UNIVERSITÀ DI PAVIA

Anno Accademico 2017/2018

ELEMENTARY PARTICLE PHYSICS I

Enrollment year	2016/2017
Academic year	2017/2018
Regulations	DM270
Academic discipline	FIS/04 (NUCLEAR AND SUBNUCLEAR PHYSICS)
Department	DEPARTMENT OF PHYSICS
Course	
Curriculum	Fisica nucleare e subnucleare
Year of study	2°
Period	1st semester (02/10/2017 - 19/01/2018)
ECTS	6
Lesson hours	48 lesson hours
Language	Italian or English upon request. The textbooks are in English.
Activity type	ORAL TEST
Teacher	BOCA GIANLUIGI (titolare) - 6 ECTS
Prerequisites	Three year Degree in Physics (in Pavia) or equivalent at other Universities; the students are strongly advised to follow before a class In Quantum Field Theory or equivalent.
Learning outcomes	Learning the experimental aspects of the physics of quarks, Higgs boson, neutrino
Course contents	In this class the dynamics of the fundamental particle interactions is shown quantitatively examining examples of lepton-lepton, lepton-hadron and hadron-hadron interactions within the Standard Model. In particular the production and decay of the W and Z bosons, the production of jets, the production of top and bottom quarks are explained. The modern current main experimental topics of the experimental particle physics (collider experiments, underground experiments) are then shown.

	In particular : a) Large Hadron Collider physics, in particular production and decay of the Higgs boson and supersymmetric particles; b) neutrino physics, fenomenology of the solar neutrino, atmospheric neutrino and accelerator and reactor produced neutrino oscillation.
Teaching methods	direct lesson with the aid of projected slides. Answers to the students' questions and discussions with them in order to asses at which extent they follow and understand the lesson.
Reccomended or required readings	a) C. Conta, Introduction to Modern Particle Physics, Pavia University Press, 2010. b) D. H. Perkins, Introduction to high energy physics, 1987, Addison-Wesley c) C. Conta, The Physics at the Large Hadron Collider, FNT/DD 2009 d) C. Conta, Neutrino oscillations, FNT/DD 2009
Assessment methods	Oral exam in order to asses the student's knowledge of the basic concept in particle physics, of the most important experiments that tested them and the experimental techniques used.
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Sustainable development goals - Agenda 2030	$lbl_legenda_sviluppo_sostenibile