UCLouvain

lepl1502

2023

Project 2

5.00 credits	30.0 h + 30.0 h	Q2

Teacher(s)	Bol David ;Louveaux Jérôme ;Oestges Claude (coordinator) ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	This course assumes that you have acquired the notions of physics as taught in the course LEPL1201, as well as the transversal skills as developed in Project 1 (LEPL1501).
Main themes	The first objective of the P2 project aims to allow each student to appropriate the essential characteristics of the different professions practiced by engineers and more particularly in the experimental approach and the modeling of systems by following a systematic approach. The student will thus better understand the methodological and disciplinary objectives pursued during his studies. The second objective of the project is to pursue the competence of the students in the methodological aspects of project work and collaborative work (see transversal AA). The third objective aims to apply disciplinary concepts worked on during the second semester and which are involved in the design of an electronic system, the choice of materials for its components and their assembly.
Learning outcomes	**At the end of this learning unit, the student is able to :** 1 At the end of the course, the student will be able to: · apply new knowledge acquired in physics: identify and calculate the fundamental elements of electrical circuits (sources, resistors, capacitors, inductances), understand the operation of basic electrical circuits, and understand the energy and power aspects (1.1) apply new knowledge acquired in chemistry to explain the basic characteristics of the conductive, semi-conductive, dielectric and magnetic materials used in the project (1.1) · to produce a material prototype fulfilling a dedicated function (related to the theme of the project, which varies each year) (1.4) · to carry out a simple modeling of the behavior of a circuit or its elements (1.2) · to master basic software tools as well as basic laboratory equipment (1.2) Considering the AA reference of the program "Bachelor in Engineering Sciences, orientation civil engineer" and the complete document which details the progress of the AA on the 4 projects, this project mainly contributes to the development, acquisition and assessment of the following transversal learning outcomes: · In a given incomplete specification, identify, define and write the functional constraints of the project and quantify them (2.1) Seek diverse sources that are reliable and relevant to design the project (2.2; 5.1) · Pose realistic working hypotheses (according to the specifications whose functional constraints are missing), synthesize them and take a critical look at them (2.3; 2.6; 2.7) · Identify and define the tasks to be carried out according to the intermediate objectives provided and plan them (3.1) Take a critical look at the functioning of his group, and more specifically on the points of disagreement, using a tool created by the group (3.2) Write a project report in French with a certain scientific rigor (precise measurements, quality of vocabulary, standards) to convince project managers of the quality of the results (axis 4)

Evaluation methods	In the framework of this course, students are assessed by : • a continuous assessment of the project, which includes a written report (70 % of the continuous assessment grade) to be delivered at the end of the semester and a compulsory presentation/Q&A session (30 % of the continuous assessment grade) in session, carried out in group; • an individual written examination, carried out in session. To calculate the final grade, the weighting given to the continuous assessment is : • 2/3 if the mark of the written exam is higher than 9/20 ; • 0 if the mark of the written exam is lower than 5/20; • linearly progressive between 0, if the mark of the individual written exam is 5/20, and 2/3, if the mark of the written exam is 9/20. The grade for the continuous assessment (including the report and the oral presentation) is individualised according to the student's involvement in the group during the term (compulsory attendance at the activities, active participation in the intermediate work and the assessed work). The work for which a continuous assessment mark is awarded may not be repeated in the second session; the continuous assessment mark acquired in the first session is retained in the event of a second session. The use of generative AI software such as chatGPT is authorized for assistance in writing the reports requested as part of this course. In this instance, however, an appendix will be required detailing, for each of the sections concerned, how the AI was used (information search, drafting and/or correction of the text, ...). In addition, external information sources must be systematically cited in compliance with bibliographic referencing standards.
Teaching methods	The method relies on project-based learning in a group. The project is a particular situational problem due to its duration (one semester) and due to the possibility of integrating the knowledge and skills it provides. The project aims at contextualization and integration and application with the subjects taught during the first or second semester. The project is composed of several stages and organized around supervised group work sessions. Each week, they precede an experimental work session in the laboratory. The method also provides for the evaluation of written report(s) (formative and/or certifying), an oral jury and, possibly, a public demonstration or competition (depending on the yearly theme). This teaching unit also tackles issues linked to sustainable development and transition through the environmental impact analysis of electronic components (e.g. chip, LED, magnet), based on critical bibliographical research and an introduction to life cycle assessment (LCA). This impact analysis, carried out in groups, is concluded by an interactive seminar.
Content	The stages of the project involve: • determining an original application using a given electromagnetic principle (e.g. power transfer, levitation, perpetual motion, etc.), • understanding, mathematically analyzing and experimentally characterizing (via labs) the functions of the various components and electronic blocks of the system applying the studied principle and aimed at the determined application, • designing the complete system for the given application, and validate its operation, • identifying the direct environmental impact of electronic components (through critical bibliographical research), • writing a final report including, among other things, a functional analysis, a justification and a report on the experimental validation and qualification of the system.
Inline resources	Site web Moodle https://moodleucl.uclouvain.be/course/view.php?id=5113
Bibliography	Les documents de référence (énoncé du projet, notices de laboratoire, grilles d'évaluation, planning, fiches techniques des appareils et du matériel, consignes, transparents de présentation ou de restructuration, etc.) sont disponibles sur le site web du cours.
Faculty or entity in charge	BTCI

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Engineering	FSA1BA	5		🔍