UNIVERSITÀ DI PAVIA

Anno Accademico 2020/2021

INTRODUCTION TO MODERN PHYSICS

Enrollment year	2019/2020
Academic year	2020/2021
Regulations	DM270
Academic discipline	FIS/02 (THEORETICAL PHYSICS, MATHEMATICAL MODELS AND METHODS)
Department	DEPARTMENT OF PHYSICS
Course	PHYSICS
Curriculum	PERCORSO COMUNE
Year of study	2°
Period	2nd semester (01/03/2021 - 11/06/2021)
ECTS	6
Lesson hours	48 lesson hours
Language	Italian
Activity type	ORAL TEST
Teacher	MONTAGNA GUIDO (titolare) - 6 ECTS
Prerequisites	A good knowledge of the topics discussed in the courses Classical Mechanics, Electrodynamics and Thermodynamics.
Learning outcomes	The course is devoted to the analysis and interpretation of the phenomena which gave rise to the so-called crisis of classical physics and the birth of modern physics. An introduction to the main conceptual and theoretical aspects of (classical) Statistical Mechanics and Quantum Physics are also given. This provides a necessary background for a better prosecution of the studies for the Bachelor in Physics.
Course contents	Crisis of classical mechanics and electrodynamics in the light of the discovery of new phenomena at the beginning of the XX century (from blackbody radiation to quantum nature of light and wave-particle duality). Main conceptual and theoretical aspects of Statistical

	Mechanics and Quantum Physics of common use in modern physics. Discussion of quantum effects in simple examples of physics phenomena.
Teaching methods	Lectures aiming at providing all the conceptual and theoretical aspects related to the addressed topics. The key experiments highlighting the crisis of classical physics are discussed in detail.
Reccomended or required readings	B.H. Bransden, C.J. Joachain, Quantum Mechanics, Pearson, Prentice Hall. D. J. Griffiths, Introduction to Quantum Mechanics, Prentice Hall.
Assessment methods	Oral exam. The student will be asked to discuss and explain one of the phenomena of crisis of classical physics. He will have to show to be acquainted with the main conceptual aspects of Quantum Mechanics.
Further information	The course can be also chosen by students in Mathematics, who are interested to strengthen their preparation in modern physics.
Sustainable development goals - Agenda 2030	$lbl_legenda_sviluppo_sostenibile