

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.

10 credits	52.5 h + 7.5 h	Q1
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Teacher(s)	Bruno Giacomo ;Lemaitre Vincent ;Piotrkowski Krzysztof ;
Language :	English
Place of the course	Louvain-la-Neuve
Main themes	Principles and applications of particle acceleration - Accelerator physics - Neutrino physics - Dark matter - Precision measurements at low energies - Gravitational waves ' Cosmic microwave background ' Radio-telescopes.
Aims	<p>a. Contribution of the teaching unit to the learning outcomes of the programme (PHYS2M) 1.2,1.3,1.4, 1.6, 2.1,3.1, 3.3, 3.4, 4.1, 4.2, 5.1, 5.2, 5.3, 5.4, 7.1, 7.2, 7.3, 7.5, 8.1.</p> <p>b. Specific learning outcomes of the teaching unit At the end of this teaching unit, the student will be able to :</p> <ol style="list-style-type: none"> 1. explain and discuss in detail the advanced experiments that have been setup in fundamental interactions physics ; 2. write a report that documents an experiment in physics of the fundamental interactions ; 3. link theoretical concepts to their manifestation in real environments ; 4. analyse the sources of uncertainty about an experimental measurement and evaluate their impact on the scientific conclusions of an experiment. <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. Evaluation of a personal project report. Oral exam, partly based on the project report.</p>
Teaching methods	<p>Due to the COVID-19 crisis, the information in this section is particularly likely to change. Lectures in class. Integrative personal project, whose subject is left to the student's choice. Reading portfolio for personal study.</p>
Content	Principles of particle acceleration. Underlying physics and experiment description for the following subjects : Higgs boson, top quark and beyond-the-Standard Model physics (LHC collider) - Flavour physics (experiments at B-factories and NA62) - Neutrino physics - Dark matter - Precision measurements at low energies (e.g. muon g-2, electron EDM,...) - Gravitational waves – Cosmic microwave background – Radio-telescopes.
Bibliography	<p>Des diapositives de cours et des documents supplémentaires sur les sujets traités sont disponibles sur le site MoodleUCL de l'unité d'enseignement.</p> <p>Course slides and additional documents on the subjects addressed are available on the MoodleUCL website of the teaching unit.</p>
Faculty or entity in charge	PHYS

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Physics	PHYS2M	10		