



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

Q1

Language :	English
Place of the course	Autre site
Aims	<p>1</p> <ul style="list-style-type: none"> <li>• To learn and understand the basic properties of a nucleus</li> <li>• To understand the role of conservation laws in decay processes and reactions</li> <li>• To learn particles interactions with matter</li> <li>• To learn characteristics of main particles detectors</li> </ul> <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	<p><b>Due to the COVID-19 crisis, the information in this section is particularly likely to change.</b></p> <p>Written examination (closed book)</p>
Teaching methods	<p><b>Due to the COVID-19 crisis, the information in this section is particularly likely to change.</b></p> <ul style="list-style-type: none"> <li>• 2 t.m. ; 36 hours of lectures, 5 lab sessions of ½ day</li> <li>• laboratory work (SCK.CEN)</li> </ul>
Content	<ul style="list-style-type: none"> <li>• Nuclear properties (nuclear radius; mass and abundance of nuclides; nuclear binding energy; nuclear excited states)</li> <li>• Radioactive decay law, radioactive chains, units of radioactivity</li> <li>• Alpha, Beta and Gamma decay</li> <li>• Nuclear fission</li> <li>• Types of nuclear reactions: compound nucleus, threshold reactions, concept of cross section</li> <li>• Interactions of ionizing radiations (ions, electrons, photons, neutrons) with matter</li> <li>• Detection of ionizing radiations (ions, electrons, photons, neutrons)</li> </ul>
Inline resources	<a href="https://www.sckcen.be/fbnen">https://www.sckcen.be/fbnen</a>
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

<b>Programmes containing this learning unit (UE)</b>				
Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Electro-mechanical Engineering	<a href="#">ELME2M</a>	3		
Advanced Master in Nuclear Engineering	<a href="#">GNUC2MC</a>	3		
Master [120] in Mechanical Engineering	<a href="#">MECA2M</a>	3		