





5 credits

22.5 h + 22.5 h

Q1

Teacher(s)	Cornet Alain ;Lauzin Clément ;
Language :	English
Place of the course	Louvain-la-Neuve
Main themes	Basic teaching unit, giving a description of all aspects of general optics and an introduction to laser physics
Aims	<p>a. Contribution of the teaching unit to the learning outcomes of the programme (PHYS2MA) Axis N°1: 1.1, 1.2, 1.3, 1.4, 1.5 Axis N°2: 2.2 Axis N°3: 3.1, 3.2 Axis N°4: 4.2 Axis N°5: 5.2, 5.3</p> <p>b. Specific learning outcomes of the teaching unit</p> <p>1 At the end of this teaching unit, the student will be able to :</p> <ol style="list-style-type: none"> 1. understand basic principles of optics used for example in beamsplitters, multielectric mirrors or filters, gratings, interferometers, optical devices'; 2. use Fourier optics to solve problems of diffraction; 3. measure temporal of spatial coherence of light sources; 4. calculate the propagation of Gaussian laser beams; <p>recognize the necessary conditions to build a continuous-wave laser</p> <p>----- <i>The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".</i></p>
Evaluation methods	Written : problems to solve and questions about the theory
Teaching methods	Ex-cathedra and 5 experimental laboratories.
Content	The teaching unit is structured as follows: <ol style="list-style-type: none"> 1. General optics : decomposition in plane waves, polarization, linear interaction with matter, refraction, Fresnel laws, geometrical optics, imaging systems, Jones matrices, interferences, diffraction, temporal and spatial coherence, Fourier optics; 2. Lasers physics and basic properties of lasers : amplifying medium, laser cavity, Q-Switch, propagation of Gaussian beams.
Bibliography	E. Hecht, Optics, Addison-Wesley (2016). ISBN-10: 0133977226
Faculty or entity in charge	PHYS

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Electrical Engineering	ELEC2M	5		
Master [120] in Physical Engineering	FYAP2M	5		
Master [120] in Physics	PHYS2M	5		
Master [60] in Physics	PHYS2M1	5		
Additional module in Physics	LPHYS100P	5		