

3.00 credits

Q1

Language :	English
Place of the course	Autre site
Prerequisites	Bachelor level lectures on physics, mechanics, mathematics.
Learning outcomes	At the end of this learning unit, the student is able to : - To learn and understand the basic properties of a nucleus - To understand the role of conservation laws in decay processes and reactions - To learn particles interactions with matter - To learn characteristics of main particles detectors
Evaluation methods	Written examination (closed book)
Teaching methods	2 t.m. ; 36 hours of lectures, 5 lab sessions of ½ day - laboratory work (SCK.CEN)
Content	- Nuclear properties (nuclear radius; mass and abundance of nuclides; nuclear binding energy; nuclear excited states) - Radioactive decay law, radioactive chains, units of radioactivity - Alpha, Beta and Gamma decay - Nuclear fission - Types of nuclear reactions: compound nucleus, threshold reactions, concept of cross section - Interactions of ionizing radiations (ions, electrons, photons, neutrons) with matter - Detection of ionizing radiations (ions, electrons, photons, neutrons)
Inline resources	https://www.sckcen.be/fbnen
Bibliography	The PowerPoint presentations of the lectures are available on the BNEN website. Other useful references: Krane, K.S. 'Introductory Nuclear Physics', Wiley, 1987. Tavernier, S. 'Experimental techniques in nuclear and particle physics', Springer-Verlag, 2010. Knoll, G.F. 'Radiation detection and measurement', 4 ed., Wiley, 2010.
Other infos	Prof. Nicolas Pauly Université Libre de Bruxelles Course location: SCK-Cen (Mol)
Faculty or entity in charge	EPL

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Mechanical Engineering	MECA2M	3		
Master [120] in Electro-mechanical Engineering	ELME2M	3		
Master [120] in Energy Engineering	NRGY2M	3		