

**V year (1st semester)**

Scientific Field	<b>DIAGNOSTIC IMAGING AND RADIOTHERAPY</b>	TUTOR	ECTS
MED/36	Diagnostic Imaging	Santoni Riccardo	1
MED/36	Diagnostic Imaging	Manenti Guglielmo	1
MED/36	Diagnostic Imaging	Gandini Roberto	1
MED/36	Diagnostic Imaging	Chiaravalloti Agostino	1
MED/37	Neuroradiology	Garaci Francesco	1
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**SANTONI R.  
COORDINATOR****SPECIFIC AIMS**

Production of ionizing and non-ionizing radiations and interaction with matter.  
Medical use of ionizing and non-ionizing radiations to obtain images.  
Medical use of ionizing radiations in Radiation Oncology.  
Radiation protection.

**PROGRAM****IMAGING**

Bone system. Respiratory system. Cardiovascular system. Digestive system. Urinary system. Female genital system. Adrenal glands. Breast.  
New techniques to obtain images.  
Interventional Radiology.

TOPICS	- Main techniques to evaluate the bone system.
BONE SYSTEM	- Bone formation and development. - Fundamental bone modifications. - Infective disease of bone. - Bone fractures. - Benign and malignant bone tumors. - Bone metastases. - Main soft tissue pathologies and diagnostic methods.

TOPICS	- Main techniques to evaluate the respiratory system.
RESPIRATORY SYSTEM	- Lung infectious disease. - Lung tumors. - Lung metastases. - Pleural effusions and pleural pathologies. - Mediastinum: techniques of imaging and main pathologies.

TOPICS	- Heart and main vessels: radiological appearance.
CARDIOVASCULAR SYSTEM	- Angiocardiology, cardioangiography, coronary angiography. - Main peripheral vessels and their pathology with particular attention to interventional radiology.

TOPICS	- Normal appearance of the different sectors of the digestive system
DIGESTIVE SYSTEM	- Main techniques to evaluate the digestive system, parotid glands, pharynx, esophagus, stomach and duodenum, small and large intestine, acute abdomen - Imaging and staging of benign and malignant digestive system tumors - Liver and the biliary tract: techniques of imaging and interventional radiology - Pancreas: techniques of imaging for acute and chronic pancreatitis, benign and malignant tumors, exocrine and endocrine tumours

TOPICS	- Main techniques to evaluate the urinary system
URINARY SYSTEM	- The "dumb kidney" - Vascular hypertension. - Benign and malignant tumours.

TOPICS

ADRENAL GLANDS

- Main techniques to evaluate the adrenocortical glands
- Main benign and malignant tumors of the adrenal glands

TOPICS

FEMALE GENITAL SYSTEM

- Main techniques to evaluate the female genital system
- Benign and malignant tumors of the female genital system

TOPICS

BREAST

- Main techniques to evaluate the breast.
- Screening of breast cancer.
- Breast cancer: diagnosis and follow-up.

TOPICS

NEW TECHNIQUES TO OBTAIN IMAGES

- Digital radiography.
- Ultrasounds.
- Computerized Tomography
- Magnetic Resonance.
- Digital Angiography.
- Proton Emission Tomography.

TOPICS

INTERVENTIONAL RADIOLOGY

Interventional Radiology in the different organs and apparatus.

<b>PROGRAM</b> <b>RADIATION ONCOLOGY</b>	Radiobiology. X-Ray and electron production. Acute and late effects of irradiation. Natural history and treatment of the most frequent tumors.
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<b>TOPICS</b> <b>RADIOBIOLOGY</b>	<ul style="list-style-type: none"><li>- Interaction of ionizing radiation with matter.</li><li>- Direct and indirect effects and quality of the radiations.</li><li>- Modification of the response to irradiation.</li><li>- Dose fractionation.</li></ul>
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<b>TOPICS</b> <b>X-RAY AND ELECTRON PRODUCTION</b>	<ul style="list-style-type: none"><li>- Linear accelerators.</li><li>- Radioactive isotopes and Brachytherapy.</li><li>- Dose delivery and combined treatments: Preop- Postop- or exclusive radiation therapy.</li></ul>
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<b>TOPICS</b> <b>ACUTE AND LATE EFFECTS OF IRRADIATION</b>	Classification.
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<b>TOPICS</b> <b>NATURAL HISTORY AND TREATMENT OF THE MOST FREQUENT TUMORS</b>	<ul style="list-style-type: none"><li>- Breast.</li><li>- Lung.</li><li>- Head &amp; Neck.</li><li>- Digestive system.</li><li>- Prostate and male genital apparatus.</li><li>- Female genital apparatus.</li><li>- Lymphomas.</li></ul>
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<b>PROGRAM</b>	- Nuclear decay, isotopes, natural and artificial radioactivity.
<b>NUCLEAR MEDICINE</b>	- Gamma camera and other equipment.
	- Nuclear Medicine in the diagnosis of pathologies of : Bone system Respiratory system Cardiovascular system Endocrine system Liver and biliary tract Urinary tract Central nervous system
	Diagnosis, Staging and Follow-up of malignant tumors.



<b>TEXTBOOKS</b>	<p>Basic Radiology, Second Edition (Mc Graw Hill)          By: Pope, Thomas; Ott, David; Chen, Michael;          Pub Date: August 27th 2010          Format: Paperback 416 pages  <a href="https://www.mhprofessional.com/details.php?isbn=0071766642">https://www.mhprofessional.com/details.php?isbn=0071766642</a></p> <p>Nuclear Medicine:          - Nuclear Medicine: The requisites, 4th edition              Ziessman &amp; O'Malley &amp; Thrall Print Book ISBN: 9780323082990          - Nuclear Medicine Physics: A handbook for Teachers and Students Freely available at:              <a href="http://www.pub.iaea.org/MTCD/Publications/PDF/Pub1617web1294055.pdf">http://www.pub.iaea.org/MTCD/Publications/PDF/Pub1617web1294055.pdf</a></p> <p>Radiation Oncology:          - Clinical Radiation Oncology (Fourth Edition) Leonard L. , Gunderson and Joel E. Tepper ISBN: 978-0-323-24098-</p>
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<b>EXAM METHOD</b>	Oral examination on the entire program.
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## EXAM COMMISSION

The Coordinator, full Professors of the disciplines, Professors of similar disciplines, Specialists of the subject, compose the exam Commission of the Integrated Course.

Santoni Riccardo, President
Manenti Guglielmo
Gandini Roberto
Garaci Francesco
Chiaravalloti Agostino

## CONTACTS

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PREREQUISITES: Previous knowledge and competence in the following subjects:

Human Anatomy 1, Human Anatomy 2, Histology and Embryology, Physiology and Pathophysiology, General Pathology and Pathophysiology, Systematic Pathology 1 and 2, Neurophysiology.

The specific learning outcomes of the program are coherent with the general provisions of the Bologna Process and the specific provisions of EC Directive 2005/36/EC. They lie within the European Qualifications Framework (Dublin Descriptors) as follows:

### **1. Knowledge and Understanding**

- Assess the physiologic principles that govern the function of the main body systems and the alterations induced by functional and structural abnormalities.
- Describe the main aspects of general pathology and explain the physiopathologic mechanisms underlying the concept of benign and malignant disorders as well as reversible and irreversible cellular damage
- Demonstrate knowledge about the mechanism of cell cycle maintenance and regulation; the factors affecting it and their consequences.
- Understand the core principles of acute and chronic inflammation in relation to the molecular, systemic and clinical aspects.
- Relate the general principles, terminology, and modes of spread of disease to the study of Systemic Pathology and the ways in which pathology contributes to the understanding of patient presentation in a clinical setting
- Focus on each organ and describe the pathogenesis of the main disease.
- Correlate basic disease states studied at a cellular and gross anatomical level with the overt clinical signs and symptoms seen in those disorders.
- Learn to interpret appropriate laboratory and diagnostic studies.

### **2. Applying Knowledge and Understanding**

- Apply the diagnostic procedure in pathology, through introduction of the differential diagnostic methods at the clinical level.
- Apply a basic understanding of histopathology and morbid anatomy to the examination of microscopic sections and gross specimens, respectively, displaying pathological processes.
- Provide a differential diagnosis based on specific clinical data, providing a comprehensive explanation of the underlying reasoning.
- Learn the practical aspects of the pathologic diagnostic instruments, when to use them and how to perform them.

### **3. Making Judgements**

- Recognize the importance of an in-depth knowledge of the topics consistent with a proper medical education.
- Identify the fundamental role of a proper theoretical knowledge of the subject in the clinical practice.

### **4. Communication Skills**

- Present the topics orally in an organized and consistent manner.
- Use of proper scientific language coherent with the topic of discussion.

## 5. Learning Skills

- Identify the possible use of the acknowledged skills in the future career.
- Assess the importance of the acquired knowledge in the overall medical education process.