





5.00 credits

22.5 h + 22.5 h

Q1

Teacher(s)	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.
Learning outcomes	<p><b>At the end of this learning unit, the student is able to :</b></p> <p><b>a. Contribution of the teaching unit to the learning outcomes of the programme (PHYS2M and PHYS2M1)</b>                      AA 1.1, AA 1.2, AA 1.3, AA 1.4, AA 1.5, AA 1.6, AA 2.1, AA 2.2</p> <p><b>b. Specific learning outcomes of the teaching unit</b>                      At the end of this teaching unit, the student will be able to:</p> <ol style="list-style-type: none"> <li>1. understand basic principles of optics used for example in beamsplitters, multilayer dielectric mirrors or filters, gratings, interferometers, optical devices ;</li> <li>2. use Fourier optics to solve problems of diffraction ;</li> <li>3. measure temporal or spatial coherence of light sources ;</li> <li>4. calculate the propagation of Gaussian laser beams ;</li> <li>5. recognize the necessary conditions to build a continuous-wave laser</li> </ol>
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"> <li>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;</li> <li>2. Lasers physics and basic properties of lasers : amplifying medium, laser cavity, Q-Switch, propagation of Gaussian beams.</li> </ol>
Bibliography	E. Hecht, Optics, Addison-Wesley (2016). ISBN-10: 0133977226
Faculty or entity in charge	PHYS

<b>Programmes containing this learning unit (UE)</b>				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Physical Engineering	<a href="#">FYAP2M</a>	5		
Master [120] in Electrical Engineering	<a href="#">ELEC2M</a>	5		
Master [120] in Physics	<a href="#">PHYS2M</a>	5		
Additional module in Physics	<a href="#">APPHYS</a>	5		
Master [60] in Physics	<a href="#">PHYS2M1</a>	5		