UCLouvain

lphys2245

2021

Lasers physics

5.00 credits	22.5 h + 7.5 h	Q2

Teacher(s)	Lauzin Clément ;
Language :	English
Place of the course	Louvain-la-Neuve
Prerequisites	Having followed LPHYS2143 is an asset
Main themes	Reminder on light-matter interaction, homogeneous and inhomogeneous broadening, gas lasers, dye lasers, solid state lasers, pulsed lasers and applications.
Learning outcomes	**At the end of this learning unit, the student is able to :** **a. Contribution of the teaching unit to the learning outcomes of the programme (PHYS2M and LPHYS2M1)** AA 1.3, AA1.4, AA 1.6, AA 2.1, AA 2.2, AA 5.3, AA 6.3, AA7.1, AA 7.2, AA7.5, AA7.6, AA 8.1 **b. Specific learning outcomes of the teaching unit** At the end of this teaching unit, the student will be able to: 1 1. recognize the most used lasers and their basic principles ; 2. have in mind the orders of magnitude of important properties of several important lasers ; 3. conceive a basic laser layout and being able to spot strength and bottleneck of this set-up ; 4. explain few applications of lasers in fundamental and applied physics ; 5. conceive different set-up to test the basic properties of a laser ; 6. build an interferometer.
Evaluation methods	The student will be evaluated based on a written report concerning an experimental or theoretical project on lasers. The evaluation will also be based on the defense of this project and an oral examination.
Teaching methods	Lectures, laboratories and experimental demonstrations, applied projects
Content	Reminder on light-matter interaction Homogeneous and inhomogeneous broadening Gas lasers Dye lasers Solid state lasers UV, XUV lasers Fiber lasers Frequency control of a laser Applications : spectroscopic and distance measurements Introduction to mode-locked lasers
Bibliography	S. Hooker and C. Webb « Laser Physics » Oxford master series in Physics, 2010
Faculty or entity in charge	PHYS

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Physical Engineering	FYAP2M	5		🔍
Advanced Master in Nanotechnologies	NANO2MC	5		🔍
Master [120] in Physics	PHYS2M	5		🔍
Master [60] in Physics	PHYS2M1	5		🔍