UCLouvain	lphys1113 2024	Mechanics 2

5.00 credits	30.0 h + 25.0 h	Q2

Teacher(s)	Lemaitre Vincent ;
Language :	French
Place of the course	Louvain-la-Neuve
Main themes	As a continuation of the topics covered in LPHY1111 Mechanics 1, wave phenomena such as mechanical waves (coupled springs and pendulums, vibrating rope), sound waves and waves on water are studied. The concepts of normal modes of vibration, dispersion, reflection and transmission relationships, wave packets, phase velocity and group velocity, and two and three dimensional waves are discussed.
Learning outcomes	
Evaluation methods	The exam is a written exam consisting in several questions (possibly including multiple choice). The questions will include, on the one hand, one or more problems similar to those solved in the tutorial sessions, during the practical work or during the lecture, and, on the other hand, questions which aim to verify that the concepts and developments presented during the course have been assimilated (questions of understanding or possibly demonstrations made during the lecture, …). It is also essential to bring a simple scientific calculator to the exam. An unjustified absence from the conference will result in a loss of 1 point in the final grade. The terms mentioned above are valid regardless of the session.
Teaching methods	The teaching activities include (1) the theoretical course, (2) tutorial sessions, (3) experimental work in the laboratory, (4) a conference on themes related to the teaching unit and (5) monitoring. It is essential to bring a simple scientific calculator to the tutorial sessions and to the practical work in the laboratory. All of the material is exposed to the theoretical course via slides and notes on the board. The fundamental concepts are illustrated by everyday applications, short films or animations and experiments. The directed exercises play an essential role for the understanding of the theoretical course and make it possible to apply the theoretical notions seen to concrete problems. Participation in the experimental work sessions in the laboratory is not obligatory but it is strongly recommended. A test will also be offered before each lab session and this test may have an impact on the success of the course (see the section on the evaluation method). A laboratory report can be written and submitted at the end of the session. This will be corrected by the assistant for educational purposes but the grade obtained will have no influence on the final grade of the exam. Attendance at the conference is mandatory. A monitoring session, during which the students can ask their questions to the assistants, is organized on a regular basis. The golden rule is of course continuous work. In particular, it is essential that the student regularly solves exercises himself, not just reading their solutions.
Content	1. Free oscillations of simple systems 2. Free oscillations of systems with many degrees of freedom 3. Forced oscillations 4. Traveling waves 5. Reflection, transmission and interference 6. Modulations, pulses and wave packets
Inline resources	The slides (with links to the films or animations projected during the theoretical course), the list of exercises to solve, the materials for practical work in the laboratory and other useful documents are made available to students on the MoodleUCLouvain website of the Classes. The reference book (in French) being out of print, a copy of the chapters of the book can be found on moodleUCL.
Other infos	**Depending on the health conditions, the methods of teaching AND the exam 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
Minor in Physics	MINPHYS	5		🔍
Bachelor in Mathematics	MATH1BA	5		🔍
Bachelor in Physics	PHYS1BA	5		🔍