

10.00 credits

52.5 h + 7.5 h

Q1

Teacher(s)	Bruno Giacomo ;Cortina Gil Eduardo ;de Wasseige Gwenhaël ;Lemaitre Vincent ;
Language :	English > French-friendly
Place of the course	Louvain-la-Neuve
Prerequisites	LPHYS2131
Main themes	PARTIM A (5 credits) : Principles and applications of particle acceleration - Accelerator physics - Precision measurements at low energies - Neutrino physics. This partim can be taken separately. PARTIM B (5 credits) : Particles and radiation of cosmic origin (including neutrinos) – Gravitational waves. This partim can be taken separately.
Learning outcomes	<p>At the end of this learning unit, the student is able to :</p> <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.
Evaluation methods	Evaluation of personal projects reports. Oral exam, partly based on the projects reports.
Teaching methods	Lectures in class. Personal projects. Students can choose the subject among a list proposed by the teachers. Reading portfolio for personal study.
Content	PARTIM A (5 credits; can be taken separately) : 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 - Precision measurements at low energies (e.g. muon g-2, electron EDM,...) PARTIM B (5 credits; can be taken separately) : Theory, instrumentation and data analysis methods used in astroparticle physics and gravitational wave physics.
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	Learning outcomes
Master [120] in Physics	PHYS2M	10		