



3 credits

Q1

Language :	English
Place of the course	Autre site
Aims	<p>1</p> <ul style="list-style-type: none"> • 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 <p>-----</p> <p><i>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".</i></p>
Evaluation methods	Written examination (closed book)
Teaching methods	<ul style="list-style-type: none"> • 2 t.m. ; 36 hours of lectures, 5 lab sessions of ½ day • laboratory work (SCK.CEN)
Content	<ul style="list-style-type: none"> • 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	<p>The PowerPoint presentations of the lectures are available on the BNEN website.</p> <p>Other useful references:</p> <p>Krane, K.S. 'Introductory Nuclear Physics', Wiley, 1987.</p> <p>Tavernier, S. 'Experimental techniques in nuclear and particle physics', Springer-Verlag, 2010.</p> <p>Knoll, G.F. 'Radiation detection and measurement', 4 ed., Wiley, 2010.</p>
Other infos	<p>Prof. Nicolas Pauly Université Libre de Bruxelles</p> <p>Course location: SCK-Cen (Mol)</p>
Faculty or entity in charge	EPL

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Electro-mechanical Engineering	ELME2M	3		
Master [120] in Mechanical Engineering	MECA2M	3		
Specialised master in nuclear engineering	GNUC2MC	3		