


6.00 credits

40.0 h + 20.0 h

Q2

Teacher(s)	Degrande Céline ;Drewes Marco ;
Language :	French
Place of the course	Louvain-la-Neuve
Main themes	The course is divided into three parts. The first covers the mechanics of points and simple systems. After an initial kinematic study of movements, Newtonian principles are introduced, the basic concepts of impulsion, quantity of movement, work, energy and power, and the principle of energy conservation. Within a systems dynamics framework, collisions and rotations of rigid bodies are investigated, introducing the concepts of moment of force and kinetic moment. These various concepts will be applied to the study of oscillating motion, simple oscillating systems and harmonic oscillation, the simple pendulum and gravitation. This part ends in an introduction to fluid mechanics and the laws of gases. The second part introduces wave physics (mechanical and sound waves) and demonstrates some specific properties like the Doppler effect, interference and diffraction. The last part deals with modern Physics, highlighting the contribution of restricted relativity and quantum Physics to our understanding of the structure of matter and basic interactions, and of the birth and development of the universe. The course also introduces students to experimentation in Physics, focused on determining the orders of magnitude in simple mechanical systems
Learning outcomes	At the end of this learning unit, the student is able to : 1 Introductory course on Mechanics, the physics of waves and aspects of modern Physics.
Evaluation methods	Written exam with multiple-choice questions. Some questions relate to the laboratory sessions held during the year.
Teaching methods	Lectures in class backed up by practical demonstrations. Exercise sessions where problems are solved. Certain aspects of the course will be studied wholly or in more detail in the laboratory.
Content	Introduction to physics - Measurements and associated uncertainties - Vectors - Kinematics - Dynamics of the material point - Oscillating motion - Energy and power - Conservation laws - Gravitation - Dynamics of multi-body systems - Dynamics of the rigid body - Physics of fluids - Heat - Temperature - Laws of gases - Entropy - Introduction to mechanical waves - General characteristics of waves - Stationary and progressive waves - Sound waves - Doppler effect - Interference and diffraction - Introduction to modern physics Restricted relativity and basic concepts of quantum physics
Other infos	Course materials: BENSON Harris, Physics. Mechanical Volume 1 and Volume 3 Waves-Optical and modern Physics, French Translation, De Boeck Université. Students wishing to improve their English would do well to use the English version of this work.
Faculty or entity in charge	ESPO

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Minor in Scientific Culture	MINCULTS	5		
Bachelor : Business Engineering	INGE1BA	6		