UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Biomedicina, Neuroscienze e Diagnostica avanzata		
ACADEMIC YEAR	2018/2019		
BACHELOR'S DEGREE (BSC)	MEDICAL AND IMAGE DIAGNOSTICS AND RADIOTHERAPY TECHNIQUES		
INTEGRATED COURSE	IMAGE DIAGNOSTICS TECHNIQUES 3 - INTEGRATED COURSE		
CODE	07248		
MODULES	Yes		
NUMBER OF MODULES	3		
SCIENTIFIC SECTOR(S)	MED/36		
HEAD PROFESSOR(S)	BRANCATELLI GIUSEPPE	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)	BRANCATELLI GIUSEPPE	Professore Ordinario	Univ. di PALERMO
	LO CASTO ANTONIO	Professore Associato	Univ. di PALERMO
	BARTOLOTTA TOMMASO VINCENZO	Professore Ordinario	Univ. di PALERMO
CREDITS	9		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	3		
TERM (SEMESTER)	1° semester		
ATTENDANCE	Mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	**BARTOLOTTA TOMMASO VINCENZO**		
	Monday 09:00 12:00 Istituto di Radiologia- Policlinico Universitario di Palermo		
	BRANCATELLI GIUSEPPE		
	Monday 10:00 11:00 UFFICIO 131 SECONDO PIANO SEZIONE SCIENZE RADIOLOGICHE		
	LO CASTO ANTONIO		
	Monday 9:00 11:00 I piano, Sezione Scienze radiologiche, DIBIMED		

PREREQUISITES	The student must have knowledge in the field of physics and anatomy in order to understand the content and the learning objectives of the course.
LEARNING OUTCOMES	Knowledge and ability to understand: the student will demonstrate knowledge and understanding skills regarding computed tomography and magnetic resonance techniques of the whole body. This knowledge will be acquired through lectures and practical sessions. Ability to apply knowledge and understanding: At the end of the course the student will be able to apply knowledge in practice, have understanding abilities and be able to solve problems regarding computed tomography and magnetic resonance techniques of the whole body, in order to achieve excellent technical abilities suitable in light of the complexity of the care and the health of the population. Independent reasoning: At the end of the course the student will be able to integrate knowledge and manage complexity, as well as to formulate assessments on the basis of limited or incomplete information, including considerations on the social and ethical responsibilities related to the application of his/her knowledge, and assessments regarding the applications of computed tomography and magnetic resonance techniques of the whole body. Communication skills: At the end of the course the student will know how to communicate in a clear and unequivocal way his / her conclusions, as well as the knowledge and underlying reasoning, to specialists and non-specialist interlocutors regarding the applications of computed tomography and magnetic resonance of the whole body. These skills will be acquired and verified through meetings with patients, tutors and assistants, promoting active involvement of students. Learning skills: At the end of the course the student will have developed those learning skills that allow to continue to study in an autonomous way. These skills will be developed through the percentage of time dedicated to autonomous learning, encouraging reflection activities and elaboration of issues regarding the applications of computed tomography and magnetic resonance techniques of the whole body. Evaluation of learning skills can be carried out through the elaboration of general reports or presentations with the help of the teaching staff.
ASSESSMENT METHODS	The oral test consists of a colloquium aimed at ensuring the possession of the skills and knowledge of the disciplines provided by the course. The student will have to answer to at least two / three oral questions, on all the parts of the program, with reference to the suggested texts. The evaluation is expressed in the following way: 30-30 and merit: Excellent knowledge of subjects, excellent language skills, good analytical ability, the student is able to apply knowledge to solve the proposed problems. 26-29: Good knowledge of subjects, full language skills, the student is able to apply the knowledge to solve the proposed problems. 24-25: Basic knowledge of the main topics, discrete language properties, with limited ability to apply knowledge to the problem solving themselves. 21-23: The student is not fully mastered in the main subjects of the teaching but possesses knowledge, satisfactory language property, poor ability to apply the acquired knowledge independently. 18-20: minimum basic knowledge of the main topics of the teaching and technical language, little or no ability to independently apply the acquired knowledge. Insufficient: the student does not have an acceptable knowledge of the contents of the topics covered in the teaching.
TEACHING METHODS	Lessons at DIBIMED (III floor).

MODULE
IMAGE DIAGNOSTICS, IMAGE DIAGNOSTICS TECHNIQUES III

Prof. ANTONIO LO CASTO

SUGGESTED BIBLIOGRAPHY

Protocolli per TC multidetettore elaborati per apparecchiature GE. Springer-Verlag Italia, Milano, 2006. Protocolli per TC multidetettore elaborati per apparecchiature Siemens. Springer-Verlag Italia, Milano, 2006. Protocolli per TC multidetettore elaborati per apparecchiature Philips. Springer-Verlag Italia, Milano, 2006. Passariello R. Idelson Gnocchi, Napoli, 2005. Baert AL, SartorK.Multislice CT. Springer-Verlag, Berlin Heidelberg New York, 2004.http://www.ctisus.com/

AMBIT	10342-Scienze e tecniche di radiologia medica per immagini e radioterapia
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30

EDUCATIONAL OBJECTIVES OF THE MODULE

To teach the student the bases for the comprehension of the methodology to elaborate and perform different CT study protocols in diverse body regions, starting from preliminary information on CT device technology, CT image formation and reformation, and contrast administration methods.
At the end of the course the student should know the different possibilities and applications of computed tomography with respect to conventional radiology techniques, diverse features and performances of multirow volumetric and cone beam CT devices, CT study indications and CT study protocols for diverse body regions.

SYLLABUS

Hrs	Frontal teaching
2	Technology evolution and technical features of computed tomography (CT) devices: from the beginning to multirow volumetric and cone beam CT.
2	Functioning principles of CT devices and computed tomography image formation in comparison with conventional radiology and tomography.
3	Parameters influencing CT image quality.
3	Contrast medium administration in CT. Bi- and tridimensional reformation techniques of CT images: MPR, CPR, MIP MinIP, VR, virtual endoscopy.
4	CT study protocols for different body regions and volumetric CT devices.
2	CT study protocols for the maxillofacial region, jaws, paranasal sinuses.
2	CT study protocols for the neck.
2	CT study protocols for the chest including high resolution one (HRCT).
2	CT study protocols for the abdomen, liver, pancreas, adrenals.
2	CT study protocols for the gastrointestinal tract.
2	CT study protocols for the urinary tract.
2	CT study protocols for the pelvis.
2	Angio-CT study protocols.

MODULE
IMAGE DIAGNOSTICS, IMAGE DIAGNOSTIC TECHNIQUES V

Prof. GIUSEPPE BRANCATELLI

SUGGESTED BIBLIOGRAPHY

GIOVAGNORIO – Manuale di Diagnostica per Immagini nella Pratica Medica
Autore: F. Giovagnorio
II Ed.2017 19×26,5 Hardcover Pag.320 a colori
ISBN: 9788874889990

AMBIT	10342-Scienze e tecniche di radiologia medica per immagini e radioterapia
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30

EDUCATIONAL OBJECTIVES OF THE MODULE

PREREQUISITITES
Anatomy of the central nervous system and of the main solid organs of the abdomen.

TOPICS OF THE MODULE
To learn the main diagnostic techniques (x-rays,ultrasonography, computed tomography, magnetic resonance) and the terminology utilized in daily practice. To learn how to interpret a radiology report. TO correlate the symptoms and signs with the imaging findings.

LEARNING OBJECTIVES
To know the main imaging techniques along with the terminology used in radiology. To list indications and contraindications. To familiarize how to analyze and recognize the images produced with the different imaging techniques. To undertand the radiology reports when observing diagnostic images. To recognize the common disease described in the radiology reports, and their evolution both towards healing and degeneration.

DIDACTIC METHODS
Formal lessons delivered by the teacher along with presentations delivered by the students ("flipped classroom")

EVALUATIONS METHODS
Evaluation of the organizational capacity, presentation mode, completeness of information, appropriateness, use of adequate professional scientific language and student self-study when preparing a powerpoint presentation during seminar activities (up to a maximum of 10/30). Final written test with multiple choice questions (up to a maximum of 20/30). For each question, 4 possible options will be presented, and the exact answer will be only one. The score is calculated by assigning 1 point to each correct answer, 0 points for noresponse, and -0.25 for the wrong answer. The test is passed with score ≥ 18. No oral examination will be possible if the written test is not passed. The final vote will be based on a scale of 30/30.

SYLLABUS

Hrs	Frontal teaching
4	X-rays
4	How to interpret a radiology report
6	Radiologic anatomy of the skeletal system and of the central nervous system

Hrs	Others
4	Conventional radiology
4	Computer tomography
4	Ultrasonography
4	Magnetic resonance imaging

MODULE
IMAGE DIAGNOSTICS, IMAGE DIAGNOSTICS TECHNIQUES IV

Prof. TOMMASO VINCENZO BARTOLOTTA

SUGGESTED BIBLIOGRAPHY	
Moeller TB, Reif E. MRI parameters and positioning. CIC Edizioni Internazionali, Roma 2004.	
AMBIT	10342-Scienze e tecniche di radiologia medica per immagini e radioterapia
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30

EDUCATIONAL OBJECTIVES OF THE MODULE

The educational objective of this module is the transmission of knowledge of the various operational protocols in magnetic resonance imaging. Specific objective is to understand the physical and mathematical basic principles that underlie the development of individual sequences used in the different study protocols for magnetic resonance imaging. The latter includes the sequences used in their constitutive parameters.

The oral test consists of a colloquium aimed at ensuring the possession of the skills and knowledge of the disciplines provided by the course. The student will have to answer to at least two / three oral questions, on all the parts of the program, with reference to the suggested texts. The evaluation is expressed in the following way: 30-30 and merit: Excellent knowledge of subjects, excellent language skills, good analytical ability, the student is able to apply knowledge to solve the proposed problems. 26-29: Good knowledge of subjects, full language skills, the student is able to apply the knowledge to solve the proposed problems. 24-25: Basic knowledge of the main topics, discrete language properties, with limited ability to apply knowledge to the problem solving themselves. 21-23: The student is not fully mastered in the main subjects of the teaching but possesses knowledge, satisfactory language property, poor ability to apply the acquired knowledge independently. 18-20: minimum basic knowledge of the main topics of the teaching and technical language, little or no ability to independently apply the acquired knowledge. Insufficient: the student does not have an acceptable knowledge of the contents of the topics covered in the teaching.

SYLLABUS

Hrs	Frontal teaching
6	Physical and mathematical basis of the MR signal.
2	Liver protocols.
3	Brain protocols.
3	Spinal cord protocols.
3	Functional Neuro MRI.
5	Cardiac protocols.
2	Musculoskeletal protocols.