





In view of the health context linked to the spread of the coronavirus, the methods of organisation and evaluation of the learning units could be adapted in different situations; these possible new methods have been - or will be - communicated by the teachers to the students.

5 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.
Aims	<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 and 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> <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	<b>Due to the COVID-19 crisis, the information in this section is particularly likely to change.</b> Written : problems to solve and questions about the theory
Teaching methods	<b>Due to the COVID-19 crisis, the information in this section is particularly likely to change.</b> 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	Aims
Master [120] in Physical Engineering	<a href="#">FYAP2M</a>	5		
Master [60] in Physics	<a href="#">PHYS2M1</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="#">LPHYS100P</a>	5		