

5.00 credits	30.0 h + 22.5 h	Q2
--------------	-----------------	----

Teacher(s)	Delhayé Benoit (compensates Lefèvre Philippe) ;Lefèvre Philippe ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	This project assumes that you have acquired the basic notions of numerical methods as taught in the LEPL1104 course as well as of signals and systems as taught in the LEPL1106 course.
Main themes	<ul style="list-style-type: none"> <li>• Bibliographic study and understanding of the problem posed; establishment of specifications</li> <li>• Development of an appropriate methodology for solving the problem and an adequate experimental protocol</li> <li>• Performing laboratory experiments</li> <li>• Debriefing session with the tutors and teachers in order to refine the analyzes and prepare the final report</li> <li>• Writing a final report and oral presentation</li> </ul>
Learning outcomes	<p><b>At the end of this learning unit, the student is able to :</b></p> <p><b>Contribution of the course to the program framework</b></p> <p>With regard to the AA reference of the program "Bachelor in Engineering Sciences, orientation civil engineer", this course contributes to the development, acquisition and evaluation of the following learning outcomes:</p> <p>'AA 1.1, 1.2 'AA 2.2, 2.3, 2.6 'AA 3.1, 3.2 'AA 4.1, 4.2, 4.4, 4.5 'AA 5.1</p> <p><b>Course specific learning outcomes</b></p> <p>The skills targeted by "projects 4" consist on the one hand of transversal skills, common to all projects 4, and on the other hand of disciplinary technical skills, specific to each specialization.</p> <p>Transversal skills :</p> <p>The 4 projects aim to acquire transversal skills close to the practice of the engineering profession in a varied disciplinary context:</p> <p>1 ' analyze an existing system and improve it; ' critically analyze experimental data; ' distinguish between reality and the models used to describe or modify it; ' apprehend the notion of uncertainty in the management of the project, in its realization, and in the results obtained.</p> <p>The project will also give pride of place to the right to make mistakes, a characteristic component of a young engineer's early career.</p> <p>Disciplinary technical skills:</p> <p>' Biomedical engineering is a multidisciplinary field located at the interface between biomedical sciences and engineering sciences, and which concerns a multitude of applications. It is therefore both an important discipline and the subject of specific teaching in an ever-increasing number of universities, but also a relatively difficult field to grasp at first glance.</p> <p>The project aims to introduce engineering students to the application of theoretical knowledge acquired in the field of biomedical engineering. The collaboration of teachers from the health sciences and science and technology sectors seems essential to the realization of a realistic project in biomedical engineering.</p> <p>The contribution of this teaching unit to the development and mastery of the skills and achievements of the program(s) can be accessed at the end of this sheet, in the section "<a href="#">Programmes/training offering this teaching unit (TU)</a>".</p>

<p>Evaluation methods</p>	<p>The students will be evaluated both in groups orally and in writing and individually in writing (examination at the same time for all baccalaureate students) on the basis of the specific objectives announced previously. If the individual exam is passed, the weighting is as follows: 25% of the mark for the written summary of a scientific article related to the project and presented orally, 25% of the mark for the written report of the project carried out in a group, 25% of the mark for the presentation presentation of the project by the group, 25% of the mark for an individual written examination.</p> <p>The students present and defend their project in front of a jury made up of all the holders, possibly supplemented by other tutors who have contributed to the supervision of the project.</p> <p>In the final mark, the group (or continuous) evaluation has a weighting of</p> <ul style="list-style-type: none"> <li>• 3/4 when the individual exam is passed</li> <li>• 0 when the mark of the individual exam is lower than 6/20</li> <li>• linear progression between 0 and 3/4 for a mark of the individual exam from 6/20 to 10/20</li> </ul> <p>The group (or continuous) evaluation (including the written report and oral presentation) can be different for students of the same group if the participation of some students is not sufficient. The group (or continuous) evaluation mark from the first session will be the same for the second session. Only the individual exam can be taken during the second session.</p> <p>The use of generative AI software such as chatGPT is authorized for assistance in writing the documents requested as part of this project. However, it must be clearly and completely indicated in the document(s) concerned.</p>
<p>Teaching methods</p>	<p>Work in small groups, supervised by a tutor; regular progress reports.</p>
<p>Content</p>	<p>The project will ensure that at least two disciplines of biomedical engineering are integrated. For example, the following projects could be offered to students: - Study of cell-material interaction (cell growth, characterization and imaging techniques) design of an implant in a physiological medium - Measurement of physiological signals and extraction of physiological noise (EEG, ECG) - Analysis of movement control (walking, eye movements) based on the measurement of parameters and the mathematical modeling of the system studied.</p>
<p>Other infos</p>	<p>This course is part of the set of "Project 4" courses of the civil engineering baccalaureate program. The 4 projects share common transversal objectives but are available in various versions with distinct disciplinary objectives, corresponding to the program sectors. Each student chooses the project proposed by one of his courses.</p>
<p>Faculty or entity in charge</p>	<p>GBIO</p>

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