UNIVERSITÀ DI PAVIA

Anno Accademico 2014/2015

STATISTICAL METHODS IN PHYSICS

Enrollment year	2013/2014
Academic year	2014/2015
Regulations	DM270
Academic discipline	FIS/01 (EXPERIMENTAL PHYSICS)
Department	DEPARTMENT OF PHYSICS
Course	
Curriculum	FISICA NUCLEARE E SUBNUCLEARE
Year of study	2°
Period	1st semester (13/10/2014 - 23/01/2015)
ECTS	6
Lesson hours	48 lesson hours
Language	ITALIAN
Activity type	ORAL TEST
Teacher	PEDRONI PAOLO (titolare) - 6 ECTS
Prerequisites	Basic notions of statistics and probability theory.
Learning outcomes	Learning of the main statistical methods used in all the different physics disciplines for the interpretation, the simulation and the prediction of experimental data.
Course contents	Topics covered include: Multidimensional random variables and functions of random variables; Basic statistics (confidence intervals; estimates of probabilities; population mean and variance, correlation coefficients); Detailed treatment of the Monte Carlo methods with a discussion of its basic principles and first applications; Maximum likelihood method applied parameter estimation and hypothesis testing; Least squares method and its application to minimization (best-fit) algorithms.
Teaching methods	=

Reccomended or required readings	L.Lyons, Statistics for Nuclear and Particle Physcists (Cambridge University Press, 1986) A. Papoulis, Probability and Statistics, (Prentice Hal 1990) G.Cowan, Statistical Data analysis, (Oxford University Press 2002) F. James, Statistical Methods in Experimental Physics (World Scientific, 2006)
Assessment methods	Oral examination. For the examination it is recommended to focus on the conceptual and logical aspects of the covered topics and not on a detailed study of the mathematical derivations.
Further information	Oral examination. For the examination it is recommended to focus on the conceptual and logical aspects of the covered topics and not on a detailed study of the mathematical derivations.
Sustainable development goals - Agenda 2030	$lbl_legenda_sviluppo_sostenibile