UCLouvain

lphys2504

2024

Use, management and control of radioelements

3.00 credits	22.5 h	Q2

Teacher(s)	Froment Pascal ;
Language :	English
Place of the course	Louvain-la-Neuve
Prerequisites	No prerequisite for students who have obtained a Bachelor's degree in physics and who therefore already have a basic knowledge of nuclear physics, experimental methods and chemistry.
Main themes	Presentation of practical applications of radioisotopes in industrial and medical environments. All aspects of on-site radio management : production, packaging, transport, implementation and disposal for various applications.
Learning outcomes	**At the end of this learning unit, the student is able to :** 1 **a. Contribution of the teaching unit to the learning outcomes of the programme (PHYS2M)** 1.2, 1.3, 2.2, 2.5, 5.3, 9.1, 9.2, 9.3. **b. Specific learning outcomes of the teaching unit** At the end of this teaching unit, the student will be able to correctly manage the use of sources of ionizing radiation (radioactive sources and X-ray tubes) in a laboratory, a medical establishment or an industrial establishment.
Evaluation methods	The evaluation consists of a written examination consisting of about ten questions followed directly by a discussion with the teacher. Complementary questions make it possible to specify the answers given at the written exam
Teaching methods	Teaching activities will be provided by the holder of the teaching unit. The concrete examples are adapted to the questions and wishes of the students.
Content	All aspects of on-site radio management: production, packaging, transport, implementation and disposal for various applications. 1. Reminder of fundamental principles of nuclear physics 2. Production of artificial radioisotopes : nuclear reactor cyclotron 3. Packaging and transport of radioisotopes: packages, packaging 4. Establishment authorizations 5. Design of a controlled area : armor calculation, rules of good practice in the zone 6. Medical applications and industrial applications : industrial gauges, radiosterilization, gamma radiography, tracers, radiotherapy, nuclear medicine (each type of use is detailed and illustrated) 7. Disposal of radioactive waste The teaching unit contains many current and concrete examples. These examples are chosen according to the orientation chosen by the students.
Bibliography	Des ouvrages en relation avec les disciplines seront présentés lors des cours. Books related to the disciplines addressed will be presented during the theoretical lectures.
Faculty or entity in charge	PHYS

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Biomedical Engineering	GBIO2M	3		
Certificat universitaire en physique d'hôpital	RPHY9CE	3		
Certificat universitaire en radioprotection pour les médecins du travail	RMDT9CE	3		
Master [120] in Physics [professional focus of Medical Physics : UCLouvain-KULeuven]	PHYS2M	3		
Master [120] in Medical Physics	PHMD2M	3		