

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.

2 credits

0 h + 30.0 h

Q1 and Q2

Teacher(s)	Fichefet Thierry ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	LPHYS1213 and LPHYS1221 and LPHYS1231 and LPHYS1241 and (LMAT1261 or LPHYS1201 or LPHYS1202). <i>The prerequisite(s) for this Teaching Unit (Unité d'enseignement – UE) for the programmes/courses that offer this Teaching Unit are specified at the end of this sheet.</i>
Main themes	The objective of this teaching unit is to enable the student to have a first contact with the research in physical sciences through the realization of a project of limited scope (e.g., conduction of a small experiment and analysis of its results, realization of a theoretical calculation, development of a simple numerical model and analysis of its results, analysis and interpretation of data coming from an experiment or a numerical simulation, bibliographical study of a current problematic of physics, ...) within a research team under the supervision of a project leader.
Aims	<p>a. Contribution of the teaching unit to the learning outcomes of the programme</p> <p>AA1: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7 AA2: 2.1, 2.2, 2.3, 2.4 AA3: 3.1, 3.2, 3.3, 3.6 AA4 : 4.1, 4.2, 4.3 AA5 : 5.1, 5.3, 5.4 AA6: 6.1, 6.3, 6.4, 6.5</p> <p>¹ b. Specific learning outcomes of the teaching unit</p> <p>At the end of this teaching unit, the student will be able to: 1. appropriate a scientific question and implement a research methodology to answer it; 2. select the existing relevant bibliography on the subject under study and correctly cite the sources of information; 3. critically read and summarize a scientific article; 4. interact with members of a research team; 5. evaluate and argue the validity of a physical result; 6. represent complex physical results in graphical form; 7. write a small scientific report respecting the structure and style of the relevant field of physics; 8. orally present a research subject in physical sciences respecting time constraints and using adequate visual aids; 9. answer questions in a precise and concise manner.</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	<p>Due to the COVID-19 crisis, the information in this section is particularly likely to change.</p> <p>A written report of ten pages describing the project and its results must be submitted to the holder of the teaching unit and to the project leader during week 11 of the second semester. This report is orally defended by the student in front of the holder of the teaching unit, the project leader and several academic members of the School of Physics during week 13.</p> <p>An interim mark is provided by the project leader to the holder of the teaching unit prior to the defense. This mark takes into account (1) the scientific quality of the work done, (2) the degree of investment, initiative and critical thinking of the student, (3) the degree of immersion of the student in the research team of the project leader, (4) the student's discussions with the project leader and (5) the quality of the written report. At the end of the defense, the mark is modulated according to the quality of the presentation and the answers to the questions asked by the audience.</p>

Teaching methods	<p>Due to the COVID-19 crisis, the information in this section is particularly likely to change.</p> <p>Realization by the student of a research project of limited scope in physical sciences under the guidance of a project leader. The different stages are: creation of a relevant bibliography on the subject, reading and understanding of the selected articles, implementation and execution of the project, analysis and interpretation of the results obtained, writing of a summary report and oral presentation of the report. To carry out this project, the student is immersed in a research group with which he can interact.</p>
Content	<p>This teaching unit consists in the realization by the student of a small research project in physical sciences supervised by a project leader, who guides him in the resolution of the proposed problem. This project is carried out within one of the UCLouvain research institutes in which the academic members of the School of Physics are affiliated (ELI, IMCN, iMMC and IRMP), in one of the federal scientific institutes in which academic members of the School of Physics are working (Royal Observatory of Belgium and Institute of Space Aeronomy of Belgium), in a private company or in the hospital environment. In the first two cases, the project leader is an academic member of the School of Physics. In the other two, it is a member of the host institution; an academic member of the School of Physics must, however, vouch for the quality of the project.</p> <p>The various possible subjects are communicated to the students during an information session organized during the month of October. They all require thirty hours of work from the student and are adapted to his/her knowledge. The choice of the student must be made and communicated to the project leader he/she selected and to the teaching unit holder by mid-November. The realization of the project takes place mainly in the second semester. The precise schedule is established by the project leader in concertation with the student.</p>
Bibliography	<p>Un portefeuille de lecture minimum est communiqué à l'étudiant.e en début de projet.</p>
Faculty or entity in charge	<p>PHYS</p>

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Bachelor in Physics	PHYS1BA	2	LPHYS1213 AND LPHYS1221 AND LPHYS1231 AND LPHYS1241 AND (LMAT1261 OR LPHYS1201 OR LPHYS1202)	