


4.0 credits

22.5 h + 22.5 h

2q

|                      |   |
|----------------------|---|
| Teacher(s) :         | Thonnard Jean-Louis ; Lefèvre Philippe ;  |
| Language :           | Français  |
| Place of the course  | Louvain-la-Neuve  |
| Inline resources:    | <a href="http://icampus.uclouvain.be/claroline/course/index.php?cid=LFSAB1506">http://icampus.uclouvain.be/claroline/course/index.php?cid=LFSAB1506</a>   |
| Prerequisites :      |   |
| Main themes :        | --<br>Bibliographic study and understanding of the problem : drawing up of a book of specifications<br>--<br>Development of an appropriate method allowing to solve the problem and of an adequate experimental protocol<br>--<br>Laboratory experiments<br>--<br>Debriefing sessions with tutors and teachers in order to refine analyses and to prepare the final report<br>--<br>Drawing up of a final report and oral presentation  |
| Aims :               | Contribution of the course to the program objectives<br>Regarding the learning outcomes of the program of Bachelor in Engineering, this course contributes to the development and the acquisition of the following learning outcomes:<br>LO 1.1, 1.2<br>LO 2.2, 2.3, 2.6<br>LO 3.1, 3.2<br>LO 4.1, 4.2, 4.4, 4.5<br>LO 5.1<br>Specific learning outcomes of the course<br>The skills addressed by « Project 4 » include on one hand transverse skills, common to all projects 4, and on the other hand disciplinary, technical skills that are specific to each engineering specialty.<br>Transversal learning outcomes:<br>Projects 4 aim at providing students with transversal skills close to the practice of engineering jobs within a multi-disciplinary context :<br>analyse and improve existing systems ;<br>analyse experimental data with a critical mind ;<br>make the distinction between reality and models used to describe or modify it ;<br>deal with the notion of uncertainty in the project approach, its conception and the obtained results.<br>The project will allow for a trial-and-error approach, typically adopted by young engineers at the beginning of their careers.<br>Disciplinary learning outcomes:<br>Biomedical engineering is a multi-disciplinary domain interfacing biomedical sciences with engineering sciences, thus concerning many applications. It is both an important discipline being taught in an increasing number of universities, and a somehow difficult domain to comprehend prima facie.<br>The project aims at teaching engineering students how to apply theoretical knowledges acquired in the biomedical engineering domain. The collaboration of teachers belonging to the health sciences sector and teachers in the science and technologies sector is essential to the realization of a realistic project in biomedical engineering.<br><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> |
| Evaluation methods : | Students will be evaluated both orally in group and individually through a written examination (organised simultaneously for all Projects 4) on the basis of the above mentioned objectives. An evaluation grid is provided at the beginning of the course.<br>Students present and defend their project in front of a jury composed of all course teachers, possibly completed by other tutors having contributed to the project supervision.  |
| Teaching methods :   | Work in small groups supervised by a tutor : regular presentations of progress made.  |
| Content :            | The project will integrate at least two biomedical engineering disciplines. For example, the following projects could be proposed to the students : - Study of cell/material interactions (cell growth, characterization and imaging techniques) - Design of an implant in a physiological environment - Physiological signals measure and physiological noise extraction (EEG, ECG) - Analysis of movement control (gait, eye movements) based on measures of different parameters and mathematical modelling of the studied system.   |

|                              |   |
|------------------------------|---|
| Other infos :                | This course is part of the set of « Project 4 » courses of the programme of bachelor in engineering. « Projects 4 » share common transversal objectives but exist under different versions oriented towards specific disciplinary objectives, corresponding to the majors/minors of the programme. Each student chooses either the project related to his/her major or to his/her minor (if available). . |
| Faculty or entity in charge: | GBIO  |

| <b>Programmes / formations proposant cette unité d'enseignement (UE)</b> |        |         |           |   |
|--|--------|---------|-----------|---|
| Intitulé du programme  | Sigle  | Credits | Prerequis | Acquis d'apprentissage  |
| Bachelor in Engineering  | FSA1BA | 4       | -         |  |