UCLouvain

wrdth3120

2020

Due to the COVID-19 crisis, the information below is subject to change, in particular that concerning the teaching mode (presential, distance or in a comodal or hybrid format).

3 credits	30.0 h	Q2

Teacher(s)	Sterpin Edmond ;
Language :	French
Place of the course	Bruxelles Woluwe
Main themes	A. INTRODUCTION - Definition of absorbed dose, KERMA and CEMA - Different types of ionizing beams used in radiotherapy B. INTERACTIONS WITH MATTER - Charged particles - Photons. - Neutrons. C. INTEGRATING DOSIMETRY DETECTORS - Calibration chain for dosimetry detectors - Calorimetry - Ionization Chambers. - Thermoluminescence. - Films. - Diodes. - Chemical dosimetry D. DETERMINATION OF THE ABSORBED DOSE IN A CLINICAL BEAM UNDER REFERENCE CONDITIONS - Calibration of an ion chamber in terms of Air-KERMA - Calibration of an ion chamber in terms of absorbed dose in water - Dosimetry recommendations based on Air-Kerma standards based on absorbed dose in water - Determination of the absorbed dose under non-reference conditions - Dosimetry audits E. INTRODUCTION TO RADIOTHERAPY TECHNIQUES
Aims	*The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Evaluation methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** The assessment is done entirely on the day of the exam. This consists of a written part and an oral part. The written part is done with open notebook and accounts for 80%. It consists of a theoretical part and exercises. The oral part (closed notebook) accounts for 20%.
Teaching methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** The course is essentially given in lecture format. However, students will have to present themselves parts of the course ("reverse teaching") to promote dynamic learning. 1 session of exercises is also scheduled. Finally, an evening will be devoted to illustrate the reference dosimetry on a device of the radiotherapy center of Saint-Luc University Clinics.
Content	This teaching unit consists in acquiring the theoretical and practical principles of radiotherapy dosimetry and quality assurance in order to train the medical physicist in his/her main missions in a radiotherapy center. Aspects specific to proton therapy are also discussed. The course is organized around six main themes: 1. The interactions of particles with matter from the point of view of the medical physicist working in a radiotherapy center 2. Cavity theory for the determination of the absorbed dose in the medium 3. The properties of the detectors typically used 4. Reference dosimetry for calibration of treatment units 5. Dosimetry of small fields 6. An introduction to quality assurance procedures
Inline resources	All slideshows and most appendices are on Moodle
Bibliography	• Tous les transparents disponibles sur moodle et dispensés lors des cours magistraux Les aspects théoriques sont couverts dans les références suivantes : • Handbook of Radiotherapy Physics (Mayles, Nahum, Rosenwald) • Les protocoles de dosimétrie IAEA TRS-398, IAEA TRS-483, AAPM TG-43U et AAPM TG-51 The physics of proton therapy (Neuwhauser and Zhang, Physics in Medicine and Biology 2015)
Other infos	Slideshows and media are in English. The preferred language for the course is French, but English can be considered on request.

Faculty or entity in charge	MED

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Advanced Master in Radiotherapy-Oncology	RDTH2MC	3		
Certificat universitaire en physique d'hôpital	RPHY9CE	3		
Master [120] in Physics	PHYS2M	3		
Master [120] in Biomedical Engineering	GBIO2M	3		