

In view of the health context linked to the spread of the coronavirus, the methods of organisation and evaluation of the learning units could be adapted in different situations; these possible new methods have been - or will be - communicated by the teachers to the students.

3 credits		Q1
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Language :	English
Place of the course	Autre site
Aims	<p>1</p> <ul style="list-style-type: none"> • To give a first overview of nuclear electricity generation and an overall introduction to reactor and plant engineering • To place the world and the Belgian nuclear energy production in its economic, social, technical and cultural context <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>Due to the COVID-19 crisis, the information in this section is particularly likely to change.</p> <p>Open book preparation of two or three (generally overview) questions. Students can take notes during the 30 min preparation. Students will then be interrogated orally (whereby they can use the just made notes if they wish) to check whether they have thoroughly understood the study material. Questions are oriented towards understanding and insight; marks are given for the performance during the oral examination (lasting 30 mins); not for the written preparation.</p>
Content	<ul style="list-style-type: none"> • Elementary aspects (first acquaintance) with practical nuclear physics and interaction of radiation with matter. • Birds-eye view of nuclear power generation: principle of generating electricity by nuclear means (fission; chain reaction; heat transfer to coolant; turbine; alternator); fissile & fertile materials; burn up; production of fission products; breeding; current types of power plants (PWR, BWR,'); future types of power plants (LWR-type, gas cooled, ADS, '); introduction to the fuel cycle; front end, back end; introduction to safety aspects of nuclear reactors (criticality; core melt); engineered safety systems; risk; difference with research reactors & fusion reactors; proliferation issues & safeguards • Economics of nuclear power generation: cost of nuclear kWh; investment costs of new types NPP's; construction time; decommissioning costs; internalisation of waste management; external costs • Compatibility of nuclear power generation with sustainable development. Public perception & communication (media, general public, public authorities).
Faculty or entity in charge	EPL

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Advanced Master in Nuclear Engineering	GNUC2MC	3		