectious/inflammatory pathology in the different organs and systems
- Deepen the techniques applied in the specific clinical context
- Accurate diagnosis with the least consumption of resources and radiation for the patient

Module 5. Nuclear Medicine in Pediatrics

- Deepen in the specific characteristics of Nuclear Medicine studies in pediatrics
- Cover aspects of test indication, acquisition protocols with appropriate choice of radiopharmaceutical and instrumentation characteristics
- Optimization of dosimetric parameters
- Interpret images and know the different pathologies by organs and systems and differential diagnosis
- Know the best diagnostic strategy with proper sequencing of tests while minimizing radiation
- Avoid tests that do not provide information for the management of the child

Module 6. Neuroendocrine Tumors

- Deepen the clinical, diagnostic and therapeutic aspects of NETs
- Position Nuclear Medicine both in the diagnostic and therapeutic aspects in the appropriate context

Module 7. Radioguided Surgery

- Establish the protocols for performing the techniques, as well as their indication and modifications in the management of the patient in the different localizations

Module 8. PET/CT- PET/MRI in Oncology Clinical Guidelines

- Deepen the role of PET/CT studies in tumors with the highest incidence
- Know its impact on diagnosis and staging and on response assessment and follow-up
- Analyze the positioning of the different scientific societies in the respective clinical guidelines

Module 9. Targeted Therapy with Radioligands

- Present the diagnostic protocols, patient selection, therapeutic protocols, care of the patient treated with metabolic therapy, responses obtained, side effects, its positioning compared to other therapies and possible lines of research for each of the different pathologies in which it is used

Module 10. Nuclear Medicine

- Deepen the knowledge of the basics of Nuclear Medicine in its fundamental elements, such as radioactivity and the type of disintegrations, image detection and generation, radiopharmaceuticals and radioprotection

Module 11. Neuroradiology

- Recognize radiological advances in cerebrovascular disease and protocolize the radiologist's actions in the code stroke in time
- Analyze the image findings in craniocerebral trauma
- Recognize the pathological signs of the hypothalamic-pituitary axis
- 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
- Recognise the latest advances in diagnostic neuroradiology

Module 12. Sensory Organs

- Analyze the findings of diagnostic radiology techniques in Ophthalmologic Pathology

Module 13. Chest

- Diagnose and stage lung cancer using radiological techniques
- Evaluate the response to lung cancer treatment
- Describe the radiological semiology of thoracic vascular pathology

Module 14. Abdomen

- Analyze the findings of radiological techniques in pelvic floor pathology

Module 15. Musculoskeletal System (MSK)

- Recognize injuries secondary to glenohumeral 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
- Recognise 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 16. Breast
- 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

Module 17. 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 18. Management in Radiology
- Describe the way in which to manage a radiology department
- 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

Module 19. Basis of Intervention Procedures
- Explain the technical bases for the development and performance of the different approaches in interventional procedures and the bases of advanced radiological protection

Module 20. Intervention Materials
- Describe the main characteristics of the various materials used in interventional radiology in all territories as well as the techniques with their indications, handling, problems and solutions

Module 21. Venous and Lymphatic Interventional Procedures
- Describe the techniques of venous and lymphatic interventionism, its indications, alternatives, and medical management
- Address the treatment of venous insufficiency of the lower limbs
- Describe abdominal aortography and arteriography, their indications, alternatives, and medical management

Module 22. Vascular Diagnosis
- Describe the arteriography of visceral digestive trunks, their indications, alternatives, and medical management

Module 23. Vascular Therapy
- Describe the techniques for vascular therapy, their indications, alternatives, and medical management

Module 24. Embolotherapy
- Manage the most advanced techniques in embolotherapy

Module 25. Diagnostic Punctures
- Perform percutaneous, renal, hepatic and pulmonary biopsies

Module 26. Diagnostic Neurointerventionism

- Describe cerebral and spinal arteriography, its indications, alternatives, and medical management

Module 27. Therapeutic Neurointerventionism

- Describe the techniques for therapeutic neurointerventionism, their indications, alternatives, and medical management
- Address the treatment of cerebral vasospasm, ischemic stroke and intracerebral AVMs
- Identify the spinal vascular malformations

Module 28. Musculoskeletal Interventionism

- Describe the techniques of musculoskeletal interventionism, its indications, alternatives, and medical management

Module 29. Urologic Interventionism

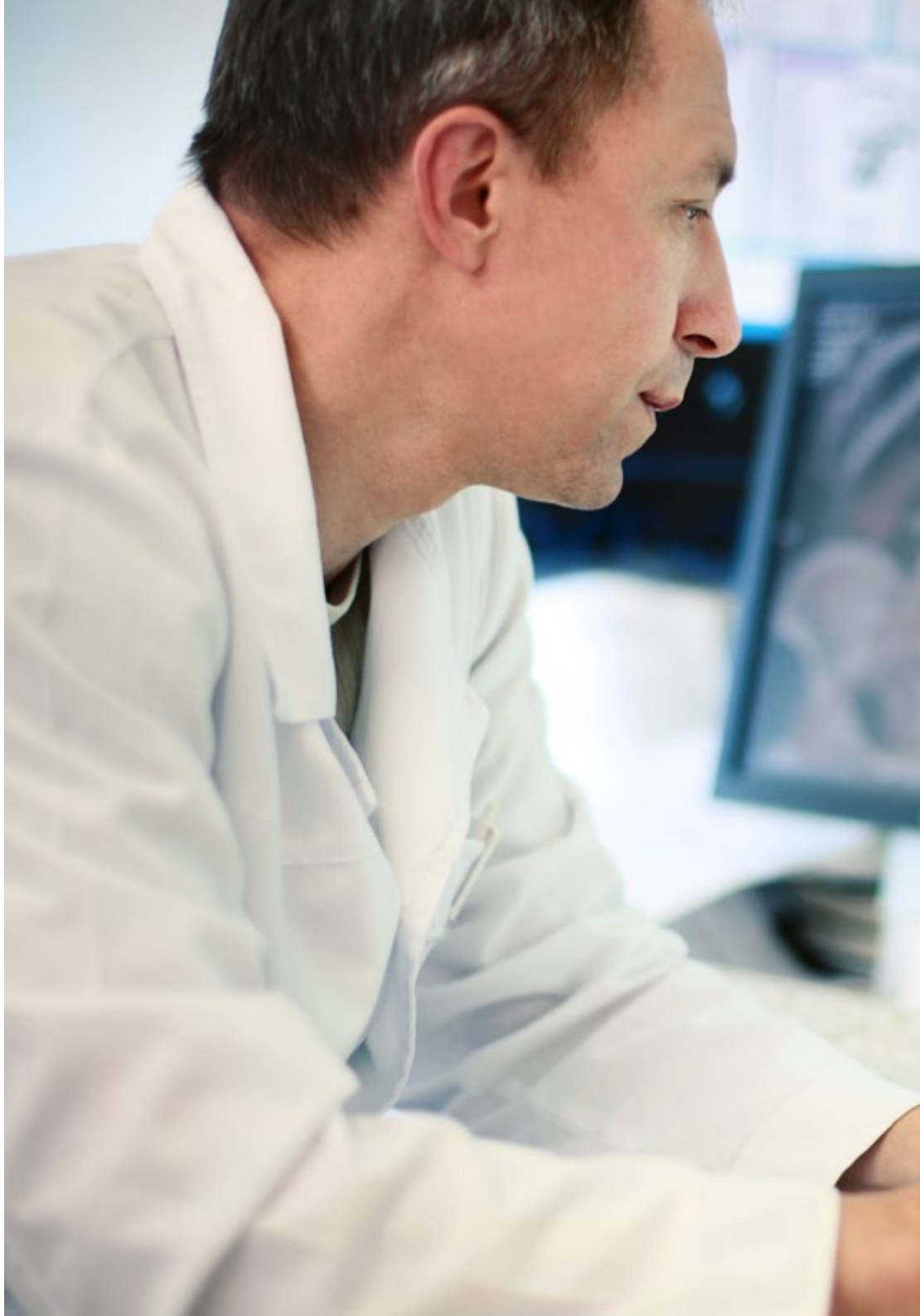
- Describe the techniques of urologic interventionism, its indications, alternatives, and medical management
- Recognize radiological surgery of urologic neoplasms
- Systematize the reading and radiologic report of prostate cancer with PI-RADS

Module 30. Thoracic Interventionism

- Describe thoracentesis, thoracic drainage and associated techniques, their indications, alternatives and medical management

Module 31. Puncture Drainage

- Identify the indications for biliary and abscess drainage, its approaches and technique
- Describe the techniques of percutaneous gastrojejunostomy, gastrostomy and cholecystostomy, and their medical management



Module 32. Ablative techniques

- Describe the ablative techniques, their indications, alternatives, and medical management
- Complete knowledge with some non-systematizable techniques and broaden the vision of Interventional Radiology with new horizons based on new biomaterials, techniques, post-processing and biomarkers in medical imaging

Module 33. Other Aspects of Interest in Interventional Radiology

- Describe the management models, indicators, development of strategic plans and organization in Interventional Radiology
- Determine the legislation of patient information, the use of informed consent and data protection
- Identify the main aspects and be capable of developing a clinical consultation in Radiology
- Identify and manage local anesthetics, pain management, sedation and anesthetic block techniques with ultrasound

Module 34. Management and Organization in Image-Guided Therapy

- Incorporate the protocols for medical management in diseases commonly managed in Interventional Radiology and Diagnostic Radiology
- Gain up-to-date knowledge of the architectural and technical requirements required for the implementation of an imageguided therapy service or section

03

Skills

Through this program, the specialist will be able to update their skills in aspects such as radiopharmaceuticals, imaging in Nuclear Medicine or the extraction of foreign bodies in the field of interventional radiology. Thus, the physician will have obtained the most advanced knowledge to face the many challenges that exist today when making diagnoses and applying treatments and interventions by means of Nuclear Medicine or radiology.

Update your skills in the exciting field of Nuclear Medicine thanks to this Advanced Master's Degree"

General Skills

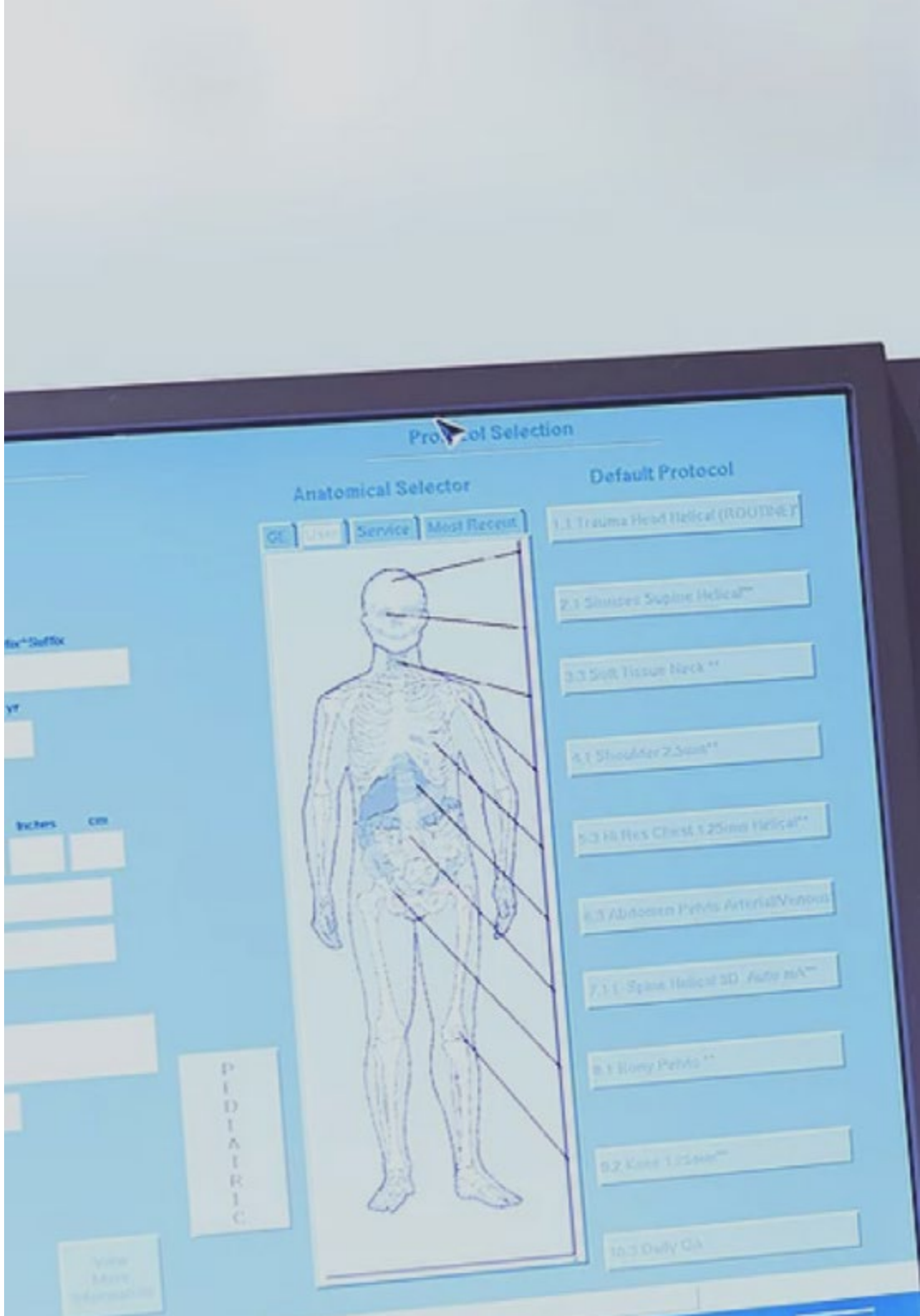
- Apply the most appropriate nuclear treatments, according to the pathology and circumstances of each patient
- Manage a Nuclear Medicine service
- Know the main advances in Nuclear Medicine in order to be able to respond appropriately to each situation
- Combine traditional nuclear medicine techniques with the latest advances in nuclear medicine
- Possess and understand knowledge that provides a basis or opportunity to be original in the development and/or application of ideas, often in a research context
- Know how to apply acquired knowledge and problem-solving skills in new or unfamiliar environments within broader (or multidisciplinary) contexts related to the area of study.
- Integrate knowledge and face the complexity of making judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities linked to the application of their knowledge and judgments
- Know how to communicate conclusions, knowledge, and supporting arguments to specialized and non-specialized audiences in a clear and unambiguous way
- Acquire the learning skills that will enable further studying in a largely self-directed or autonomous manner
- 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

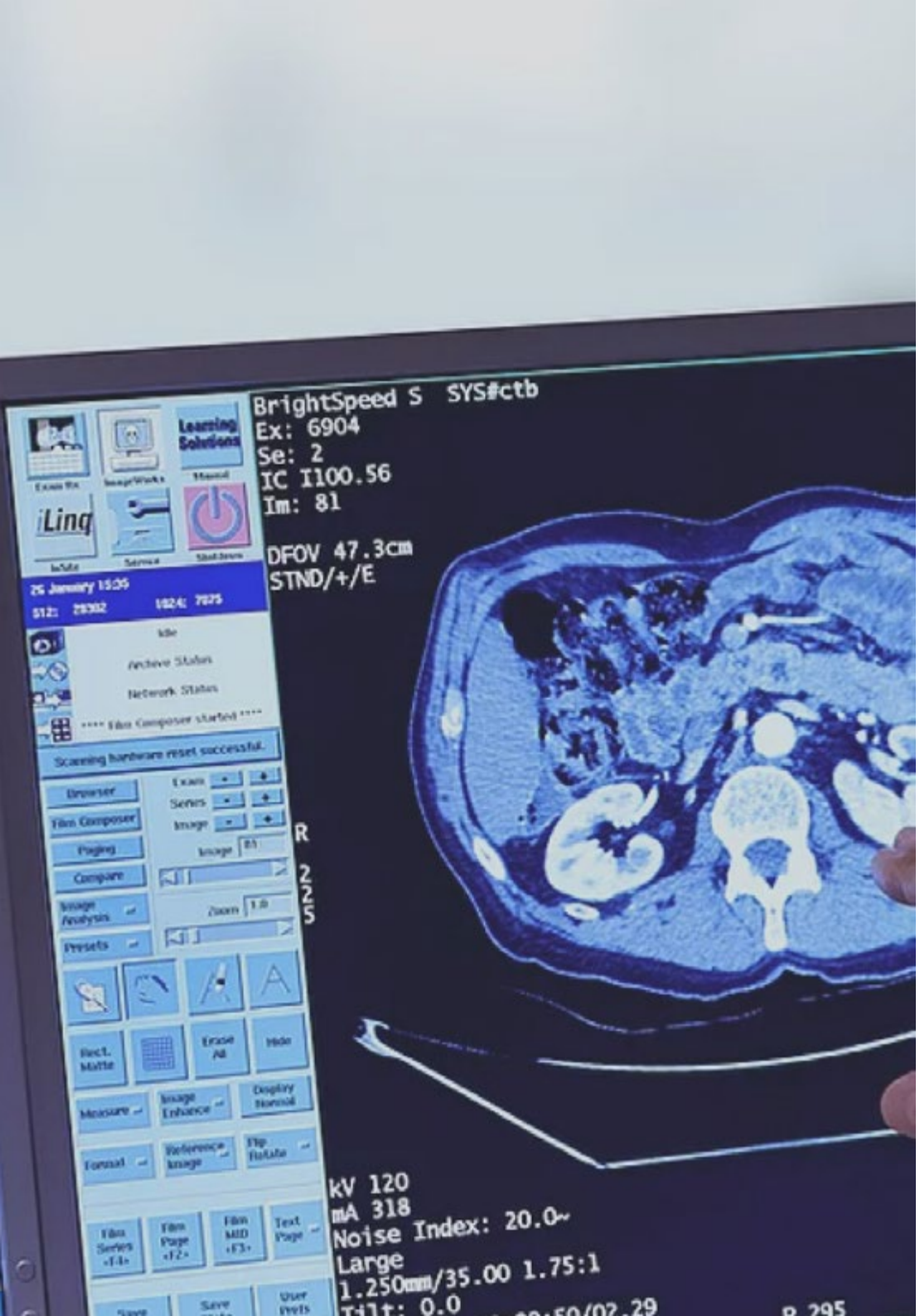
There is no other program as complete as this one that brings together the most advanced principles of radiology and Nuclear Medicine"

Specific Skills

- Optimize resources and offer quality assistance in a Nuclear Medicine service
- Efficiently and equitably manage all available resources in order to provide excellent quality care
- Master computational medical imaging using imaging biomarkers
- Learn about technological advances in conventional Nuclear Medicine, such as SEPECT/CT and new radiopharmaceuticals
- Manage molecular and morpho-functional imaging techniques in the field of Nuclear Medicine in diagnosis
- Apply Nuclear Medicine to the pediatric setting safely
- Treating neuroendocrine tumors with radiopharmaceuticals
- Perform radioguided surgeries applied to breast cancer
- Appropriate use of 18F-FDG PET/CT in different tumors
- Capture, accumulate and dispose of a chemical substance labeled with a radioactive isotope
- Identify the ICT advances involved in the radiology process
- Explain the importance of radiological information and the evolution towards a structured report
- Identify the medical-legal implications in radiological practice
- 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
- Protocolize in a timely manner the radiologist's actions in code stroke
- Describe radiological findings in cranioencephalic trauma, imaging biomarkers, phacomatosis, ophthalmologic pathology, pelvic floor pathology, disc and joint pathology of the spine and in benign pathology of the uterus and adnexa
- Assess the response to treatment of demyelinating diseases
- Identify infectious diseases with neuroaxis involvement
- Recognize the pathological signs of the hypothalamic-pituitary axis
- Explain the different evaluation systems for the response to treatment in CNS neoplasms
- Define and differentiate between treatment response, pseudoresponse, pseudoprogression and disease progression
- Identify the signs in different radiological techniques for use in nasosinusal pathology
- Radiologically stage pharyngeal and laryngeal neoplasms
- Identify the pathology affecting the airspace, mediastinum and pleura in radiology radiology
- Diagnose and stage lung cancer using radiological techniques
- Evaluate the response to lung cancer treatment
- Evaluate the anatomy and cardiac pathology with CT and MRI

- Use 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
- 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
- Manage a radiology department
- Systematize the reading and radiologic report of prostate cancer with PI-RADS
- Identify the changes produced by trauma pathology and spinal neoplasm
- Recognize injuries secondary to glenohumeral 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
- Recognise the different types of meniscus tears with MRI
- 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





- 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
- Stage the neoplasms of the uterus and cervix
- Analyze the technique and indications of dual-energy CT
- Apply the methodology of multiparametric studies in radiology
- Describe the management models, indicators, development of strategic plans and organization in Interventional Radiology
- Appropriately use informed consent and data protection
- Carry out a Radiology clinical consultation
- Manage local anesthetics, pain management and sedation and anesthetic block techniques with ultrasound
- 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 section
- Identify the materials used in interventional radiology, the indications, handling, problems and solutions
- Complete knowledge of the subject with some non-systematizable techniques and broaden the vision of Interventional Radiology based on new information

04

Course Management

Due to the enormous speed at which transformations are taking place in the areas of Nuclear Medicine and Radiodiagnosis, it is necessary to have the best specialists to know the current state of these disciplines. For this reason, TECH has selected a teaching staff of great international prestige to guide the physician throughout the learning process, guaranteeing direct and effective teaching, allowing them to apply all the new tools acquired in their work immediately.

The leading specialists in Nuclear Medicine and Radiodiagnosis will provide you with all the keys to these disciplines, making you an expert in all their advances"

Management

Dr. Mitjavila, Mercedes

- Head of the Nuclear Medicine Department. Puerta de Hierro University Hospital Majadahonda, Madrid
- Project Manager of the Nuclear Medicine Unit in the Diagnostic Imaging Department of the Hospital Universitario Fundación Alcorcón
- Head of the Nuclear Medicine Department of the Hospital Universitario Puerta de Hierro Majadahonda. Competitive examination BOCM
- Degree in Medicine and Surgery Generalities from the University of Alcalá de Henares
- MIR in Nuclear Medicine Specialist by the MIR System
- PhD in Medicine and Surgery Generalities from the University of Alcalá de Henares
- Medical Intern from of Nuclear Care Medicine Department at Ramón y Cajal Hospital
- Intern Physician in the Nuclear Medicine Unit at Getafe University Hospital

Professors

Dr. Cardona, Jorge

- Specialist physician in the Nuclear Medicine Department of the University Hospital. Responsible for the areas of Endocrinology, metabolic treatments, radioguided surgery, PET-CT in endocrinology (FDG, DOPA) and PET/CT in prostate cancer (Choline and PSMA)
- Degree in Medicine and Surgery. Complutense University of Madrid
- Diploma of Advanced Studies at the Complutense University of Madrid, obtained with the work "Use of intraoperative portable gamma camera in breast sentinel"
- Doctor of Medicine. Doctoral thesis at the Department of Radiology and Physical Medicine of the Complutense University of Madrid
- Professor of the Nuclear Medicine module at the Puerta de Hierro Specific Vocational Training Center
- Coordinator of the course "Clinical Sessions on Nuclear Medicine" at the Puerta de Hierro Hospital in Majadahonda

Dr. García Cañamaque, Lina

- Head of service at Sanchinarro Hospital
- Start-up of three Nuclear Medicine services (Hospital Nuestra Señora de América, Sanchinarro Hospital and Puerta del Sur Hospital)
- Specialist in Nuclear Medicine
- Official Doctoral Program in Pharmacy and Biomedicine. San Pablo CEU University
- Supervisor of 2nd category radioactive facilities. Nuclear Safety Council

Dr. Goñi Gironés, Elena

- Head of the Nuclear Medicine Department. Member of the Breast and Melanoma Unit of the Navarra Hospital Complex-CHN
- Area Specialist of the Nuclear Medicine Service of the Infanta Cristina Hospital in Badajoz, Spain
- Member of the Nuclear Medicine Quality Assurance Committee of the CHN
- Degree in Medicine and Surgery
- PhD from the Public University of Navarra
- Specialist in Nuclear Medicine
- Supervisor of Radiactive Installations

Mr. Herrera González, Antonio

- Data Analytics Manager (Big Data and Advanced Analytics Area)
- Director of Information Systems (IT) at General Hospital of Villalba
- Director of Information Systems at Rey Juan Carlos University Hospital
- Technical Engineering in Computer Systems. University of Salamanca.
- Master's Degree in Management of Health Information and Communication Systems and Technologies. Carlos III Health Institute
- Master's Degree in Big Data Analysis. MB European University of Madrid

Dr. Martí Climent, Josep M.

- Director of the Radiophysics and Radiological Protection Service of the Clínica Universidad de Navarra
- Deputy Director of the Nuclear Medicine Service at Navarra Clinical Univeristy
- Bachelor of Science (Universidad Autónoma de Barcelona)
- PhD in Sciences (Autonomous University of Barcelona)
- Specialist in Hospital Radiophysics (Ministry of Education and Science)

Dr. Mucientes, Jorge

- Nuclear Medicine Area Specialist at the Puerta de Hierro Majadahonda University Hospital
- Tutor of the Nuclear Medicine Residents at Puerta de Hierro University Hospital
- Quality Coordinator of the Nuclear Medicine Service of the Puerta de Hierro University Hospital
- Degree in Medicine and Surgery. University of Alcalá
- PhD in Medicine Cum Laude", Complutense University of Madrid

Dr. Muros de Fuentes, María Angustias

- Nuclear medicine in the Andalusian Health Service
- Degree in Medicine and Surgery. University of Granada
- Doctor of Medicine and Surgery. University of Granada
- Research: Galenic development and biodistribution study of the radiopharmaceutical99mtc-dextran for isotopic ventriculography studies
- Research: Utility of lymphoscintigraphy and BSGC in the treatment of thyroid cancer

Dr. Paniagua Correa, Cándida

- Medical Specialist in Nuclear Medicine with practice at Getafe Hospital
- Professional practice as a Nuclear Medicine Specialist in the Nuclear Medicine Department of the Hospital Universitario Quirón Madrid
- Collaborating professor in the training of residents in the specialty of Nuclear Medicine at the Hospital de Getafe
- Degree in Medicine and Surgery from the Complutense University
- Specialist in Nuclear Medicine. MIR at Getafe University Hospital
- Doctor in Dermatology Complutense University of Madrid
- Radioactive Facilities Supervisor License issued by the Nuclear Safety Council
- Member of Spanish Society of Nuclear Medicine

Dr. Rayo Madrid, Juan Ignacio

- Chief of the Nuclear Medicine Service of the University Hospital Complex of Badajoz
- Specialist in Nuclear Medicine and head of the Nuclear Medicine Service of the University Hospital Complex of Badajoz
- Area Specialist in Nuclear Medicine. Salamanca Clinical Hospital
- Degree in Medicine and Surgery. University of Extremadura
- PhD in Medicine and Surgery from the University of Salamanca. Outstanding Award
- Specialist in Nuclear Medicine. Salamanca Clinical Hospital
- Master's Degree in Quality Management in Health and Social Health Services. Complutense University of Madrid
- European Expert in Quality Management in the healthcare sector
- University Expert in Clinical Management

Dr. Rodríguez Alfonso, Begoña

- Elective Puerta de Hierro University Hospital
- Elective La Paz University Hospital
- Elective Ciudad Real General Hospital
- Degree in Medicine and Surgery University. Complutense of Madrid
- Official Doctoral Program in Surgery and Medicine. Autonomous University of Madrid

A high-level specialization created by an elite faculty"

05

Structure and Content

This Advanced Master's Degree in Nuclear Medicine and Radiodiagnostics has a structure of 34 specialized modules, through which the physician will be able to delve into the most recent innovations in aspects such as the management of neuroendocrine tumors using molecular techniques, radiopharmaceuticals for positron emission tomography, the treatment of intracerebral AVMs in radiology or selective internal radiation therapy (SIRT), among many others.

The most up-to-date contents in the application of Nuclear Medicine in the different tumors can be found in this program"

Module 1. Management

1.1. Strategic Planning
- 1.1.1. Benefits
- 1.1.2. Vision, Mission and Values of the Health Care Institution and the Nuclear Medicine Unit
- 1.1.3. Models: SWOT Analysis

1.2. Organization and Management
- 1.2.1. Organizational and Functional Structure
- 1.2.2. Technical Equipment
- 1.2.3. Human resources

1.3. Information Systems
- 1.3.1. Indicators and Indices

1.4. Knowledge Management

1.5. Quality Program
- 1.5.1. ISO Standard
- 1.5.2. Clinical Audits
- 1.5.3. Objectives of Clinical Audits
- 1.5.4. The Audit Cycle
- 1.5.5. Evidence Based Medicine
- 1.5.6. Elements of Quality: Structure, Process and Outcomes

1.6. Economic Evaluation of Nuclear Medicine Processes

1.7. Adequacy of Imaging Tests
- 1.7.1. What Should Be Done?
- 1.7.2. What Not to Do?

1.8. Risk Management
- 1.8.1. Levels of Responsibility
- 1.8.2. Patient Security.

1.9. Teleworking in Nuclear Medicine
- 1.9.1. Technical Needs
- 1.9.2. Legislation: Employment Relationship, Data Protection Act

Module 2. Radiomics

2.1. Artificial Intelligence, Machine Learning, Deep Learning

2.2. Radiomics Today

2.3. Imaging Biomarkers

2.4. Multidimensionality in the Image

2.5. Applications: Diagnosis, Prognosis and Prediction of Response

2.6. Evidence Levels

2.7. Combination with Other "Omics": Radiogenomics

Module 3. Single Photon Emission Nuclear Medicine: “pearls and pitfalls”

3.1. Pneumology
- 3.1.1. Perfusion/Ventilation
- 3.1.2. Pulmonary Thromboembolism
- 3.1.3. Pulmonary Hypertension
- 3.1.4. Lung Transplant
- 3.1.5. Pleuroperitoneal Fistula: Cirrhotic Patient, Peritoneal Dialysis

3.2. Cardiology
- 3.2.1. Perfusion: Ischemic Heart Disease, Cell Viability, Cell Contribution
- 3.2.2. GATED, Myocarditis
- 3.2.3. Shunt: Left-Right, Right-Left
- 3.2.4. Ventricular Function: Ischemic Heart Disease, Cardiotoxicity
- 3.2.5. Cardiac Innervation: Cardiac Pathology, Neurological Pathology

3.3. Vascular and Lymphatic System
- 3.3.1. Peripheral Endothelial Function
- 3.3.2. Lower Limb Perfusion
- 3.3.3. Lymphoscintigraphy

3.4. Osteoarticular
- 3.4.1. Primary Benign and Malignant Tumor Pathology: Planar Imaging
- 3.4.2. Hybrid Image Contribution
- 3.4.3. Bone Metastases: Contributions of SPECT and SPECT/CT, Usefulness in Diagnosis and Follow-up
- 3.4.4. Benign Pathology: Metabolic Disease, Sports Pathology

3.5. Nephrourology
- 3.5.1. Assessment of Renal Malformations
- 3.5.2. Obstructive Pathology: Hydronephrosis in Pediatric Age: Diagnosis and Follow-up, Adult Hydronephrosis, Study in Urinary Shunts
- 3.5.3. Pyelonephritis: Initial Diagnosis, Evolution
- 3.5.4. Renal Transplantation: Rejection, Tubular Necrosis, Nephrotixicity, Urinary Leakage
- 3.5.5. Vasculorenal Hypertension: Diagnosis and Follow-up
- 3.5.6. Glomerular Filtration and Effective Renal Plasma Flow
- 3.5.7. Cystogammagraphy: Direct and Indirect in the Diagnosis and Follow-Up of Vesicoureteral Reflux

3.6. Gastroenterology
- 3.6.1. Salivary Glands: Autoimmune Pathology, Post-radiation Damage, Salivary Gland Tumors
- 3.6.2. Digestive Transit: Esophageal Transit, Gastroesophageal Reflux, Pulmonary Aspiration, Gastric Emptying
- 3.6.3. Gastrointestinal Bleeding: Study with Labeled Red Blood Cells, Study with Radiocolloids
- 3.6.4. Hepatobiliary Pathology: Aliasic Cholecystitis, Hepatic Functional Reserve Assessment, Hepatic Transplantation (Rejection, Biliary Leakage), Biliary Tract Atresia
- 3.6.5. Bile Acid Malabsorption
- 3.6.6. Inflammatory Bowel Disease: Diagnosis, Follow-up and Complications
- 3.6.7. Hepatic Space-Occupying Lesion: Hepatic Hemangioma, Focal Nodular Hyperplasia Vs. Adenoma
- 3.6.8. Cell Labeling: Method and Indications
- 3.6.9. Red Blood Cells: In Vivo, In Vitro, In Vivitro
- 3.6.10. Leukocytes

3.7. Splenic Pathology
- 3.7.1. Space-Occupying Lesions: Hemangioma, Hamartoma
- 3.7.2. Splenosis: Study with Denatured Labeled Red Cells
- 3.7.3. Cellular Kidnapping

3.8. Endocrinology
- 3.8.1. Thyroid: Thyroid Hyperfunction (Autoimmune, Thyroiditis), Thyroid Nodule, Differentiated Thyroid Carcinoma
- 3.8.2. Parathyroid: Hyperfunctioning Gland Location
- 3.8.3. Adrenal Glands: Adrenal Cortex Pathology (Hypercortisolism, Hyperaldosteronism), Adrenal Medulla Pathology (Hyperplasia, Pheochromocytoma), Adrenal Incidental Adrenal Incidentaloma

3.9. Neurology SPECT Vs. PET:
- 3.9.1. Cognitive Impairment: Characteristic Patterns and Differential Diagnosis
- 3.9.2. Movement Disorders: Parkinson's Disease, Parkinson's Plus and Differential Diagnosis
- 3.9.3. Epilepsy: Pre-surgical Assessment, Acquisition Protocols

3.10. Oncology: Tumor Viability, Radionecrosis Vs. Progression
- 3.10.1. Brain Death
- 3.10.2. Cerebrospinal Fluid (CSF)-Cysternogammography Kinetics: Hydrocephalus, CSF Leakage

Module 4. Infection/Inflammation: Gammagraphic Studies and PET Tracers

4.1. Osteoarticular
- 4.1.1. Osteomyelitis: Previously Healthy Bone, Diabetic Patient, Spine Surgery
- 4.1.2. Prosthesis: Septic Mobilization Vs. Aseptic

4.2. Cardiac
- 4.2.1. Endocarditis - Native Valve, Prosthetic Valve
- 4.2.2. Myocarditis: Infectious Vs. Inflammatory
- 4.2.3. Intracardiac Devices

4.3. Vascular
- 4.3.1. Inflammatory Vasculitis
- 4.3.2. Prosthetic Graft Infection

4.4. Encephalitis: PET-FDG Study
- 4.4.1. Paraneoplastic
- 4.4.2. Infectious: Patterns and Differential Diagnosis

4.5. Fever of Unknown Origin
- 4.5.1. Immunosuppressed Patients
- 4.5.2. Postoperative Fever and Recurrent Sepsis

4.6. Systemic Disease
- 4.6.1. Sarcoidosis: Diagnosis, Extent and Response to Treatment
- 4.6.2. Ig4-Related Disease

4.7. Other Localizations
- 4.7.1. Hepatorenal Polycystic Kidney Disease: Localization of the Infectious Focus
- 4.7.2. Hepatobiliary: Post-surgical Patient

4.8. Covid-19
- 4.8.1. Nuclear Medicine Studies in Acute Phase: Pulmonary Inflammation, Pulmonary Thromboembolism, Oncology Patient and COVID-19
- 4.8.2. Utility of Nuclear Medicine in Post-covid Pathology: Pulmonary, Systemic
- 4.8.3. Organizational Changes in a Pandemic Situation

Module 5. Nuclear Medicine in Pediatrics

5.1. Pediatric MN
- 5.1.1. Management of the Child in Nuclear Medicine: Information to Parents and/or Guardians, Preparation and Scheduling, Appropriate Environments
- 5.1.2. Dose Optimization
- 5.1.3. Sedation and Anaesthesia
- 5.1.4. Physical Aspects in Pediatric Patients: Image Acquisition and Processing

5.2. PET/PET-CT/PET-MRI in Pediatric and Young Adult Patients
- 5.2.1. Protocol Optimization
- 5.2.2. Indications
- 5.2.3. Non-FDG Tracers

5.3. Central Nervous System/LCR
- 5.3.1. Brain Maturation Patterns
- 5.3.2. Epilepsy and Vascular Disorders
- 5.3.3. Brain Tumors
- 5.3.4. Hydrocephalus and Cerebrospinal Fluid Fistula

5.4. Endocrine
- 5.4.1. Thyroid Pathology: Hypothyroidism, Hyperthyroidism, Thyroid Nodule
- 5.4.2. Hyperinsulinism

5.5. Cardiopulmonary
- 5.5.1. Congenital Heart Disease: Right-to-Left Shunt , Left-to-Right Shunt
- 5.5.2. Bronchopulmonary Pathology: Congenital and Acquired

5.6. Gastrointestinal System
- 5.6.1. Dynamic Esophagogastric Studies
- 5.6.2. Gastroesophageal Reflux, Bronchopulmonary Aspiration
- 5.6.3. Hepatobiliary Scintigraphy: Biliary Tract Atresia
- 5.6.4. Intestinal Bleeding: Mekel's Diverticulum, Intestinal Duplication

5.7. Nephrourology
- 5.7.1. Hydronephrosis Evaluation
- 5.7.2. Renal Cortical Assessment: In Infections, Ectopias, etc
- 5.7.3. Vesicoureteral Reflux: Diagnosis and Follow-up
- 5.7.4. Others: Renal Malformations, Renal Transplantation, Kidney Transplantation

5.8. Osteoarticular System
- 5.8.1. Benign Lesions in Pediatric Patients: Fractures, Tumors, etc.
- 5.8.2. Avascular Necrosis: Perthes' Disease and Others
- 5.8.3. Sympathetic Reflex Sympathetic Dystrophy
- 5.8.4. Low Back Pain
- 5.8.5. Infection: Osteomyelitis, Spondylodiscitis

5.9. Neuroblastoma
- 5.9.1. Diagnostic Studies: Bone Scintigraphy, MIBG and Other PET Radiotracers
- 5.9.2. Radiometabolic Treatment: MIBG, 177Lu-DOTATATE

5.10. Other tumours
- 5.10.1. Osteosarcoma: Diagnosis, Response Assessment and Follow-Up
- 5.10.2. Bone Tracers and 18F-FDG-PET/CT PET/CT Study
- 5.10.3. Ewing's Disease: Diagnosis, Response Assessment and Follow-up
- 5.10.4. Bone Tracers and 18F-FDG-PET/TC Studies
- 5.10.5. Lymphoma: 18F-FDG PET/CT in Diagnosis, Response Assessment, Follow-up
- 5.10.6. Rhabdomyosarcoma and Soft Tissue Sarcoma: 18F-FDG PET/CT in Diagnosis, Response Assessment and Follow-up

Module 6. Neuroendocrine Tumors

6.1. Causes and Risk Factors
- 6.1.1. Hereditary Syndromes

6.2. Clinical Presentation
- 6.2.1. Signs
- 6.2.2. Symptoms: Endocrine Syndromes

6.3. Anatomopathological Diagnosis
- 6.3.1. Degrees of Cellular Differentiation
- 6.3.2. Classification

6.4. Subtypes and Localizations
- 6.4.1. Extrapancreatic
- 6.4.2. Pancreatic

6.5. Staging
- 6.5.1. Endoscopic Techniques
- 6.5.2. Imaging Techniques
- 6.5.3. Echo, CT, MRI

6.6. Molecular Techniques
- 6.6.1. 111In, 99mTc, 8Ga-Labeled Somatostatin Analogues
- 6.6.2. Advantages and Disadvantages of Each of Them Best Choice Based on Availability
- 6.6.3. 18F-FDG: Contributions to Patient Management
- 6.6.4. Combined FDG-Somatostatin Analogues Studies
- 6.6.5. Other Targets

6.7. Treatment
- 6.7.1. Available Treatments
- 6.7.2. Radiometabolic Therapy: When and How

6.8. Evaluation of Response to Treatment
- 6.8.1. Clinical - Biochemistry
- 6.8.2. Morphological
- 6.8.3. Functional Criteria

6.9. Monitoring
- 6.9.1. Clinical-Biochemistry
- 6.9.2. Image: Morphological and Functional The Best Sequence

6.10. Clinical Trials
- 6.10.1. Sequencing of Therapies
- 6.10.2. Association: Combined Treatments

Module 7. Radio-Guided Surgery

7.1. Sentinel Node Selective Biopsy (SNBGS)
- 7.1.1. Detection with Radiopharmaceuticals and Combined Techniques
  - 7.1.1.1. Radiocolloids, Dyes
  - 7.1.1.2. BSGC Breast Cancer
- 7.1.2. Initial Staging
- 7.1.3. In Neoadjuvant

7.2. BSGC Gynecological Tumors
- 7.2.1. Vulva
- 7.2.2. Cervix
- 7.2.3. Endometrium
- 7.2.4. Ovaries

7.3. BSGC Skin Cancer
- 7.3.1. Melanoma
- 7.3.2. Non-melanoma

7.4. BSGC Head and Neck Tumors
- 7.4.1. Thyroid Cancer
- 7.4.2. Oral Cavity

7.5. BSGC Gastrointestinal Tumors
- 7.5.1. Oesophageal Cancer
- 7.5.2. Stomach Cancer
- 7.5.3. Colorectal Carcinoma

7.6. BSGC Urological Cancers
- 7.6.1. Penis
- 7.6.2. Prostate

7.7. Combined Technique of BSGC and Occult Lesion Localization (SNOLL)
- 7.7.1. Breast
- 7.7.2. Other Localizations

7.8. ROLL
- 7.8.1. Radiopharmaceuticals 99mTc, Seeds 125-I
- 7.8.2. Indications: Tumor Pathology and Other Applications

7.9. Radio-Guided Surgery in Primary Hyperparathyroidism
- 7.9.1. Indications
- 7.9.2. Protocols According to Radiopharmaceuticals

Module 8. PET/CT- PET/MRI in Oncology Clinical Guidelines

8.1. Nuclear Medicine in Different Tumors
- 8.1.1. Staging and Prognosis
- 8.1.2. Response to Treatment
- 8.1.3. Follow-up and Diagnosis of Recurrence

8.2. Lymphomas
- 8.2.1. Hodgkin Lymphoma
- 8.2.2. Diffuse Large B-cell Lymphoma
- 8.2.3. Other Lymphomas

8.3. Breast Cancer
- 8.3.1. Initial Staging
- 8.3.2. Response to Neoadjuvant Therapy
- 8.3.3. Monitoring

8.4. Gynecological Tumors
- 8.4.1. Vagina Cervix: Staging, Response to Treatment and Follow-up
- 8.4.2. Endometrium: Staging, Response to Treatment and Follow-up
- 8.4.3. Ovary: Staging, Response to Treatment and Follow-up

8.5. Lung Cancer
- 8.5.1. Non-small Cell Carcinoma of the Lung
- 8.5.2. Small Cell Carcinoma of the Lung
- 8.5.3. Response Assessment: Radiation Therapy, Immunotherapy

8.6. Digestive Tumors
- 8.6.1. Esophago-Gastric
- 8.6.2. Colorectal
- 8.6.3. Pancreas
- 8.6.4. Hepatobiliary: Hepatocarcinoma, Cholangiocarcinoma

8.7. Sarcomas
- 8.7.1. Bone
- 8.7.2. Soft Parts

8.8. Urogenitals
- 8.8.1. Prostate
- 8.8.2. Renal
- 8.8.3. Bladder
- 8.8.4. Testicle

8.9. Endocrine
- 8.9.1. Thyroid
- 8.9.2. Adrenal

8.10. Radiotherapy Planning
- 8.10.1. Acquisition of Scanning
- 8.10.2. Volume Delimitation

Module 9. Targeted Therapy with Radioligands

9.1. Theragnosis
- 9.1.1. Clinical and Therapeutic Implications

9.2. Thyroid
- 9.2.1. Hyperthyroidism
- 9.2.2. Differentiated Thyroid Carcinoma
- 9.2.3. Goiter

9.3. Neuroendocrine, Gastroenteropancreatic and Other Tumors: Radiolabeled Peptides
- 9.3.1. Indications
- 9.3.2. Administration

9.4. Pheochromocytoma and Paragangliomas: 131I-MIBG
- 9.4.1. Indications and Patient Selection
- 9.4.2. Administration Protocols
- 9.4.3. Results

9.5. Bone Metastases
- 9.5.1. Pathophysiology of Bone Metastases
- 9.5.2. Basis of Radiometabolic Therapy
- 9.5.3. Radiopharmaceuticals Used: Indications and Results

9.6. Selective Internal Radiation Therapy (SIRT): Labeled Microspheres
- 9.6.1. Basis of Therapy with Radio-Labeled Microspheres
- 9.6.2. Available Devices: Differential Characteristics
- 9.6.3. Calculation of the Activity to Be Administered and Dosimetric Evaluation According to the Device
- 9.6.4. Hepatocarcinoma: Application and Results
- 9.6.5. Liver Metastases: Application and Results in Colorectal Carcinoma, Neuroendocrine and Other Tumors
- 9.6.6. Contributions of SIRT to Liver Surgery
- 9.6.7. Potentially Resectable Patient
- 9.6.8. Hepatic Lobe Hypertrophy

9.7. Synoviorthesis
- 9.7.1. Pathophysiological Basis of Treatment
- 9.7.2. Radiopharmaceuticals Used
- 9.7.3. Indications and Clinical Experience in Different Locations and Pathologies: Rheumatoid Arthritis, Other Arthritis, Vellonodular Synovitis
- 9.7.4. Applications in Pediatrics: Hemophilic Patient

9.8. Metastatic Prostate Cancer: 177Lu-PSMA
- 9.8.1. Pathophysiological Bases
- 9.8.2. Patient Selection
- 9.8.3. Management Protocols and Results

9.9. Lymphomas: Radioimmunotherapy
- 9.9.1. Pathophysiological Bases
- 9.9.2. Indications
- 9.9.3. Administration Protocols

9.10. Future
- 9.10.1. Search for New Ligands and Radioisotopes
- 9.10.2. Translational Research
- 9.10.3. Lines of Research

Module 10. Nuclear Medicine

10.1. Physical Bases of Ionizing Radiation
- 10.1.1. Ionizing Radiation and Radioactive Isotopes
- 10.1.2. Types of Radiation

10.2. Biological Effects of Ionizing Radiations
- 10.2.1. Classification of Effects According to: Time of Occurrence
- 10.2.2. Biological and Dose Dependent Effect
- 10.2.3. Interaction of Ionizing Radiation with Matter
- 10.2.4. Ionizing Radiation-Cell Interaction: Characteristics, Direct and Non-direct Effects
- 10.2.5. Radiosensitivity
- 10.2.6. Adaptive Response

10.3. Radiopharmaceuticals
- 10.3.1. The Radiopharmaceutical
- 10.3.2. Conventional Diagnostic Radiopharmaceuticals
- 10.3.3. Radionuclide Generators
- 10.3.4. Localization Mechanisms
- 10.3.5. Positron Emission Tomography Radiopharmaceuticals
- 10.3.6. Synthesis Scheme
- 10.3.7. Metabolic Pathway Substrates
- 10.3.8. Radiopharmaceuticals with Therapeutic Effect
  - 10.3.8.1. Characteristics that Must Be Met
  - 10.3.8.2. Design and Approval

10.4. Radiopharmacy
- 10.4.1. Regulatory Framework
- 10.4.2. Operation
- 10.4.3. Quality Control

10.5. Image Acquisition and Processing
- 10.5.1. Planar Image
- 10.5.2. Components
- 10.5.3. Performance: Resolution and Sensitivity
- 10.5.4. Acquisition Modes: Static, Dynamic, Synchronized
- 10.5.5. Reconstruction
- 10.5.6. Single Photon Tomography (SPECT)
- 10.5.7. Acquisition
- 10.5.8. Reconstruction
- 10.5.9. Positron Emission Tomography (PET)
- 10.5.10. Components
- 10.5.11. Data Acquisition
- 10.5.12. Operating Parameters

10.6. Quantification Techniques: Basis
- 10.6.1. In Cardiology
- 10.6.2. In Neurology
- 10.6.3. Metabolic Parameters
- 10.6.4. The Image of TC

10.7. Image Generation
- 10.7.1. Acquisition and Reconstruction Parameters
- 10.7.2. Protocols and Contrast Media
- 10.7.3. Head and Neck
- 10.7.4. Chest: Cardiology, Pulmonary
- 10.7.5. Abdomen: General, Liver, Renal

10.8. The Image of RM
- 10.8.1. Resonance Phenomenon
- 10.8.2. Tissue Contrast: Sequence Knowledge
- 10.8.3. Diffusion
- 10.8.4. Paramagnetic Contrasts

10.9. The Multimodality Image
- 10.9.1. SPECT/TC
- 10.9.2. PET/TC
- 10.9.3. PET/RM

10.10. Radioprotection
- 10.10.1. Radioprotection
- 10.10.2. Special situations: Pediatric, Pregnancy and Lactation
- 10.10.3. Regulatory Framework: Implementation
- 10.10.4. Dosimetry

Module 11. Neuroradiology

11.1. Cerebrovascular Disease
11.2. TBI.
11.3. Demyelinating Diseases
11.4. Dementia and Neurodegenerative Diseases
11.5. Basic Aspects of Cerebral Malformations. Hydrocephalus
11.6. Infections
11.7. Study of the Pituitary Gland
11.8. Spinal Cord Injuries
11.9. Central Nervous System Tumors
11.10. Monitoring and Assessment in Response to Supratentorial CNS Tumors
11.11. Advanced Techniques in Neuroradiology (Diffusion, Perfusion, Spectroscopy)

Module 12. Sensory Organs

12.1. Ophthalmologic Pathology
12.2. Study of the Base of the Skull
12.3. Naso-Sinus Pathology
12.4. Neoplasms of the Oral Cavity, Larynx and Pharynx (ORL)

Module 13. Chest

13.1. Airspace Pathology
13.2. Pleural Pathology
13.3. ILD (Diffuse Interstitial Lung Diseases)
13.4. COPD (Acute Chronic Obstructive Pulmonary Disease)
13.5. Infections
13.6. Lung Cancer
    13.6.1. Diagnosis and Staging
    13.6.2. Monitoring and Response Assessment
13.7. Mediastinal Tumors
13.8. Vascular Pathology
13.9. Thoracic Trauma
13.10. Heart
    13.10.1. Cardiac CT
    13.10.2. Cardiac MRI
    13.10.3. Management of Ischemic Heart Disease
    13.10.4. Myocardiopathies
    13.10.5. Valvulopathies
    13.10.6. Congenital Diseases
    13.10.7. Tumours

Module 14. Abdomen

14.1. Iodinated, Gadolinium (Gd)-based and Enteral Contrast Agents
14.2. Liver
    14.2.1. Focal Liver Lesion
    14.2.2. Diffuse Liver Disease
    14.2.3. Management of Cirrhosis Liver
    14.2.4. Study and Pathology of the Biliary Route
14.3. Pancreas.
    14.3.1. Pancreatitis
    14.3.2. Pancreatic Cancer
14.4. Splenic Lesions
14.5. Inflammatory Bowel Disease
14.6. Peritoneal Carcinomatosis
14.7. Staging and Response Assessment in Rectal Cancer
14.8. Technique and Indications of CT Colonoscopy
14.9. Defecography: Technique and Indications
14.10. Urology
    14.10.1. Renal, Ureteral and Bladder Cancer
    14.10.2. Multiparametric Study of Prostate Cancer. PI-RADS
    14.10.3. Testicular Cancer

Module 15. Musculoskeletal System (MSK)

15.1. Rotator Cuff Pathology
15.2. Glenohumeral Instability
15.3. Degenerative Wrist Pathology
15.4. Degenerative Wrist Trauma
15.5. Degenerative Spine Pathology
15.6. Meniscal Pathology
15.7. Knee Ligament Pathology
15.8. Cartilage and Knee Arthropathy
15.9. Ankle Trauma Lesions
15.10. Muscle-Tendinous Injuries

Module 16. Breast

16.1. Advances in Breast Imaging Techniques
16.2. Breast Cancer Screening and Bi-RADS System
16.3. FNA and Breast BAG
16.4. Breast Cancer Staging
16.5. Monitoring and Response Assessment in Breast Cancer

Module 17. Gynecology

17.1. Radiology of the Benign Pathology of the Uterus and Adnexa
17.2. Staging in Uterine and Cervical Cancer
17.3. Imaging Techniques in Ovarian Cancer

Module 18. Management in Radiology

18.1. Radiology Services Management
18.2. PACS (Picture Archiving and Communications System). RIS (Radiological Information Systems). Teleradiology
18.3. Radiological Report
18.4. Medical-Legal Aspects in Radiology

Module 19. Basis of Intervention Procedures

19.1. Radiological Protection in Interventional Procedures
19.2. Arterial and Venous Puncture for Interventional Access Seldinger and Trocar Technique
19.3. Ultrasound Puncture for Vascular Access
19.4. Compression of Puncture Sites and Care

Module 20. Materials in Interventional Techniques

20.1. Materials in Neurointerventionism
20.2. Materials in Vascular Interventional Techniques
20.3. Materials in Oncologic Interventional Techniques
20.4. Materials in Musculoskeletal Interventional Techniques
20.5. Materials for Drainage and Non-vascular Interventional Procedures

Module 21. Venous and Lymphatic Interventional Procedures

21.1. Phlebography of the Upper and Lower Limbs. Cavography
21.2. Superior Vena Cava Syndrome
21.3. Pulmonary Embolism and Deep Vein Thrombosis
21.4. Central Roads, Port a Cath, PICS
21.5. Diagnostic and Therapeutic Lymphography
21.6. Inferior Vena Cava Filter Placement
21.7. Dialysis Catheter Placement, Replacement and Removal
21.8. Angioplasty and Thrombectomy of Vascular Access for Dialysis
21.9. Transjugular Liver Biopsy, Hepatic Hemodynamic Study and Hepatic Venous Sampling
21.10. Treatment of Venous Insufficiency in Lower Limbs

Module 22. Vascular Diagnosis

22.1. Abdominal Aortography and Arteriography of Lower Limbs
22.2. Arteriography of Visceral Digestive Trunks

Module 23. Vascular Therapy

23.1. Peripheral Vascular Angiopathy and Stents
23.2. Arterial Thrombolysis of Lower Limbs and Percutaneous Thrombectomy
23.3. Percutaneous Vascular Closures
23.4. ATP of Renal Arteries and Stent
23.5. ATP and Stenting of Visceral Digestive Trunks
23.6. Aneurysms in Visceral Arteries. Diagnosis and Treatment
23.7. Aortic Aneurysms. Endoprosthesis
23.8. Treatment of Diabetic Foot

Module 24. Embolotherapy

24.1. Upper and Lower Gastrointestinal Bleeding
24.2. Renal Embolization
24.3. Embolization in Trauma
24.4. Prostatic Embolization
24.5. Uterine Embolization
24.6. Portal Embolization
24.7. Hepatic Chemoembolization
24.8. Hepatic DEBIRI

Module 25. Diagnostic Punctures

25.1. Image-Guided Percutaneous Biopsy. FNA
25.2. Renal Biopsy
25.3. Hepatic Biopsy
25.4. Pulmonary Biopsy

Module 26. Diagnostic Neurointerventionism

26.1. Cerebral Arteriography
26.2. Spinal Arteriography
26.3. Petrosal Sinus Sampling
26.4. Wada Test

Module 27. Therapeutic Neurointerventionism

27.1. Embolization of Cerebral Aneurysms
27.2. Treatment of Cerebral Vasospasm
27.3. Carotid Stent, Vertebral Stent and Cerebral Stent
27.4. Endovascular Treatment of an Ischemic Stroke
27.5. Embolization in Epistaxis
27.6. Embolization of Cerebral Meningiomas and Paragangliomas
27.7. Treatment of Intracerebral AVMs
27.8. Dural Fistulas, Diagnosis and Treatment
27.9. Spinal Vascular Malformations

Module 28. Musculoskeletal Interventionism

28.1. Discography
28.2. Vertebroplasty, Vesselplasty and Kyphoplasty
28.3. Infiltration and Facet Rhizolysis
28.4. Percutaneous Discectomy
28.5. Epidurolisis and Pain Management
28.6. Percutaneous Ganglionic Block for Pain
28.7. Joint Infiltrations

Module 29. Urologic Interventionism

29.1. Percutaneous Nephrostomy
29.2. Anterograde Double J
29.3. Retrograde Double J and Endourological Interventionism
29.4. Ureteral and Urethral Endoprosthesis

Module 30. Thoracic Interventionism

30.1. Thoracentesis, Thoracic Drainage and Associated Techniques
30.2. Drainage of Thoracic Abscesses

Module 31. Puncture Drainage

31.1. Biliary Drainage
31.2. Drainage of Abscesses. Approaches and Technique
31.3. Percutaneous Gastrostomy and Gastrojejunostomy
31.4. Percutaneous Cholecystostomy

Module 32. Ablative techniques

32.1. Tumor Ablation with Radiofrequency and Microwaves
32.2. Tumor Cryoablation Irreversible Electroporation

Module 33. Other Aspects of Interest in Interventional Radiology

33.1. Extraction of Foreign Bodies
33.2. Multimodality Fusion
33.3. Nanoparticles. Future of Interventional Radiology

Module 34. Management and Organization in Image-Guided Therapy

34.1. Informed Consent in Interventional Radiology
34.2. The Outpatient Clinic and the Interventional Radiology Department
34.3. Anaesthesia in Interventional Radiology
  34.3.1. Local Anesthetics
  34.3.2. Sedation and Analgesia
  34.3.3. Nerve Blocker
34.4. Medical Management Protocols in General and Interventional Radiology
34.5. Medication Used in Neurointerventionism
34.6. Medication Used in Vascular and Non-Vascular Interventionism
34.7. Management in Interventional Radiology: RVUs, DRGs, Indicators
34.8. Intervention Rooms

Enjoy the most up-to-the-minute expertise in Nuclear Medicine and Radiodiagnostics presented in multimedia format by the leading specialists in these areas at international level"

06

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 achievements:

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.

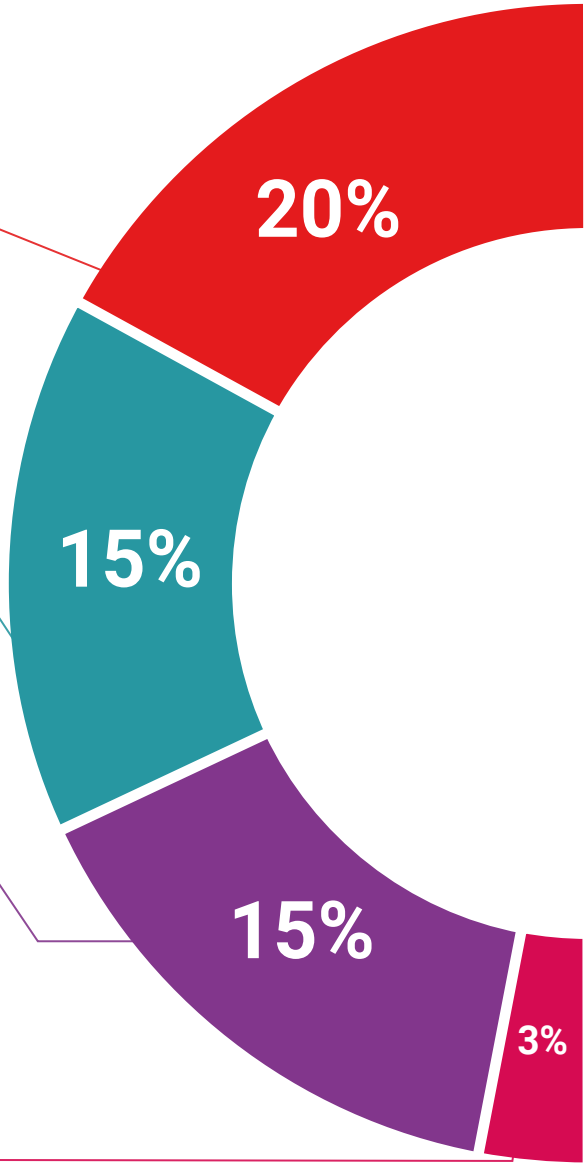
Interactive Summaries

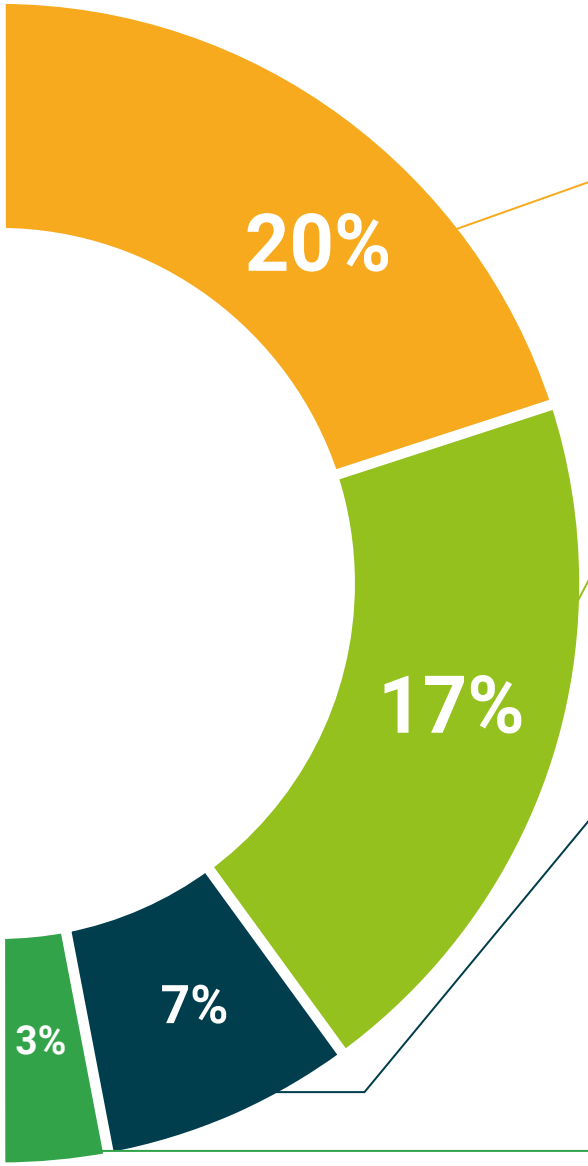
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This exclusive multimedia content presentation training Exclusive system 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 your goals.

Classes

There is scientific evidence on the usefulness of learning by observing experts: The system termed Learning from an Expert strengthens knowledge and recall capacity, and generates confidence in the face of difficult decisions in the future.

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.

07

Certificate

The Advanced Master's Degree in Nuclear Medicine and Radiodiagnostics guarantees you, in addition to the most rigorous and updated training, access to a Advanced Master's degree issued by TECH Global University.

Successfully complete this program and receive your university degree without travel or laborious paperwork"

This program will allow you to obtain your **Advanced Master's Degree diploma in Nuclear Medicine and Radiodiagnostics** 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: **Advanced Master's Degree in Nuclear Medicine and Radiodiagnostics**

Modality: **online**

Duration: **2 years**

Accreditation: **120 ECTS**


tech global university

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

Advanced Master's Degree in Nuclear Medicine and Radiodiagnostics

This is a program of 3,000 hours of duration equivalent to 120 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

Dr. Pedro Navarro Illana
Rector

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


Advanced Master's Degree in Nuclear Medicine and Radiodiagnostics

General Structure of the Syllabus

Year	Subject	ECTS	Type
1º	Management	3	CO
1º	Radiomics	3	CO
1º	Single Photon Emission Nuclear Medicine: "pearls and pitfalls"	3	CO
1º	Infection/Inflammation: Gammagraphic Studies and PET Tracers	3	CO
1º	Nuclear Medicine in Pediatrics	3	CO
1º	Neuroendocrine Tumors	3	CO
1º	Radio-Guided Surgery	3	CO
1º	PET/CT- PET/MRI in Oncology Clinical Guidelines	3	CO
1º	Targeted Therapy with Radioligands	3	CO
1º	Nuclear Medicine	3	CO
1º	Neuroradiology	3	CO
1º	Sensory Organs	3	CO
1º	Chest	3	CO
1º	Abdomen	3	CO
1º	Musculoskeletal System (MSK)	3	CO
1º	Breast	3	CO
1º	Gynecology	3	CO

Year	Subject	ECTS	Type
2º	Management in Radiology	3	CO
2º	Basis of Intervention Procedures	3	CO
2º	Materials in Interventional Techniques	3	CO
2º	Venous and Lymphatic Interventional Procedures	3	CO
2º	Vascular Diagnosis	3	CO
2º	Vascular Therapy	3	CO
2º	Embolotherapy	3	CO
2º	Diagnostic Punctures	3	CO
2º	Diagnostic Neurointerventionism	3	CO
2º	Therapeutic Neurointerventionism	3	CO
2º	Musculoskeletal Interventionism	3	CO
2º	Urologic Interventionism	3	CO
2º	Thoracic Interventionism	3	CO
2º	Puncture Drainage	6	CO
2º	Ablative techniques	6	CO
2º	Other Aspects of Interest in Interventional Radiology	6	CO
2º	Management and Organization in Image-Guided Therapy	6	CO

Dr. Pedro Navarro Illana
Rector

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*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH Global University will make the necessary arrangements to obtain it, at an additional cost.

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Advanced Master's Degree
Nuclear Medicine and Radiodiagnostics

- Modality: **online**
- Duration: **2 years**
- Certificate: **TECH Global University**
- Credits: **120 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Advanced Master's Degree

Nuclear Medicine and Radiodiagnostics

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