UCLouvain

wrdgn3120

2026

Methods, techniques and quality controle in medical imaging

3.00 credits	25.0 h + 5.0 h	Q2

Teacher(s)	Duchêne Gaëtan ;Jamar François ;Lhommel Renaud ;Michoux Nicolas (coordinator) ;Pasoglou Vassiliki ;
Language :	French
Place of the course	Bruxelles Woluwe
Main themes	Content: this annual course focuses on the techniques and use of different imaging methods in Radiology and Nuclear Medicine. Method: virtual course based on the book "Guide to Medical Imaging and Radiotherapy Technologies (Ed. Masson, JP Dillenseger, E. Moerschel)" and supplemented by documents available on the website (RDGN3120).
Learning outcomes	
Evaluation methods	Physicists : critical analysis of a scientific paper (50%) + MCQ test (50%) Physicians & MACCS : MCQ test The exam takes place in June (1st session) and in August/september (2nd session).
Teaching methods	Web-based course based on the reading of the book "Guide des Technologies de l'Imagerie Médicale et de la Radiothérapie" (Elsevier Masson, 3rd edition, 2024: https://www.elsevier-masson.fr/guide-des-technologies-de-limagerie-medicale-et-de-la-radiotherapie-9782294783173.html) as well as on the reading of supplementary documents about medical imaging (more about the physics, the new imaging sequences and the artifacts), written by the teachers. These supplementary files (in powerpoint or pdf format) may be downloaded from the MOODLE web-site of the UCL at the following address: Although Magnetic Resonance Imaging (MRI) and Ultrasound (US) are described in the book as well as in the additionnal documents on the moodle website, these 2 imaging techniques are not covered in the final examination. However, it is strongly advised to read the associated chapters in the book in order to improve his/her knowledge in medical imaging. Likewise, it is strongly advised that students interact with each other and with teachers with the same aim to improve his/her knowledge in medical imaging. https://moodle.uclouvain.be/course/view.php?id=4595
Content	Principles (Physics & Technology) in medical imaging - from image digitization to image post-processing - physics of ionizing radiation - radiology of projection - technology and practical use of conventional Xrays (Computed Tomography), and nuclear medicine (including Positron Emission Tomography). - characteristics of contrast agents (used in Nuclear Medicine) - Accidents related to radiological procedures - artifacts in imaging - quality control (qualitative and quantitative assessment of imaging systems) Requirement ! Physics students must have validated the course LGBIO2050 before attending the course WRDGN3120.
Inline resources	https://moodle.uclouvain.be/course/view.php?id=4595
Bibliography	Guide des technologies de l'imagerie médicale et de la Radiothérapie (Ed. Masson, JP Dillenseger, 3ed, 2024: https://www.elsevier-masson.fr/guide-des-technologies-de-limagerie-medicale-et-de-la-radiotherapie-9782294783173.html).
Other infos	Examination consisting in multiple choice questions, concordance, open question, sequencing
Faculty or entity in charge	MED

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Certificat de compétence pour l'utilisation des rayons X en diagnostic médical	RXU2CE	3		
Advanced Master in Nuclear Medicine	MNUC2MC	2		
Certificat universitaire en physique d'hôpital	RPHY9CE	3		