

# Professional Master's Degree Radiological Nursing





## Professional Master's Degree Radiological Nursing

- » Modality: online
- » Duration: 12 months
- » Certificate: TECH Global University
- » Credits: 60 ECTS
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtitute.com/us/nursing/professional-master-degree/master-radiological-nursing](http://www.techtitute.com/us/nursing/professional-master-degree/master-radiological-nursing)

# Index

01

Introduction

---

*p. 4*

02

Objectives

---

*p. 8*

03

Skills

---

*p. 14*

04

Course Management

---

*p. 18*

05

Structure and Content

---

*p. 22*

06

Methodology

---

*p. 36*

07

Certificate

---

*p. 44*

# 01

# Introduction

The continuous advances in the field of Radiology, thanks to technology and the improvement of techniques, have allowed the development of minimally invasive therapies and to carry out much more effective and safe procedures. In this way, the area of Diagnostic Imaging and Treatment has undergone in recent years a great boost, requiring professionals aware of the latest developments. For this reason, TECH provides the graduates with a complete update in this field, through a 100% online syllabus and prepared by experienced health professionals in DTI, MN and OR units. Thus, students will achieve, with maximum guarantees, to be aware of the care and action procedures developed by Radiological Nursing.



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*Thanks to this 12-month Professional Master's Degree with the most current syllabus on Radiological Nursing”*

Technological evolution has brought with it important achievements in Radiology and with it in the detection of diseases through much more precise images. All this, in addition to much more effective and safer procedures for both the patient and the nursing professional, in charge of administering drugs or facilitating the performance of tests.

In this sense, the role of healthcare professionals is essential, so it is necessary that they are aware of the latest advances in imaging techniques, in the protocols of action, thus improving the coloration with the medical professional in making appropriate decisions. Faced with this reality, TECH has designed this 100% online university program that takes students over 12 months to make a complete update in Radiological Nursing.

A Professional Master's Degree that is distinguished by having an advanced agenda ranging from care management and organization of the Area of Diagnostic Imaging and Treatment, the DTI Service, to the most notorious advances in Computed Tomography, Magnetic Resonance Imaging or Radiation Oncology, among others.

All this, in addition, with first class teaching material based on video summaries of each topic, videos in detail, specialized readings and clinical case studies, which make up a vast library of resources to which the graduate will have access 24 hours a day, from any digital device with Internet connection.

In addition, this updating process will be much simpler and more effective thanks to the Relearning method, based on the continuous reiteration of key concepts throughout the academic itinerary. In this way, the graduates will be able to reduce the long hours of study and consolidate the most important concepts covered in this program.

Undoubtedly, a university proposal that responds to the real needs of updating nursing professionals through a flexible and convenient qualification. And the fact is that, with no classroom attendance or classes with fixed schedules, the graduates have greater freedom to self-manage their study time and reconcile it with their daily personal activities.

This **Professional Master's Degree in Radiological Nursing** contains the most complete and up-to-date scientific program on the market. The most important features include:

- ♦ The development of case studies presented by experts in Nursing in the area of Diagnostic and Imaging Treatment
- ♦ Graphic, schematic, and 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
- ♦ Its special emphasis on innovative methodologies
- ♦ Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- ♦ Content that is accessible from any fixed or portable device with an Internet connection



*You will be aware of the procedures performed in the Breast and Brachytherapy Unit from patients in consultation to those referred to the operating room after the placement of a harpoon”*

“*You are looking at a university program that fits your schedule and your motivation to update your skills in Radiological Nursing*”

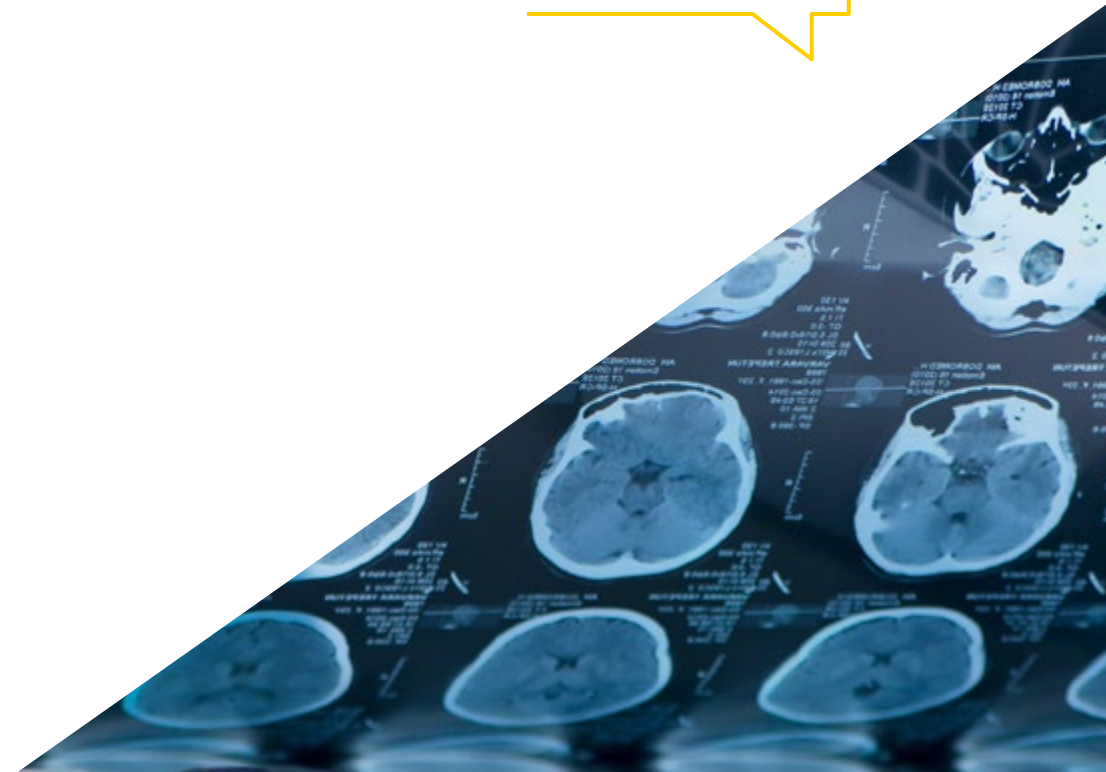
*Get a complete update on the administration of radiopharmaceuticals and the techniques used to administer them depending on the study procedure.*

*Delve whenever and wherever you want into complex contrast screening, adverse reactions to contrast administration, allergies and imaging test management.*

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

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

The design of this program focuses on Problem-Based Learning, by means of which the professionals must try to solve the different professional practice situations that are presented throughout the academic course. For this purpose, the students will be assisted by an innovative interactive video system created by renowned experts.



# 02

# Objectives

One of the emerging areas of Nursing is the Care Service in Diagnostic Imaging and Treatment Areas. For this reason, this program responds to the needs of updating the healthcare professionals in this field, facilitating their daily performance both in the ADTI and in the services that integrate it. To achieve these goals, the graduates will have pedagogical tools based on the latest technology applied to academics and a syllabus prepared by professionals with extensive experience in the healthcare field.





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*You will be aware of the most effective protocols in Interventional Vascular Radiology and Neuroradiology nursing care”*



## General Objectives

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- ◆ Promote work strategies based on the practical knowledge of a tertiary level hospital and its application in Diagnostic Imaging, Nuclear Medicine and Radiation Oncology services
- ◆ Favor the enhancement of technical skills and abilities through care procedures and case studies
- ◆ Provide nurses with a process of updating their knowledge in the field of Radiology
- ◆ Be up to date with the care management and organization of the Diagnostic Imaging and Treatment Area, in order to optimize the operation of the Radiology Service
- ◆ Develop skills and competencies in nurses for their performance in the nursing consultation in the Diagnostic Imaging and Treatment Department (DTI)
- ◆ Expand nurses' knowledge of radiation oncology, interventional vascular radiology and neuroradiology to improve patient care in these specific areas
- ◆ Develop nurses' skills in performing image-guided procedures, including breast and brachytherapy, to improve the quality of patient care and optimize clinical outcomes



*A complete update of knowledge in Radiological Nursing with 1,500 teaching hours of the highest academic level"*





## Specific Objectives

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### Module 1. Radiological Nursing Care management and organization of the Diagnostic Imaging and Diagnostic Treatment Area

- ♦ Deepen in the organization of the Diagnostic Imaging and Treatment Area, its history, legislation, regulations and health equipment
- ♦ Update knowledge of the radiological nurse's scope of action within an organizational structure and its portfolio of services
- ♦ Deepen knowledge in undergraduate and postgraduate training in Radiological Nursing
- ♦ Deepen the work of supervising nursing and technical staff, as well as the control of equipment and facilities
- ♦ Describe the environmental and financial sustainability implemented and the challenge it represents
- ♦ Value the importance of health humanization implemented in the Diagnostic and Imaging Treatment Area

### Module 2. Nursing in the Diagnostic Imaging and Treatment Service (DTI). Nursing Consultation

- ♦ Deepen in the competences to be developed by the nurse in the consultation
- ♦ Deepen in the management of the prevention of unwanted effects after contrast administration, both in allergic patients and in patients with renal insufficiency
- ♦ Establish priorities in the different management activities
- ♦ Delve into the recommendations of the evaluating physicians of the diagnostic tests and to communicate them if necessary to whom it is necessary, managing an agenda of case managers and secretaries, as well as general practitioners

### Module 3. Computerized Tomography

- ♦ Discover the history, physical fundamentals, elements and components involved in CT imaging
- ♦ Delve into the objectives of the scan: muscle and bone disorders, bone tumors and fractures; localization of tumors, infections and blood clots
- ♦ Describe the applications of the procedures in early detection, disease monitoring, treatment effectiveness and detection of injuries
- ♦ Deepen in the risks of the explorations: exposure to radiation, reactions to contrast material and those derived from sedation
- ♦ Develop the necessary competences to elaborate the nursing care process for patients undergoing a CT examination

### Module 4. Magnetic Resonance

- ♦ Deepen in the history, physical fundamentals, elements and components involved in MR imaging
- ♦ Delve into the objectives of the diagnostic exploration: Central Nervous System studies, abdominal and gynecological diagnostic studies, breast and pulmonary angiography studies, musculoskeletal lesion studies and cardiac diagnostic studies
- ♦ Deepen in the risks of the explorations: metal objects, reactions to contrast material and those derived from sedation
- ♦ Develop the necessary competences to elaborate the nursing care process for patients attended in Magnetic Resonance Imaging

### **Module 5. Nuclear Medicine I**

- ♦ Describe the object of Nuclear Medicine, its physical and chemical fundamentals
- ♦ Update knowledge in the handling of radiopharmaceuticals
- ♦ Delve into the radioprotection norms appropriate to each radiopharmaceutical and to train us to carry out health education in their application in the intra and intra-hospital environment
- ♦ Carry out a correct management of radioactive waste
- ♦ Develop nursing skills in techniques derived from metabolic therapies
- ♦ Deepen on the studies performed in PET and the role of the nurse in the care of patients undergoing this test
- ♦ Delve into the different techniques of medical diagnostic imaging in MN
- ♦ Define the characteristics of radioactive decay, types of radiation, its interaction with the environment and the consequences of clinical interest
- ♦ Delve into the structure of a generator
- ♦ Differentiate the concepts of radiopharmaceutical, radiotracer and radionuclide
- ♦ Describe the general characteristics of radionuclides
- ♦ Develop what an activimeter is used for and how it works
- ♦ Identify the different elements of a gamma camera
- ♦ Describe the basics of scintigraphic imaging
- ♦ Evaluate the advantages and disadvantages of scintigraphy
- ♦ Identify the main therapeutic applications of some radioisotopes
- ♦ Describe the characteristics and kinetics of radiopharmaceuticals associated with each diagnostic examination

### **Module 6. Nuclear Medicine II Isotopic Studies**

- ♦ Deepen in the development of the studies performed in the Nuclear Medicine Department and the use of the gamma camera
- ♦ Delve into the different nursing procedures of isotopic studies in neurology, pneumology, nephrourology, cardiology, vascular, musculoskeletal, hepatic, biliary, etc
- ♦ Implement the nursing care process for patients undergoing Gammacamera studies
- ♦ Manage the different radiological protection recommendations and their correct explanation to patients and health personnel outside the MN service

### **Module 7. Radiation Oncology**

- ♦ Discover what is Radiation Oncology and its uses
- ♦ Deepen in the human capital and the necessary material of this Service
- ♦ Describe the applications of the radiotherapeutic process
- ♦ Implement the nursing care process in the different interventions carried out in the department

### **Module 8. Vascular Interventional Radiology and Neuroradiology Nursing**

- ♦ Delve into the history of interventional radiology, the role of the nurse and the requirements of the vascular and neuroradiology operating room
- ♦ Deepen in the concepts of radioprotection and the specific rules of the interventional operating room
- ♦ Describe the human and material equipment and its specific characteristics
- ♦ List the care derived from anesthesia assistance, as well as life-threatening situations and how to be prepared to respond to them with previous training
- ♦ Update knowledge on all non-vascular procedures, diagnostic and therapeutic vascular procedures, diagnostic and therapeutic neuroradiological procedures currently performed in a tertiary hospital and the nursing care process in each of them



### Module 9. Breast and Brachytherapy

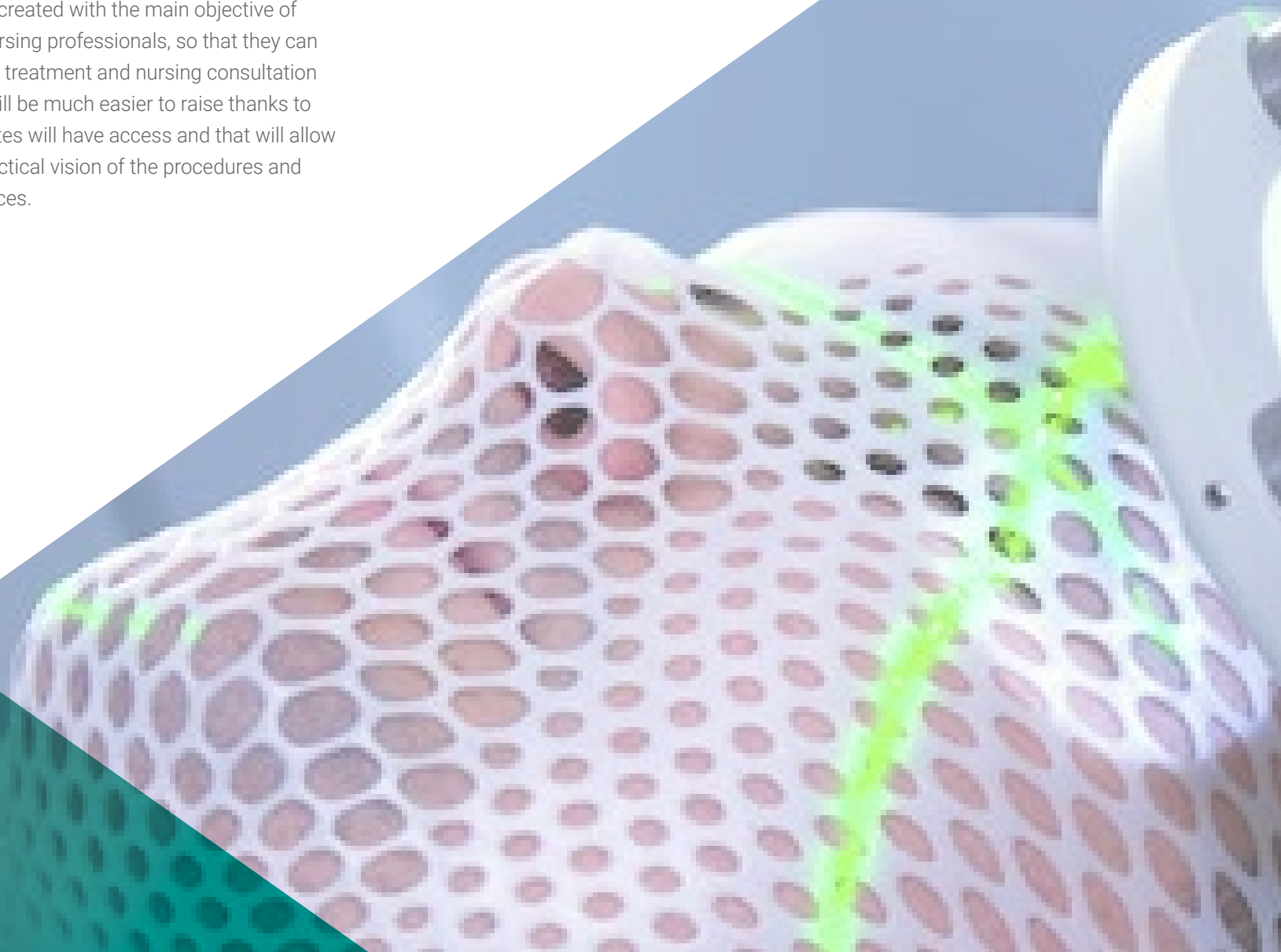
- ◆ Describe the evolution of diagnostic equipment in breast pathology imaging units
- ◆ Delve into the current working procedures, ultrasound-guided and mammography-guided diagnostic procedures, as well as specimen collection
- ◆ Deepen the role of the nurse on the wards
- ◆ Develop the nursing care process in the different interventions performed in the breast unit (BAG, FNA, Stereotaxy, Cryoablation and breast marking by seeds or scout)
- ◆ Update our knowledge on radioactive sources used in Brachytherapy
- ◆ List and deepen the treatments developed in benign and malignant pathology: LDR and HDR/ATD
- ◆ Implement the nursing care process in the different interventions carried out in the Brachytherapy unit

### Module 10. Other Image-Guided Procedures

- ◆ Discover ultrasound-guided interventionism, as well as the nursing procedures performed
- ◆ Update knowledge on the radiological techniques developed in Telemando
- ◆ Deepen in depth the Optical Coherence Tomography
- ◆ Delve into X-ray absorptiometry, its indication, preparation, results and benefits
- ◆ Value the importance of imaging in hemodynamics
- ◆ Be up to date in the different nursing techniques that are performed with ultrasound: catheterization, vascular access, etc
- ◆ Describe what a Cholangiopancreatography is and the role of imaging in the development of lithotripsy
- ◆ Delve into the archiving tools widely used nowadays in imaging services, PACs, image archiving and communication systems

# 03 Skills

This Professional Master's Degree has been created with the main objective of enhancing the competencies and skills of nursing professionals, so that they can perform with full guarantee in the diagnostic, treatment and nursing consultation rooms that make up the ADTI. These skills will be much easier to raise thanks to the clinical case studies to which the graduates will have access and that will allow them to obtain a much closer theoretical-practical vision of the procedures and methodologies used in these healthcare spaces.



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*The case studies will allow you to gain a much more practical insight into Radiology Nursing Care procedures”*



## General Skills

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- ◆ Emphasize the importance of Radiological Nursing in the diagnosis and treatment of diseases
- ◆ Develop skills for care management and organization of the Diagnostic Imaging and Treatment Area
- ◆ Apply the knowledge acquired in the Nursing module in the Diagnostic and Imaging Treatment Service (DTI) in the nursing office
- ◆ Apply Computed Tomography techniques
- ◆ Apply the latest techniques of Magnetic Resonance Imaging
- ◆ Apply the fundamentals of Nuclear Medicine in daily practice
- ◆ Use isotopic studies in clinical practice
- ◆ Develop nursing skills in Interventional Vascular Radiology and Neuroradiology
- ◆ Perfect the use of Breast and Brachytherapy techniques and their application in clinical practice
- ◆ Perform image-guided procedures and their application in clinical practice



*Elevate your skills for the performance of care and final assessment of patients who must undergo MRI*







## Specific Skills

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- ◆ Perform nursing procedures in the diagnostic imaging and treatment area in a safe and effective manner
- ◆ Manage and organize the diagnostic imaging and treatment area to ensure quality patient care
- ◆ Perform an appropriate nursing assessment in the diagnostic and imaging service and establish an individualized care plan for each patient
- ◆ Perform and interpret computed tomography and magnetic resonance imaging exams in a competent manner
- ◆ Master the basic principles of nuclear medicine and perform isotopic studies in a safe and effective manner
- ◆ Administer radiotherapeutic treatments safely and effectively in oncology patients
- ◆ Apply and competently participate in interventional vascular radiology and neuroradiology procedures and participate in them in a competent manner
- ◆ Perform breast and brachytherapy procedures and collaborate with the medical team in their performance
- ◆ Perform other image-guided procedures, such as punctures and biopsies, in a proficient manner
- ◆ Utilize advanced technology in radiology safely and effectively, and continually update their knowledge and skills in this constantly evolving field

# 04

# Course Management

TECH has brought together in this university program an excellent teaching team specialized in clinical care and assistance in the area of Diagnostic Imaging and Treatment, Nuclear Medicine and Radiation Oncology. Their high professional skills in this field are combined with their teaching skills in academic institutions, as well as their research work with articles published in journals and congresses of this specialty. Likewise, thanks to their proximity, students will be able to resolve any doubts they may have about the content of this Professional Master's Degree.





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*A university degree integrated by professors with an excellent track record in Diagnostic and Treatment Imaging Areas (ADTI) of reference hospitals”*

## Management



### Ms. Viciano Fernández, Carolina

- ♦ Nurse in the Radiodiagnosis and Nuclear Medicine
- ♦ University Diploma in Nursing
- ♦ Master's Degree in Pediatric Nursing
- ♦ University Specialist in Emergency and Catastrophe Nursing
- ♦ University Specialist in Nursing in the Surgical Area
- ♦ Radioactive Facilities Operator License in Nuclear Medicine by the Nuclear Safety Council



### Ms. García Argüelles, Noelia

- ♦ Area Supervisor of Diagnostic Imaging and Treatment at the Asturias University Central Hospital
- ♦ Lecturer in the Department of Medicine at the University of Oviedo
- ♦ Lecturer at numerous conferences and congresses, including the Congress of the Society of Radiological Nursing
- ♦ University Diploma in Nursing
- ♦ Master's Degree in Prevention Management in the Company
- ♦ Master in Urgency, Emergencies and Catastrophes
- ♦ Member of the panel of auditors authorized by the Quality Assessment Unit of the Health Service of the Principality of Asturias
- ♦ Certificate of Pedagogical Aptitude for Secondary Education Teachers
- ♦ Radioactive Facilities Operator License in Nuclear Medicine by the Nuclear Safety Council

## Professors

### D. Castaño Pérez, Jesús

- ♦ Nurse in the Interventional Vascular Radiology Service at the Asturias University Central Hospital
- ♦ Tutor of MIR Residents in the Specialty of Family and Community Medicine
- ♦ Honorary Collaborator at the University of Oviedo, attached to the Department of Medicine
- ♦ University Diploma in Nursing
- ♦ Specialist Technician in Radiodiagnosis
- ♦ Postgraduate Diploma in Surgical Fields in Nursing
- ♦ Specialist in Family and Community Nursing
- ♦ Nuclear Safety Council Radioactive Facilities Operator's License

### Ms. Rodríguez Manzano, María Ángeles

- ♦ Supervisor of the Radiation Oncology Service at the Central University Hospital of Asturias
- ♦ Teaching collaborator in AGORASTUR, training in theoretical and practical workshops for auxiliary nursing care technicians
- ♦ University Diploma in Nursing
- ♦ Postgraduate Diploma in Hemotherapy
- ♦ Postgraduate Diploma in Intensive Care Nursing
- ♦ Postgraduate Diploma in Dialysis
- ♦ Specialist in Family and Community Nursing
- ♦ Radioactive Facilities Operator License in Radiotherapy. Nuclear Safety Council
- ♦ Teaching collaborator in AGORASTUR, training in theoretical and practical workshops for auxiliary nursing care technicians

### Ms. Busta Díaz, Mónica

- ♦ Supervisor of the Nuclear Medicine Service at the Central University Hospital of Asturias
- ♦ University Diploma in Nursing
- ♦ Bachelor's Degree in History
- ♦ Postgraduate Diploma in Intensive Care Unit Nursing
- ♦ Postgraduate Diploma in in Dialysis Nursing
- ♦ Postgraduate Diploma in Surgical Fields in Nursing
- ♦ Postgraduate Diploma in Hemotherapy
- ♦ Nuclear Medicine Radioactive Installations Operator's License. Nuclear Safety Council
- ♦ Member of: Scientific Committee during the XX Congress of the Spanish Society of Radiological Nursing 2022

### Ms. Álvarez Noriega, Paula

- ♦ Supervisor of the Radiodiagnostics Service at the Central University Hospital of Asturias
- ♦ Honorary Collaborator attached to the Department of Medicine of the University of Oviedo and the Adolfo Posada Institute
- ♦ University Diploma in Nursing
- ♦ Master's Degree in Prevention Management in the Company
- ♦ Master's Degree in Support Treatment and Palliative Care in Oncology Patients
- ♦ Postgraduate Diploma from in Hemotherapy Nursing
- ♦ Nuclear Medicine Radioactive Installations Operator License by the Nuclear Safety Council

05

# Structure and Content

The syllabus of this university program has been prepared by an excellent teaching team that provides the most current, objective information and criteria based on literature and real clinical practice. In this way, students will achieve an effective update on the role of the nurse in the DTI service, the Specialized Nurse Consultation, CT, MRI, MN service, OR and Brachytherapy service, Interventional Vascular Radiology and Neuroradiology and in the Diagnostic Imaging Unit of Breast Pathology. This will begin a process of updating for the correct performance of patient care, safety and follow-up.





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*A syllabus that has an extensive Virtual Library,  
available 24 hours a day, 7 days a week”*

## Module 1. Radiological Nursing Care management and organization of the Diagnostic Imaging and Diagnostic Treatment Area

- 1.1. Diagnostic Imaging and Treatment
  - 1.1.1. History of Diagnostic Imaging and Treatment
  - 1.1.2. Introduction to X-rays: Ionizing Radiation
  - 1.1.3. Legislation and Current Regulations
  - 1.1.4. Biophysical Fundamentals of Radiation, Ultrasound and Magnetic Fields
  - 1.1.5. Health Equipment in the Field of Electromagnetic Radiations or Radioactive Sources
- 1.2. Radiological Nursing Training and Performance
  - 1.2.1. History of Radiological Nursing
  - 1.2.2. Radiological Nursing Scope of Action
  - 1.2.3. Radiological Anatomy and Physiology
  - 1.2.4. Management of the Surgical Environment, Life Support and Patient Safety
  - 1.2.5. Contrast Media, Radiopharmaceuticals and Medication
- 1.3. Diagnostic Imaging and Treatment Area: Diagnostic Imaging and Treatment Services, Nuclear Medicine, Radiation Oncology and Brachytherapy, Radiophysics and Radiological Protection
  - 1.3.1. Organizational Structure of the Hospital
  - 1.3.2. Organizational Chart of the Area
  - 1.3.3. Organizational Chart of the Service or Unit
  - 1.3.4. Portfolio of Services
  - 1.3.5. Nursing Care Management
- 1.4. Organization and Coordination of Human Talent
  - 1.4.1. Theoretical Framework
  - 1.4.2. CFW and Competency Management
  - 1.4.3. Multidisciplinary Team
  - 1.4.4. Welcome Plan for New Professionals
- 1.5. Knowledge Management
  - 1.5.1. Undergraduate and Postgraduate Training
  - 1.5.2. Continuous and Refresher Training
  - 1.5.3. Socialization of Knowledge
    - 1.5.3.1. Clinical Sessions
    - 1.5.3.2. Conferences
    - 1.5.3.3. Workshops
    - 1.5.3.4. Training Pills
  - 1.5.4. Specific Trainings
- 1.6. Supervision and Control of Equipment and Installations
  - 1.6.1. Equipment Inventory
  - 1.6.2. Maintenance and Calibrations
  - 1.6.3. Technical and Legal Requirements for Structures
  - 1.6.4. Incident Management
- 1.7. Care process
  - 1.7.1. Reception and Unequivocal Identification
  - 1.7.2. Medical Records, Specific Digital Supports and Registers
  - 1.7.3. Effective Communication
  - 1.7.4. SOPs (standardized work plans), Protocols and Clinical Guidelines
  - 1.7.5. PAE (Nursing Care Process)
- 1.8. Humanization of Care
  - 1.8.1. Holistic Health Care
  - 1.8.2. User and Professional Satisfaction
  - 1.8.3. The Nurse's Viewpoint
- 1.9. Environmental and Financial Sustainability
  - 1.9.1. Waste Management
  - 1.9.2. Sustainable Consumption: Recycling of contrasts
  - 1.9.3. Contrasts of the Future, Sustainable Use
- 1.10. Future Challenges
  - 1.10.1. Training in the Nursing Degree: Practicum Rotations
  - 1.10.2. Specific Training in Radiological Nursing
  - 1.10.3. Performance Evaluation
  - 1.10.4. DTI Service Day Hospital



## Module 2. Nursing in the Diagnostic Imaging and Treatment Service (DTI). Nursing Consultation

- 2.1. Nursing Role in a DTI Service
  - 2.1.1. Definition of Advanced Practice Nursing (APN)
  - 2.1.2. History of Advanced Practice Nursing
  - 2.1.3. Current status of Advanced Practice Nursing
- 2.2. Role of the APN in the Nursing Consultation of a DTI Service
  - 2.2.1. Historical Development of an ITN Service
  - 2.2.2. Historical Evolution of Care in an ITD Department
  - 2.2.3. Role of the PPS in the Nursing Consultation of a DTI Department
- 2.3. Contrast Media in Diagnostic Imaging and Treatment
  - 2.3.1. Definition and Types of Contrast Media
  - 2.3.2. Chemical Properties of Contrast Media
  - 2.3.3. Classification of Contrast Media
  - 2.3.4. Routes of administration of contrast media in Diagnostic and Treatment Imaging
- 2.4. Adverse Reactions Due to Contrast Media Administration
  - 2.4.1. Toxicity Due to Contrast Media Administration
  - 2.4.2. Renal Toxicity Due to Contrast Media Administration
  - 2.4.3. Hypersensitivity Reactions Due to the Administration of Contrast Media
  - 2.4.4. Others Toxicity Due to Contrast Media Administration
  - 2.4.5. Extravasation of Peripheral Venous Route Due to Contrast Administration
- 2.5. Contrast Screening. The Importance of Renal Function in the Administration of Contrast Media
  - 2.5.1. Contrast-induced Nephropathy. Definition
  - 2.5.2. Risk Factors in Contrast-Induced Nephropathy
  - 2.5.3. Risk Diagnosis in Contrast-Induced Nephropathy
- 2.6. Contrast Screening. Role of the EPA in the Indication of an Iodinated Contrast Medium according to Renal Function
  - 2.6.1. Review of the Patient's Medical History
  - 2.6.2. General Recommendations Before the Administration of an Iodinated Contrast Medium
  - 2.6.3. Prevention and Follow-up of Iodinated Contrast-induced Nephropathy

- 2.7. Contrast Screening. Role of EPA in the Administration of Other Contrast Media According to Renal Function
  - 2.7.1. Impact of the Administration of Non-Iodinated Contrast Media on Renal Function
  - 2.7.2. Gadolinium-based Contrast Media and Renal Function
  - 2.7.3. Impact of Other Contrast Media on Renal Function
- 2.8. Contrast Screening. Hypersensitivity Reactions to Contrast Media
  - 2.8.1. Definition of Hypersensitivity Reaction
  - 2.8.2. Classification of Hypersensitivity Reactions
  - 2.8.3. Risk Factors for Hypersensitivity Reactions to Contrast Media
  - 2.8.4. Diagnosis of a Hypersensitivity Reactions to Contrast Media
- 2.9. Contrast Screening. Role of the EPA in the Presence of a Previous History of Contrast Hypersensitivity Reactions
  - 2.9.1. Review of the Patient's Medical History
  - 2.9.2. Prevention of Hypersensitivity Reactions to Iodinated Contrast Media
  - 2.9.3. Prevention of Hypersensitivity Reactions to Gadolinium-based Contrast Media
  - 2.9.4. Prevention of Hypersensitivity Reactions to Other Contrast Agents
- 2.10. Management of Imaging Tests
  - 2.10.1. The Importance of the Diagnostic Imaging and Treatment Service in the Health System
  - 2.10.2. Nursing Knowledge
  - 2.10.3. The Need to Record

## Module 3. Computerized Tomography

- 3.1. CT and Components of a Unit
  - 3.1.1. History and Evolution of Computerized Tomography
  - 3.1.2. Definition and Application
  - 3.1.3. Physical Fundamentals, Elements and Components involved in Computed Tomography Imaging
  - 3.1.4. Contrasts, Acquisition Time and Resolution
  - 3.1.5. Artifacts
  - 3.1.6. Room Characteristics

- 3.2. Scanning Objectives
  - 3.2.1. Introduction
  - 3.2.2. Muscle and Bone Disorders, Bone Tumors, and Fractures
  - 3.2.3. Localization of Tumors, Infections or Blood Clots
  - 3.2.4. Guidance for Procedures such as Surgeries, Biopsies and Radiotherapy
  - 3.2.5. Detection and control of diseases such as Cancer, Heart Disease, Lung Nodules and Liver Tumors
  - 3.2.6. Monitoring the Effectiveness of Certain Treatments
  - 3.2.7. Detecting Internal Injuries and Internal Bleeding
- 3.3. Risks of the Exploration
  - 3.3.1. Radiation Exposure
  - 3.3.2. Reactions to Contrast Material
  - 3.3.3. Sedation
- 3.4. Neurological Examination
  - 3.4.1. Description and Protocols
  - 3.4.2. Preparation
  - 3.4.3. Nursing Care Process
- 3.5. Musculoskeletal Examination
  - 3.5.1. Description and Protocols
  - 3.5.2. Preparation
  - 3.5.3. Nursing Care Process
- 3.6. Vascular Explorations I
  - 3.6.1. Description and Protocols
  - 3.6.2. Preparation
  - 3.6.3. Nursing Care Process
- 3.7. Vascular Examinations II Cardiac Examinations
  - 3.7.1. Description and Protocols
  - 3.7.2. Preparation
  - 3.7.3. Nursing Care Process
- 3.8. Examination of Abdomen
  - 3.8.1. Description and Protocols
  - 3.8.2. Preparation
  - 3.8.3. Nursing Care Process

- 3.9. Pediatric Examinations
  - 3.9.1. Description and Protocols
  - 3.9.2. Preparation
  - 3.9.3. Nursing Care Process
- 3.10. Interventions
  - 3.10.1. Description and Protocols
  - 3.10.2. Preparation
  - 3.10.3. Nursing Care Process

## Module 4. Magnetic Resonance

- 4.1. What is an MRI?
  - 4.1.1. Introduction
  - 4.1.2. History of Magnetic Resonance Imaging and its Evolution
  - 4.1.3. Definition and Application
  - 4.1.4. Physical Fundamentals, Elements and Components involved in Magnetic Resonance Imaging
- 4.2. Components of a Magnetic Resonance Equipment
  - 4.2.1. Contrasts, Acquisition Time and Resolution
  - 4.2.2. Artefacts
  - 4.2.3. Room Characteristics
- 4.3. Scanning Objectives
  - 4.3.1. Introduction
  - 4.3.2. Central Nervous System Diagnostic Studies
  - 4.3.3. Abdominal and Gynecological Diagnostic Studies
  - 4.3.4. Diagnostic Studies of Breast and Pulmonary Angiography
  - 4.3.5. Diagnostic Studies of Musculoskeletal Lesions
  - 4.3.6. Cardiac Diagnostic Studies
- 4.4. Risks of the Exploration
  - 4.4.1. Implanted Metal Objects
  - 4.4.2. Reactions to Contrast Material
  - 4.4.3. Sedation-Related Risks
- 4.5. Neurological Examination
  - 4.5.1. Description and Protocols
  - 4.5.2. Preparation
  - 4.5.3. Nursing Care Process

- 4.6. Pediatric Examinations
    - 4.6.1. Description and Protocols
    - 4.6.2. Preparation
    - 4.6.3. Nursing Care Process
  - 4.7. Musculoskeletal Examination
    - 4.7.1. Description and Protocols
    - 4.7.2. Preparation
    - 4.7.3. Nursing Care Process
  - 4.8. Abdominal and Gynecological Examinations
    - 4.8.1. Description and Protocols
    - 4.8.2. Preparation
    - 4.8.3. Nursing Care Process
  - 4.9. Thoracic Explorations: Breast and Pulmonary Angiography
    - 4.9.1. Description and Protocols
    - 4.9.2. Preparation
    - 4.9.3. Nursing Care Process
  - 4.10. Cardiac Examinations
    - 4.10.1. Description and Protocols
    - 4.10.2. Preparation
    - 4.10.3. Nursing Care Process
- Module 5. Nuclear Medicine I**
- 5.1. What is Nuclear Medicine?
    - 5.1.1. Introduction to Nuclear Medicine
    - 5.1.2. History of Nuclear Medicine
    - 5.1.3. Fields of Application of Nuclear Medicine
    - 5.1.4. Radiopharmaceuticals
  - 5.2. Physical Fundamentals of Nuclear Medicine
    - 5.2.1. Key Concepts
    - 5.2.2. Structure of Matter
    - 5.2.3. Electromagnetic Radiation
    - 5.2.4. Atomic Structure Bohr Atom
    - 5.2.5. Nuclear Structure
    - 5.2.6. Radioactivity and Nuclear Reactions
    - 5.2.7. Interaction of Radiation with Matter
  - 5.3. Chemical Fundamentals of Nuclear Medicine
    - 5.3.1. Key Concepts
    - 5.3.2. Obtaining Radionuclides
    - 5.3.3. Radionuclide Generators
    - 5.3.4. Structure of a Molybdenum/Tcnetium Generator
    - 5.3.5. Tagging Mechanisms
  - 5.4. Radiopharmaceuticals
    - 5.4.1. Characteristics of the Ideal Radiopharmaceutical
    - 5.4.2. Physical Form and Routes of Administration of Radiopharmaceuticals
    - 5.4.3. Localization Mechanisms of Radiopharmaceuticals
  - 5.5. Fundamentals of Radiological Prevention in Nuclear Medicine
    - 5.5.1. Key Concepts
    - 5.5.2. Quantities and Units
    - 5.5.3. Fundamentals of Radiological Prevention in Nuclear Medicine
      - 5.5.3.1. Patients
      - 5.5.3.2. Workers and Members of the Public
      - 5.5.3.3. Pregnancy and Breastfeeding
  - 5.6. Fundamentals of Radiological Prevention and Medical Physics in Nuclear Medicine
    - 5.6.1. Key Concepts
    - 5.6.2. Radiation Detection and Measurement
      - 5.6.2.1. Gas Ionization Detectors
      - 5.6.2.2. Semiconductor Detectors
      - 5.6.2.3. Scintillation Detectors
    - 5.6.3. Radiation Protection Standards
  - 5.7. Radioactive Waste
    - 5.7.1. Key Concepts
    - 5.7.2. Radioactive Sources out of Use
    - 5.7.3. Solid Waste Materials with Radioactive Content
    - 5.7.4. Liquid Radioactive Waste
  - 5.8. Instrumentation in Nuclear Medicine
    - 5.8.1. Key Concepts
    - 5.8.2. Activimeter or Dose Calibrators

- 5.8.3. Gamma Camera and SPECT
  - 5.8.3.1. Gammacamera Detectors
  - 5.8.3.2. Collimation
  - 5.8.3.3. Image Correctors
  - 5.8.3.4. Planar Image Formation
  - 5.8.3.5. Tomographic Acquisition
- 5.8.4. PET
  - 5.8.4.1. Detectors Used in PET
  - 5.8.4.2. PET Image Formation
- 5.9. Radiometabolic Therapy
  - 5.9.1. Treatment of Metastatic Bone Pain
  - 5.9.2. Treatment of Differentiated Thyroid Cancer
  - 5.9.3. Treatment of Hyperthyroidism
  - 5.9.4. Treatment of Non-Hodgkin's Lymphoma
  - 5.9.5. Treatment of Neuroendocrine Tumors
  - 5.9.6. Radiosynoviorthesis
- 5.10. Scans performed in PET. Nursing care and attention
  - 5.10.1. Radionuclides and radiopharmaceuticals in PET
  - 5.10.2. Types of Studies
  - 5.10.3. Nursing Care at the PET-FDG
  - 5.10.4. Nursing Care in the PET-Colina
  - 5.10.5. Nursing care in the PET-Vizamil PET
  - 5.10.6. Nursing Care at the PET-DOPA
  - 5.10.7. Nursing Care at the PET-PSMA
  - 5.10.8. Nursing Care in the Myocardial Viability PET
- 6.2. Isotopic studies in Digestive Pathology. Nursing Care and Attention
  - 6.2.1. Anatomophysiological Recall
  - 6.2.2. Salivary Gammagraphy
  - 6.2.3. Esophageal Transit Scintigraphy
  - 6.2.4. Gastric scintigraphy Detection of ectopic gastric mucosa Meckel's Diverticulum
  - 6.2.5. Gastric Emptying Scintigraphy
  - 6.2.6. Gammagraphy for detection of Gastroesophageal Reflux
  - 6.2.7. Gammagraphy for the diagnosis of Digestive Hemorrhage
- 6.3. Isotopic studies in splenic and biliary pathology. Nursing Care and Attention
  - 6.3.1. Anatomophysiological Recall
  - 6.3.2. Hepatosplenic Scintigraphy
  - 6.3.3. Hepatobiliary Gammagraphy
  - 6.3.4. Bad absorption of biliary salts
- 6.4. Isotopic studies in Endocrinology. Nursing Care and Attention
  - 6.4.1. Isotopic studies for diagnosis from Thyroid Pathology
  - 6.4.2. Isotopic studies for diagnosis from Parathyroid Pathology
  - 6.4.3. Isotopic studies for diagnosis from Adrenal Glands Pathology
- 6.5. Isotopic studies in Cardiology. Nursing Care and Attention
  - 6.5.1. Study of Cardiac Function
    - 6.5.1.1. Equilibrium ventriculography
    - 6.5.1.2. First-pass ventriculography
  - 6.5.2. Study of Myocardial Perfusion
    - 6.5.2.1. Myocardial perfusion SPECT during exercise
    - 6.5.2.2. Myocardial perfusion SPECT at rest
  - 6.5.3. PET
- 6.6. Isotopic studies in Pneumology. Nursing Care and Attention
  - 6.6.1. Anatomophysiological Recall
  - 6.6.2. Studies for the diagnosis of pulmonary thromboembolism
    - 6.6.2.1. Pulmonary Ventilation Scintigraphy
    - 6.6.2.2. Pulmonary Perfusion Scintigraphy
  - 6.6.3. Diffuse Interstitial Lung Disease Evaluation Scintigraphy
  - 6.6.4. Gammagraphy in the evaluation of Infectious Processes
  - 6.6.5. Gammagraphy in the evaluation of Thoracic Neoplasms

## Module 6. Nuclear Medicine II Isotopic Studies

- 6.1. Isotopic studies of the musculoskeletal system. Nursing care and attention
  - 6.1.1. Bone scintigraphy
  - 6.1.2. Three-phase bone scintigraphy
  - 6.1.3. Bone Marrow Gammagraphy
  - 6.1.4. Isotopic studies for diagnosis in Inflammatory and Infectious Pathology
    - 6.1.4.1.  $^{67}\text{Ga}$
    - 6.1.4.2. Labeled leukocytes

- 6.7. Isotopic studies in Neurology. Nursing Care and Attention
  - 6.7.1. Anatomophysiological Recall
  - 6.7.2. Brain perfusion SPECT Technique Clinical applications
  - 6.7.3. Studies for the diagnosis of Epilepsies
    - 6.7.3.1. CSF fistula detection. Cisternography
  - 6.7.4. Studies for the diagnosis of Movement Disorders
    - 6.7.4.1. Studies for the differential diagnosis of Parkinsonisms
    - 6.7.4.2. Study of Dopamine Transporters DATSCAN
    - 6.7.4.3. Study of postsynaptic D2 Dopaminergic Dopamine Receptors 123I-IBZM
    - 6.7.4.4. Myocardial Sympathetic Denervation Study with 123I-MIBG
  - 6.7.5. Studies for the diagnosis of Cerebrovascular Pathology and Encephalic Death 99Tc-HMPAO
- 6.8. Isotopic studies in Nephrourology. Nursing Care and Attention
  - 6.8.1. Anatomophysiological Recall
  - 6.8.2. Studies for the diagnosis of Renal Functionality.. Glomerular filtration
  - 6.8.3. Isotopic Renogram
  - 6.8.4. Renal Cortical Gammagraphy: DMSA
  - 6.8.5. Isotopic cystography
  - 6.8.6. Scrotal or testicular scintigraphy
- 6.9. Isotopic studies in Vascular Pathology. Nursing Care and Attention
  - 6.9.1. Anatomophysiological Recall
  - 6.9.2. Isotopic phlebography
  - 6.9.3. Lymphogrammagraphy
  - 6.9.4. Sentinel lymph node study
    - 6.9.4.1. Sentinel Lymph Node in Breast Cancer
    - 6.9.4.2. Sentinel lymph node in malignant melanoma
    - 6.9.4.3. Sentinel node in other applications
- 6.10. Isotopic studies in Oncology. Nursing Care and Attention
  - 6.10.1. Tracking with 67 Ga citrate
  - 6.10.2. Tracking with 99mTc-sestaMIBI
  - 6.10.3. Traceback with 123I-MIBG and 131I-MIBG
  - 6.10.4. Traceback with labeled peptides
  - 6.10.5. Traceback with labeled monoclonal antibodies

## Module 7. Radiation Oncology

- 7.1. What is Radiotherapy?
  - 7.1.1. Introduction
  - 7.1.2. Ionizing radiation and cancer treatment
  - 7.1.3. Use of ionizing radiation in benign pathologies
  - 7.1.4. Types of Radiotherapy
- 7.2. Ionizing radiation treatments External Radiotherapy
  - 7.2.1. Linear Accelerators
  - 7.2.2. Simulation equipment
  - 7.2.3. Different treatments with external radiotherapy
    - 7.2.3.1. Three-dimensional radiotherapy RTE 3D
    - 7.2.3.2. Intensity modulated radiotherapy IMRT/ VMAT
    - 7.2.3.3. Stereotactic radiation therapy SBRT
    - 7.2.3.4. Image-guided radiation therapy Radiosurgery (SRS)
    - 7.2.3.5. Proton beam therapy
- 7.3. The radiotherapeutic process
  - 7.3.1. Initial evaluation and therapeutic decision
  - 7.3.2. Simulation
    - 7.3.2.1. Masks and other immobilization systems
    - 7.3.2.2. Nursing Consultation
  - 7.3.3. Delineation or localization of volumes Treatment planning Treatment Verification
- 7.4. Head and Neck Radiotherapy
  - 7.4.1. Introduction
  - 7.4.2. Nursing consultation at the start of treatment
  - 7.4.3. Potential complications and nursing care
  - 7.4.4. Specific ostomy care
- 7.5. Breast radiotherapy
  - 7.5.1. Introduction
  - 7.5.2. Nursing consultation at the beginning of treatment Nursing indications
  - 7.5.3. Potential complications and nursing care
- 7.6. Abdomino-pelvic radiotherapy
  - 7.6.1. Introduction
  - 7.6.2. Nursing consultation at the beginning of treatment Nursing indications
  - 7.6.3. Potential complications and nursing care

- 7.7. CNS Radiotherapy
  - 7.7.1. Introduction
  - 7.7.2. Nursing consultation at the beginning of treatment Nursing indications
  - 7.7.3. Potential complications and nursing care
- 7.8. Radiotherapy in other locations
  - 7.8.1. RTE Lung. Nursing Care
  - 7.8.2. RTE skin. Nursing Care
  - 7.8.3. RTE bone localization Nursing care
  - 7.8.4. Total Body irradiation. TBI
- 7.9. Palliative Radiotherapy
  - 7.9.1. Introduction
  - 7.9.2. Pain Management
  - 7.9.3. Psychological Aspects
- 7.10. Radiotherapy Emergencies
  - 7.10.1. Introduction
  - 7.10.2. Vena Cava Syndrome
  - 7.10.3. Compressive syndromes
  - 7.10.4. Hemorrhages

## Module 8. Vascular Interventional Radiology and Neuroradiology Nursing

- 8.1. Interventions
  - 8.1.1. Interventional Radiology History
  - 8.1.2. Nursing in interventional radiology
  - 8.1.3. The Interventional Vascular Radiology Operating Room (IVR)
- 8.2. Radiological protection and characteristics of the IVR room
  - 8.2.1. Radiological Protection
  - 8.2.2. RVI room, composition
  - 8.2.3. The Angiograph
- 8.3. Asepsis and sterility in the Operating Room of Interventional Vascular Radiology (IVR)
  - 8.3.1. Concept of Asepsis
  - 8.3.2. Concept of Sterility
  - 8.3.3. Circulation in the operating room
  - 8.3.4. IVR room ventilation





- 8.4. Anesthesia
  - 8.4.1. Anesthesia cart
  - 8.4.2. Patient Monitoring
  - 8.4.3. General Anesthesia
  - 8.4.4. Allergic Reaction
  - 8.4.5. Medication
  - 8.4.6. Knowledge of basic and advanced CPR maneuvers
- 8.5. Nursing Care at Interventional Radiology
  - 8.5.1. Review of the clinical history
  - 8.5.2. Reception of the patient in the service
  - 8.5.3. Surveillance and care of the patient in the operating room
  - 8.5.4. Recording of nursing care (Nursing care process PAE)
  - 8.5.5. Transfer to the inpatient ward
- 8.6. Non-Vascular Procedures
  - 8.6.1. Renal Via
    - 8.6.1.1. Percutaneous Nephrostomy
    - 8.6.1.2. Nephrostomy Catheter Replacement
      - 8.6.1.2.1. Simple
      - 8.6.1.2.2. Mixed
  - 8.6.2. Biliary Tract
    - 8.6.2.1. Bile Duct Drainages
    - 8.6.2.2. Bile Duct Dilatation
    - 8.6.2.3. Bile Duct Prosthesis
    - 8.6.2.4. Brushing and biopsy Biliary tract
    - 8.6.2.5. Taking pressures Biliary tract
  - 8.6.3. Gastric Tract
    - 8.6.3.1. PEG (Gastrostomy)
    - 8.6.3.2. Alpha maneuver
    - 8.6.3.3. Rendez Vous

- 8.7. Diagnostic Vascular Procedures
  - 8.7.1. Diagnostic arteriography
  - 8.7.2. Fistulography
  - 8.7.3. Phlebography
  - 8.7.4. Hepatic transjugular biopsy
  - 8.7.5. Taking of vena cava pressures
  - 8.7.6. Suprarenal Vein Sampling
- 8.8. Therapeutics Vascular Procedures
  - 8.8.1. Hickman
  - 8.8.2. Shaldon
  - 8.8.3. Reservoir
  - 8.8.4. Arterial angioplasty
    - 8.8.4.1. Angioplasty MMII arteries
    - 8.8.4.2. Visceral arteries angioplasty (Renal, Hepatic)
  - 8.8.5. Placement of prosthesis (Stent)
  - 8.8.6. Vena Cava Filter Implantation and Removal
  - 8.8.7. Porto-caval shunt
  - 8.8.8. Embolization Active bleeding
    - 8.8.8.1. Hemoptysis
    - 8.8.8.2. Prostate Embolization
    - 8.8.8.3. Postpartum uterine bleeding
  - 8.8.9. Tumor Embolizations (TACE ,TARE)
  - 8.8.10. VaricoceleVaricocele
  - 8.8.11. Renal Embolization
  - 8.8.12. Fibrinolysis
  - 8.8.13. Pulmonary thrombectomy
  - 8.8.14. Angioplasty Fistulography
  - 8.8.15. Superior Cava Territory Angioplasty
- 8.9. Neuroradiology Diagnostic Procedures
  - 8.9.1. Cerebral Arteriography
    - 8.9.1.1. Cerebral arteriography radial access, benefits
    - 8.9.1.2. Medullary arteriography
    - 8.9.1.3. T.SA arteriography
    - 8.9.1.4. Occlusion test
    - 8.9.1.5. Petrosal Sinus Test

- 8.10. Neuroradiology Therapeutics Procedures
  - 8.10.1. Epistaxis
  - 8.10.2. External Carotid Embolization
  - 8.10.3. Vasospasm
  - 8.10.4. Embolization Subarachnoid Hemorrhage (aneurysm)
  - 8.10.5. AVM embolization
  - 8.10.6. AVF embolization
  - 8.10.7. ICTUS
  - 8.10.8. Stents
    - 8.10.8.1. Internal Carotid Stent
    - 8.10.8.2. Flow Diverter Stent (flow diverter)
    - 8.10.8.3. Intracranial Stent
  - 8.10.9. Vertebroplasty

## Module 9. Breast and Brachytherapy

- 9.1. Diagnostic Imaging in Breast Pathologies
  - 9.1.1. History of Diagnostic Imaging in Breast Pathologies
  - 9.1.2. Techniques: Mammography, Ultrasonography and Magnetic Resonance Imaging
  - 9.1.3. Techniques: Gammagraphy Positron Emission Tomography
- 9.2. Breast MR mammography
  - 9.2.1. Mammography with and without contrast
    - 9.2.1.1. Vacuum aspiration biopsy by Stereotaxy
      - 9.2.1.1.1. Technique Preparation Risks
      - 9.2.1.1.2. Nursing Care Process. Needs assessment and diagnosis
      - 9.2.1.1.3. Nursing Care Process. Planning
      - 9.2.1.1.4. Nursing Care Process. Execution of care and evaluation of care
  - 9.2.2. Limitations
    - 9.2.2.1. Vacuum aspiration biopsy by MRI
      - 9.2.2.1.1. Technique Preparation Risks
      - 9.2.2.1.2. Nursing Care Process. Needs assessment and diagnosis
      - 9.2.2.1.3. Nursing Care Process. Planning
      - 9.2.2.1.4. Nursing Care Process. Execution of care and evaluation of care



- 9.3. Ultrasound and Harpoon Placement
  - 9.3.1. Ultrasound
    - 9.3.1.1. Vacuum aspiration biopsy by Ultrasound
    - 9.3.1.2. Cryoablation
    - 9.3.1.3. Technique Preparation Risks
    - 9.3.1.4. Nursing Care Process. Needs assessment and diagnosis
    - 9.3.1.5. Nursing Care Process. Planning
    - 9.3.1.6. Nursing Care Process. Execution of care and evaluation of care
  - 9.3.2. Placement of Harpoon for programmed surgery
    - 9.3.2.1. Technique Preparation Risks
    - 9.3.2.2. Nursing Care Process. Needs assessment and diagnosis
    - 9.3.2.3. Nursing Care Process. Planning
    - 9.3.2.4. Nursing Care Process. Execution of care and evaluation of care
- 9.4. FNA (Fine Needle Puncture and Aspiration)
  - 9.4.1. Technique Preparation Risks
  - 9.4.2. Nursing Care Process. Needs assessment and diagnosis
  - 9.4.3. Nursing Care Process. Planning
  - 9.4.4. Nursing Care Process. Execution of care and evaluation of care
- 9.5. BAG (Biopsy with Thick Needle)
  - 9.5.1. Technique Preparation Risks
  - 9.5.2. Nursing Care Process Assessment and Diagnosis of Needs
  - 9.5.3. Nursing Care Process. Planning
  - 9.5.4. Nursing Care Process. Execution of care and evaluation of care
- 9.6. Seed or scout breast marking
  - 9.6.1. Technique Preparation Risks
  - 9.6.2. Nursing Care Process. Needs assessment and diagnosis
  - 9.6.3. Nursing Care Process. Planning
  - 9.6.4. Nursing Care Process. Execution of care and evaluation of care
- 9.7. Brachytherapy Brachytherapy Unit
  - 9.7.1. Introduction History
  - 9.7.2. Structure of a Brachytherapy Unit
  - 9.7.3. Types of radioactive sources
  - 9.7.4. Most frequent uses

- 9.8. Prostate Brachytherapy
  - 9.8.1. Introduction
  - 9.8.2. Nursing Care in Low-Rate Prostatic BQ
    - 9.8.2.1. Preliminary care
    - 9.8.2.2. Pre-implantation care
  - 9.8.3. Nursing Care in HIGH-Rate Prostatic BQ
- 9.9. Cervical brachytherapy
  - 9.9.1. Introduction
  - 9.9.2. Indications/Preliminary Nursing Care
  - 9.9.3. Attention in the operating room
  - 9.9.4. Post- Intervention Care
- 9.10. Brachytherapy and skin lesions
  - 9.10.1. Introduction
  - 9.10.2. Preliminary Nursing Care
  - 9.10.3. Attention in operating room
  - 9.10.4. Post- Intervention Care

## Module 10. Other Image-Guided Procedures

- 10.1. Ultrasound-Guided Interventions. Part One
  - 10.1.1. Principles of Ultrasound
  - 10.1.2. Pediatric radiology
    - 10.1.2.1. Echocystography
    - 10.1.2.2. Intussusception (invaginations)
    - 10.1.2.3-PAAF and BAG
  - 10.1.3. Thyroid FNA
  - 10.1.4. MSK BAG (musculoskeletal)
  - 10.1.5. Ultrasound-guided fine needle interventionism and ultrasound-guided lavage of shoulder calcifications

- 10.2. Ultrasound-Guided Interventions. Part Two Core Needle Ultrasound-Guided Interventional Procedures in Hepatic and Renal Pathology
  - 10.2.1. Hepatic BAG
  - 10.2.2. Renal BAG
    - 10.2.2.1. Native kidney
    - 10.2.2.2. Renal graft
- 10.3. Other ultrasound procedures
  - 10.3.1. Ultrasound with Microbubble contrast
  - 10.3.2. Ultrasound-guided nursing techniques
  - 10.3.3. Ultrasound with Prostaglandin or Cavernosography
- 10.4. Radiological tests in the remote control
  - 10.4.1. Retrograde cystourethrograms
  - 10.4.2. Hysterosalpingography
  - 10.4.3. Gastroduodenal esophageal transit (GORD) and intestinal transit
  - 10.4.4. Opaque enema
  - 10.4.5. Videodeglutition
  - 10.4.6. Trans-Kher cholangiography
  - 10.4.7. Myelography
- 10.5. Optical Coherence Tomography(OCT)
  - 10.5.1. The eye as an image-forming system
  - 10.5.2. Principles of OCT
  - 10.5.3. Role of Nurses
- 10.6. Dual-energy X-ray absorptiometry or bone density examination (DEXA or DXA)
  - 10.6.1. Osteoporosis and Indications of the Technique
  - 10.6.2. DXA preparation and examination
  - 10.6.3. Results and benefits
- 10.7. Hemodynamics
  - 10.7.1. Introduction
  - 10.7.2. Indications
  - 10.7.3. Nursing Care
- 10.8. Cholangiopancreatography (CPR)
  - 10.8.1. Introduction
  - 10.8.2. Indications
  - 10.8.3. Nursing Care





- 10.9. Lithotripsy
  - 10.9.1. Introduction
  - 10.9.2. Indications
  - 10.9.3. Nursing Care
- 10.10. PACs, Picture Archiving and Communication Systems
  - 10.10.1. Definition and objectives
  - 10.10.2. Components
    - 10.10.2.1. Image Acquisition
    - 10.10.2.2. Communication Networks
  - 10.10.3. Image Management, Visualization and Processing
  - 10.10.4. Types of Storage
  - 10.10.5. Image production classification

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*This program provides an in-depth understanding of the risks to which patients and healthcare professionals involved in the performance of Computed Tomography”*

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.





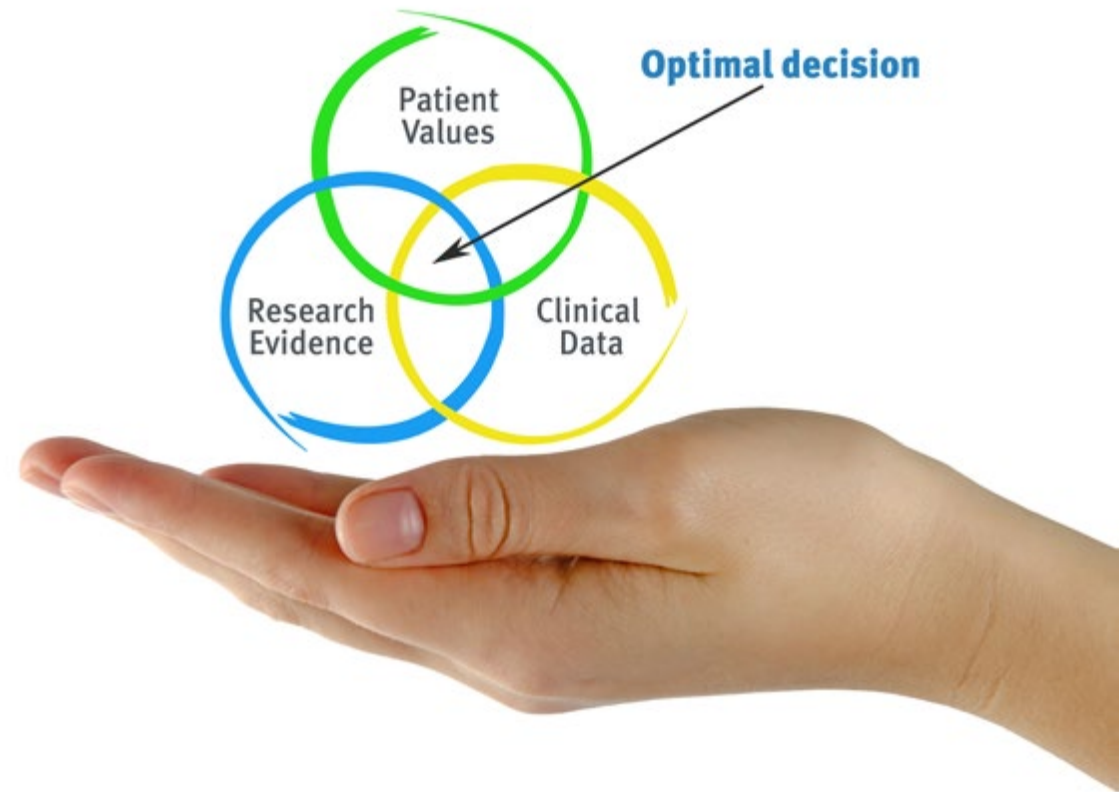
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*Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"*

## At TECH Nursing School we use the Case Method

In a given situation, what should a professional do? 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. Nurses learn better, faster, and more sustainably over time.

*With TECH, nurses can experience a learning methodology 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, in an attempt to recreate the real conditions in professional nursing 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. Nurses who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their knowledge.
2. The learning process has a clear focus on practical skills that allow the nursing professional to better integrate knowledge acquisition into the hospital setting or primary care.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.



## Relearning Methodology

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

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



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



At the forefront of world teaching, the 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 we have trained more than 175,000 nurses with unprecedented success in all specialities regardless of practical workload. 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 really 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.



### Nursing Techniques and Procedures on Video

We introduce you to the latest techniques, to the latest educational advances, to the forefront of current medical techniques. All 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 them as many times as you want.



### Interactive Summaries

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

This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



### Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.





#### Expert-Led Case Studies and Case Analysis

Effective learning ought to be contextual. Therefore, TECH presents real cases in which the expert will guide students, focusing on and solving the different situations: a clear and direct way to achieve the highest degree of understanding.



#### Testing & Retesting

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.



#### Classes

There is scientific evidence suggesting that observing third-party experts can be useful.

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.



07

# Certificate

The Professional Master's Degree in Radiological Nursing guarantees students, in addition to the most rigorous and up-to-date education, access to a Professional Master's Degree diploma issued by TECH Global University.



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

This program will allow you to obtain your **Professional Master's Degree diploma in Radiological Nursing** 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: **Professional Master's Degree in Radiological Nursing**

Modality: **online**

Duration: **12 months**

Accreditation: **60 ECTS**



\*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.



## Professional Master's Degree Radiological Nursing

- » Modality: online
- » Duration: 12 months
- » Certificate: TECH Global University
- » Credits: 60 ECTS
- » Schedule: at your own pace
- » Exams: online

# Professional Master's Degree Radiological Nursing

