



# UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Biomedicina, Neuroscienze e Diagnostica avanzata		
ACADEMIC YEAR	2017/2018		
MASTER'S DEGREE (MSC)	MEDICINE AND SURGERY		
SUBJECT	IMAGE DIAGNOSTICS		
TYPE OF EDUCATIONAL ACTIVITY	B		
AMBIT	50411-Discipline radiologiche e radioterapiche		
CODE	02324		
SCIENTIFIC SECTOR(S)	MED/36		
HEAD PROFESSOR(S)	BRANCATELLI GIUSEPPE	Professore Ordinario	Univ. di PALERMO
	CARUSO GIUSEPPE	Professore Associato	Univ. di PALERMO
	MIDIRI MASSIMO	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)			
CREDITS	5		
INDIVIDUAL STUDY (Hrs)	75		
COURSE ACTIVITY (Hrs)	50		
PROPAEDEUTICAL SUBJECTS	13246 - SYSTEMATIC PATHOLOGY I - INTEGRATED COURSE 13248 - SYSTEMATIC PATHOLOGY II - INTEGRATED COURSE 13257 - SYSTEMATIC PATHOLOGY IV - INTEGRATED COURSE 13253 - SYSTEMATIC PATHOLOGY III - INTEGRATED COURSE		
MUTUALIZATION			
YEAR	4		
TERM (SEMESTER)	2° semester		
ATTENDANCE	Mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	<b>BRANCATELLI GIUSEPPE</b> Monday 10:00 11:00 UFFICIO 131 SECONDO PIANO SEZIONE SCIENZE RADIOLOGICHE  <b>CARUSO GIUSEPPE</b> Monday 14:00 15:00 Dipartimento Diagnostica per Immagini Policlinico Palermo Tuesday 13:00 14:00 Cefpas Caltanissetta  <b>MIDIRI MASSIMO</b> Monday 09:00 11:00 I piano, Sezione di Scienze Radiologiche, BIND, Università degli Studi di Palermo		

<b>PREREQUISITES</b>	The student must have knowledge in the field of physics, anatomy, physiology and pathology in order to understand the content and the learning objectives of the course.
<b>LEARNING OUTCOMES</b>	<p>1. KNOWLEDGE AND CAPACITY OF COMPREHENSION To learn the basics of the different diagnostic methods for images. To understand the biological effects of ionizing radiation. To know the possibilities and limits, indications, contraindications and risks of the various methods of investigation. To keep elementary knowledge on radiologic semeiology of the major pathologies with reference to different organs and apparatus. To have general notions on techniques and indications of interventional radiology, nuclear medicine and radiotherapy.</p> <p>2. CAPACITY TO APPLY KNOWLEDGE AND COMPREHENSION To know how to recognize the main normal anatomical structures for a conventional x-ray examination, ultrasound, computer tomography and magnetic resonance imaging. To be able to find epidemiological and clinical information before making the choice of the diagnostic test to be used. To keep adequate knowledge and understanding of the main imaging techniques. To be able to require the most appropriate diagnostic test in the different clinical scenarios, according to criteria that provide basic principles of cost benefit, radiation protection, land availability and invasiveness of diagnostic methods. To know how to apply the major integrated diagnostic algorithms for assessing the most serious or common clinical situations. To be able to choose the best strategies and tools to get a proper diagnosis and to properly use the therapeutic options offered by interventional radiology, nuclear medicine, and radiation therapy.</p> <p>3. AUTONOMY OF JUDGMENT To evaluate autonomously the professional issues related to the notions of the course; Ability to evaluate scientifically and autonomously the basic knowledge provided by the module; Ability to face general themes related to image diagnostics.</p> <p>4. COMMUNICATION SKILLS Ability to communicate and disseminate the notions acquired during the module in professional field with scientific / clinical methodology.</p> <p>5. LEARNING CAPACITIES The method used is to provide the student with the basic knowledge of the discipline with targeted insights useful for performing the functions of the profession of the medical doctor. The student will be able to independently learn any concepts, solutions and updates that may be required during his / her training and profession.</p>
<b>ASSESSMENT METHODS</b>	<p>Tests will take place through oral interview and / or written questionnaire. The oral test consists of a colloquium aimed at ensuring the possession of the skills and knowledge of disciplines provided by the course. The student will have to answer to at least two / three oral questions, on all parts of the program, with reference to the suggested texts. The evaluation is expressed in 30/30 with the following evaluation method:</p> <p>30-30 and laude: Excellent knowledge of the subject matter, excellent language skills, good analytical ability, the student is able to apply the knowledge to solve the problems proposed.</p> <p>26-29: Good knowledge of arguments, full language skills, the student is able to apply knowledge to solve the proposed problems.</p> <p>24-25: Basic knowledge of the main topics, discrete language ownership, with limited ability to apply knowledge to the problem.</p> <p>21-23: The student is not able to analyze the main subjects of the discipline but retains knowledge and satisfactory language property, poor ability to apply the acquired knowledge independently.</p> <p>18-20: Minimum knowledge of the main topics of the course and technical language, little or no ability to apply the acquired knowledge independently.</p> <p>Insufficient: the student does not have an acceptable knowledge of the contents of the topics covered in the course.</p> <p>In case of a written test, the questionnaire will consists of 60 questions with multiple possible answers, only one of which will be correct. Each correct answer will get 1 point, while answers not given will not cause any penalties. Whatever the modality of evaluation, the test will be aimed at ensuring the expected learning outcomes. The exam duration is 60 minutes.</p>
<b>EDUCATIONAL OBJECTIVES</b>	<p>Ability to use the theoretical knowledge in a practical context.</p> <p>To learn about the management of the workflow in radiology department.</p> <p>To display the way 'of execution of traditional radiology exams, ultrasound, CT, MRI.</p> <p>To view the reporting of traditional radiology exams, ultrasound, CT, MRI.</p> <p>To identify the key radiographic findings in the light of the report.</p> <p>To display image processing techniques in CT and MR.</p>
<b>TEACHING METHODS</b>	Lectures at the Department of Radiology - A.O.U.P. Paolo Giaccone.
<b>SUGGESTED BIBLIOGRAPHY</b>	Diagnostica per immagini e radioterapia di Cittadini Giorgio - Cittadini Giuseppe - Sardanelli Francesco

	Editore: EDRA – MASSON Genere: scienze mediche. medicina Argomento: diagnostica medica, radioterapia Edizione: VII 2015 Pagine: 1150 ISBN: 8821440001 ISBN-13: 9788821440007 Data pubblicazione: 2015
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## SYLLABUS

Hrs	Frontal teaching
4	PHYSICS OF RADIATION - TECHNIQUES AND METHODOLOGY - CONTRAST MEDIA -Properties 'and mode' of production of X-rays and ionizing radiation (electromagnetic and corpuscular). -Radiation Nonionizing: physical characteristics and applications in Diagnostic Imaging. -Principles Of image formation (analog and digital).
2	Contrast media: classification and characteristics; clinical applications; adverse reactions and related measures.
3	Computed tomography: principles.
3	Ultrasound: the physics of ultrasound and general notions on the equipment.
3	Magnetic resonance imaging: physical principles and general notions on the equipment.
2	Nuclear Medicine: physical principles and general notions on the equipment.
2	Vascular and Interventional Radiology: generality and major procedures.
4	Radiobiology and Radiotherapy -Interaction between ionizing radiation and matter. direct and indirect-action of ionizing radiation. -Distribution Of the dose over time (curves isoefficacia). -Radiosensibilita 'Cell and cell survival curves. -Effect Oxygen. -Agents Radiosensitizers and radioprotective. -Damage (Acute and chronic) to ionizing radiation. biological -Effects of non-ionizing radiation. -Principles Of the worker and patient radiation protection and regulatory references. Interstitial and intracavitary radiation therapy. Major radiotherapy equipments (with high energy and conventional energy).
3	IMAGING TECHNIQUES OF RESPIRATORY SYSTEM
3	IMAGING TECHNIQUES OF DIGESTIVE SYSTEM
3	IMAGING TECHNIQUES OF LIVER - BILIARY tract - pancreas - spleen
3	IMAGING TECHNIQUES OF Urinary system, genital system and adrenal glands
2	IMAGING TECHNIQUES OF THYROID - BREAST - SOFT PARTS
3	IMAGING TECHNIQUES OF OSTEOARTICULAR SYSTEM
2	IMAGING TECHNIQUES OF CARDIOVASCULAR, LYMPHATIC, AND HEMATOPOIETIC SYSTEMS
3	IMAGING TECHNIQUES OF NERVOUS SYSTEM
5	DEFINITION OF DIAGNOSTIC ALGORITHMS IN MORE COMMON DISEASES

<b>PREREQUISITES</b>	Knowledge of Human Anatomy ; Knowledge of Physiology and Pathophysiology ; Pathology knowledge
<b>LEARNING OUTCOMES</b>	<p>Knowledge and understanding</p> <p>At the end of the course, students will be able to learn about the functioning Hardware and clinicoapplicativo of different diagnostic technologies. will be able to know the characteristics of the different pathologies with semeiological a semantic knowledge of terminologies.</p> <p>Applying knowledge and understanding</p> <p>The knowledge gained will allow to properly direct the future allapplicazione professionals to correct diagnostic algorithms with a high ability to apply knowledge and understanding of the issues.</p> <p>Making judgments</p> <p>Each student will be able to recognize, starting from the clinic and from Radiological semiotics, the object of study diseases and to evaluate the different severity and prognosis with full autonomy in the management of problems diagnostic, with knowledge of the diagnostic algorithms.</p> <p>Communication skills</p> <p>The student will be able to interact with colleagues, on diseases, and will be able to express themselves in a detailed and comprehensive in the description, of the symptoms and signs, not to mention the ability to communicate with patients.</p> <p>Llearning ability</p> <p>Through lectures and discussions in the classroom with questions and answers "free" in classroom, will increase the ability to learn immediately, reserving the rote learning and study the need for purely doctrinal raise the cultural level of the student.</p>
<b>ASSESSMENT METHODS</b>	<p>It is made an oral test that has the task of dealing with different teaching chapters. They will be carried out at least three questions that will focus on physics and radiobiology, equipment and clinical applications starting from the symptom. They will be assessed the knowledge, the ability 'to link with other diseases / topics, the exhibition capacitadi synthesis and knowledge of the diagnostic algorithms.</p> <p>Criteria used for evaluation:</p> <p>Rating: Excellent; vote 30 to 30 cum laude; the student has excellent knowledge of the topics, excellent properties' of language, good capacity 'analytic, students and' able to apply knowledge to solve problems proposed.</p> <p>Rating: very good. 26-29 vote. The student demonstrates good command of the topics, full ownership 'of language, the student and' able to apply knowledge to solve problems proposed.</p> <p>Rating: Good. Rating: 24-25. The student demonstrates basic knowledge of the main topics, discreet property 'language, with limited ability' to independently apply the knowledge to the solution of the proposed problems</p> <p>Rating: satisfactory. Vote: 21 to 23: The student does not have full command of the main teaching subjects but it has the knowledge, satisfactory properties 'language, poor ability' to independently apply the knowledge acquired</p> <p>Rating: enough. Rating: 18-20. The student shows minimal basic knowledge of the main teaching and technical language issues, very little or no ability 'to independently apply the knowledge acquired</p> <p>Rating: Not enough: The student does not have an acceptable knowledge of the topics contained treated in teaching</p>
<b>EDUCATIONAL OBJECTIVES</b>	<p>The educational aims of the course are aimed at providing students with the necessary knowledge about the radiological semiotics of different diagnostic equipment (X-rays , ultrasound , CT, MRI , MN , PET ) , and their use in the clinical setting by following objective criteria and with the best cost benefit both the patient and the health care resources , respecting the clinical protocols and leveraging the clinical knowledge .</p> <p>They must also demonstrate knowledge of the diagnostic algorithms in surgical and medical conditions .</p> <p>They will be provided notions concerning the main radiation treatments the sources used .</p>
<b>TEACHING METHODS</b>	Lessons; practical exercises in the Radiology Department.
<b>SUGGESTED BIBLIOGRAPHY</b>	<p>Diagnostica per immagini e radioterapia di Cittadini Giorgio - Cittadini Giuseppe - Sardanelli Francesco</p> <p>Editore: EDRA – MASSON</p> <p>Genere: scienze mediche. medicina</p> <p>Argomento: diagnostica medica, radioterapia</p> <p>Edizione: VII 2015</p> <p>Pagine: 1150</p> <p>ISBN: 8821440001</p> <p>ISBN-13: 9788821440007</p> <p>Data pubblicazione: 2015</p> <p>Passariello – Simonetti Idelson Gnocchi</p>

## SYLLABUS

Hrs	Frontal teaching
3	General concepts of atomic physics
2	Radiation physics
3	Interaction of radiation with matter
3	Radiobiology
1	effects of radiation on humans
8	X-ray equipment and image formation in ultrasound traditional radiology multislice CT, MR
4	radiological examination of the central and peripheral nervous system
2	endocrine glands
2	pulmonary tract
4	heart and vessels
2	digestive
4	liver and spleen
2	pancreas
3	urinary
1	lymphatic
2	muscle and skeletal
2	Principles of conformal radiotherapy
1	Brachytherapy
1	linear accelerator

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