UCLouvain

lelme2003

2020

Project in energy

Due to the COVID-19 crisis, the information below is subject to change, in particular that concerning the teaching mode (presential, distance or in a comodal or hybrid format).

6 credits	30.0 h + 30.0 h	Q1 and Q2

Teacher(s)	Contino Francesco ;De Jaeger Emmanuel ;Jeanmart Hervé ;
Language :	English
Place of the course	Louvain-la-Neuve
Aims	The project mainly targets the acquisition of engineering skills similar to those being exploited in a mechatronics, robotics, or energy conversion systems design office or department a. Disciplinary Learning Outcomes A.A. 1.1. 1.2. 1.3. A.A. 2.1. 2.2. 2.3. 2.4. A.A. 3.2. 3.3. A.A. 4.1. 4.2. 4.4. A.A. 5.3. 5.4. 5.5. 5.6. A.A. 6.1. 6.3. 6.4. **At the end of this course, students will be able to**: 1. Analyze a problem proposed by an external entity, and write its corresponding specifications 2. Achieve a pre-study of an electromechanical device and build up a pre-project: finding possible solutions, comparing them based on criterions from the specs, selecting the best solution, making a pilot mock-up, preliminary dimensioning, etc. 3. Conduct the detailed design of the selected electromechanical solution (or a mockup of the solution) including: the components dimensioning; the selection of standard materials and components (bearings, motors, gears, electronics, batteries, thermal engines, sensors, etc.); the production of a global drawing of the solution, and of detailed drawings for fabrication by using CAD software. 4. Integrate the elements of the design into a functional prototype, build up, and assemble this prototype. 1 5. Build up a synthesis dossier presenting all technical details of the selected solution (global drawing, nomenclature, calculations ') for the teaching staff. b. Transversal Learning Outcomes **At the end of this course, students will be able to**: Develop inventiveness while searching innovative solutions to an external problem. Conduct a project in a group, requiring: To rephrase some objectives. To separate the basis problem into sub-tasks. To evaluate the necessary resources for each task, and write down a working plan. To distribute the work to be done within the group. To maintain efficient communication within the group. To make collective decisions. To manage interpersonal relationships within the group, and to potentially solve conflicts in a constructive way. Collect documentation and look for components from suppliers (describing the need, and selecting the most relevant component). Perform a convincing public presentation by arguing on the decisions, in front of the teaching staff. Perform a critical analysis of the functioning of an electromechanical device; anticipate possible failures and out-of-service causes. Guarantee the device security, as well as users' safety. - - - - *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".*

Evaluation methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** Except in exceptional cases, the evaluation concerns the services of the group. The following elements will be taken into account: - the work of the group during the year; interim reports and presentations; - the final presentation and report; The activities on which the evaluation is based are clearly announced to the students. Other activities are subject to formative evaluation.
Teaching methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** At the beginning of the year groups of 4 to 6 students are formed. During the first weeks of the project, each group develops a first energy system on the basis of the documents provided by the teaching team and the information obtained by the members of the group. Emphasis is put on orders of magnitude. The pre-design work continues during the first half of the first quarter (Q1) and ends with a presentation of the "static design of the energy system" in front of the teachers and possibly external experts. The dynamic design started in the first semester continues in the second semester and is the subject of a presentation. The end of the second semester (Q2) is devoted to advanced technical analyses (electrical network, heating network, etc.). The year ends with a final presentation. At each important stage of the project, a report is given by each group. Between the formal stages of the project, consultancy activities are organized.
Content	Group work on the design of the energy system of an autonomous entity (e.g. neighbourhood, village, island, hotel). This activity builds on skills from both mechanics (thermal cycles, wind turbines, etc.) and electricity (network, converters, etc.).
Inline resources	https://moodleucl.uclouvain.be/course/view.php?id=8357
Bibliography	Durant toute l'année, les étudiants sont accompagnés par des tuteur académiques qu'ls rencontrent de façon régulière. En outre, des personnes ressources (étudiants moniteurs, assistants, staff technique) sont disponibles pour traiter des questions particulières.
Other infos	If circumstances require it, interaction between groups and supervisors could take place via online exchanges.
Faculty or entity in charge	ELME

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Electro-mechanical Engineering	ELME2M	6		