UNIVERSITÀ DI PAVIA

Anno Accademico 2017/2018

DIAGNOSTIC TECHNIQUES I

Enrollment year	2016/2017
Academic year	2017/2018
Regulations	DM270
Academic discipline	FIS/07 (APPLIED PHYSICS (CULTURAL HERITAGE, ENVIRONMENT, BIOLOGY AND MEDICINE))
Department	DEPARTMENT OF PHYSICS
Course	
Curriculum	Fisica biosanitaria
Year of study	2°
Period	2nd semester (01/03/2018 - 15/06/2018)
ECTS	6
Lesson hours	48 lesson hours
Language	Italian
Activity type	ORAL TEST
Teacher	ALTIERI SAVERIO (titolare) - 6 ECTS
Prerequisites	Radioactivity Atomic and Nuclear Structur Interaction of radiation with matter Radiation detectors
Learning outcomes	Learning of physical principle used in the clinical diagnostic techniques based on ionizing radiation
Course contents	The course deals with the physical bases of clinical dignostic techniques that uses ionizing radiations; imagng modalities and related detectors. Main topics are: medical imaging charachteristics as contrast, spatial resolution, Point Spread Function (PSF), Line Spread Function (LSF), Edge Spread Function (ESF), Convolution, Modulation Transfer Function (MTF), Noise, Contrast to Noise ratio, Signal to noise ratio, (SNR), Detective Quantum Efficiency (DQE). X-ray produuction,

	radiography, analogue receptors, Computed radiography and related detectors (CCD, Flat Panels, Thin Film Transistor Array Detectros). Mammography, Fluoroscopy, Computed Tomography. Imaging by radioisotopes; radioisotopes and radiopharmaceutical production. Scintillation camera. SPECT, PET; combined modalities (SPECT/CT, PET/CT).
Teaching methods	Presentation and comments of projected slides; possibility for students to ask questions and discuss specific topics during the lecture. Are foreseen specialized seminars and visit to department of radiology and nuclear medicine
Reccomended or required readings	Jerrold T. Bushberg, J. Anthony Seibert, Edwin M. Leidholdt Jr., John M. Boone-The Essential Physics of Medical Imaging - Edited by Lippincott Williams & Wilkins - Third Edition (2012) ISBN 978-0-7817-8057-5; Webb's Physics of Medical imaging - Edited by M A Flower - Second edition (2012) ISBN 9781466568952 Farr's Physics for Medical Imaging. P Allisy-Roberts, J Williams – Edited by Saunders - Elsevier, Second Edition (2008) - ISBN 9870702028441
Assessment methods	Oral examination to verify the competence and skills reached by the student. The discussion will be focused on physical aspects rather than on a detailed mathematical derivations.
Further information	
Sustainable development goals - Agenda 2030	$lbl_legenda_sviluppo_sostenibile