UCLouvain

lphys2336

2020

Advanced experimental aspects of fundamental interactions

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).

10 credits	52.5 h + 7.5 h	Q1

Teacher(s)	Bruno Giacomo ;Lemaitre Vincent ;Piotrzkowski 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	**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. **b. Specific learning outcomes of the teaching unit** At the end of this teaching unit, the student will be able to : 1 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. - - - - *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".*
Evaluation methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** Evaluation of personal projects reports. Oral exam, partly based on the projects reports.
Teaching methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** Lectures in class. Integrative personal projects, whose subjects are left to the student's choice. Reading portfolio for personal study.
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	Des diapositives de cours et des documents supplémentaires sur les sujets traités sont disponibles sur le site MoodleUCL de l'unité d'enseignement. Course slides and additional documents on the subjects addressed are available on the MoodleUCL website of the teaching unit.
Other infos	Following the sanitary conditions, the modalities of the teaching AND the examination could be reassessed according to the situation and the rules in force.
Faculty or entity in charge	PHYS

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