UCLouvain

lgbio2220

2022

Industrial project in biomedical engineering

5.00 credits	30.0 h + 30.0 h	Q1 and Q2

Teacher(s)	Demoustier Sophie ;Lefèvre Philippe ;Ronsse Renaud ;
Language :	English > French-friendly
Place of the course	Louvain-la-Neuve
Main themes	This course aims at providing a large panel of the scientific and technological challenges in biomedical engineering, both for R&D perspectives and for industrial value-creation perspectives. The course mainly covers the following themes: the IP management, the certification of medical devices and associated standards and norms, the financing of social security and health economy in the broad sense, the functioning and management of a hospital, the management of clinical trials, etc. These themes are further covered in the particular context of biomedical engineering. Moreover, this course includes an important project, whose objective is to exploit the above competences to study a biomedical technology, selected by the students in tandem with the teaching staff. In particular, the project will consist in studying the life cycle of this technology.
Learning outcomes	**At the end of this learning unit, the student is able to :** Regarding the learning outcomes of the programme of "Master in Biomedical Engineering", this course contributes to the development and the acquisition of the following skills : • AA1.1, AA1.2, AA1.3 • AA2.1, AA2.2 • AA3.1, AA3.2 • AA4.3 • AA5.2, AA5.3, AA5.4, AA5.5, AA5.6 • AA6.1, AA6.2, AA6.3, AA6.4 The course mainly targets the acquisition of scientific and industrial competences, and of engineering skills similar to those being exploited in a design office, in the field of biomedical engineering. a. Disciplinary Learning Outcomes **At the end of this course, students will be able to**: 1. Understand and summarize a seminar presenting a specific feature of the clinical, economical and industrial environment in biomedical engineering. 2. Explain the main challenges paving the way during the valorization process for a biomedical technology. 3. Develop expertise regarding the different steps of the life cycle of a biomedical product, and summarize this in a technical report. For instance: commercialization decision, procurement of the CE label, product evolution within a company (product supply to the hospital, positioning with respect to the competitors, etc.), management of the reimbursement procedure by the social security system, etc. b. Transversal Learning Outcomes **At the end of this course, students will be able to**: 4. Write down a clear and concise summary of an industrial seminar. 5. Conduct a project in a group, requiring: a. To rephrase some objectives. b. To separate the basis problem into sub-tasks. c. To evaluate the necessary resources for each task, and write down a working plan. d. To distribute the work to be done within the group. e. To maintain efficient communication within the group. f. To keep the industrial partner in the loop. g. To make collective decisions. h. To manage interpersonal relationships within the group, and to solve potential conflicts in a constructive way. 6. Perform a convincing public presentation. 7. Apply the standards and norms in the biomedical domain.

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Evaluation methods	The evaluation is exclusively based on the group work. The assesment is based on: - the written report and oral presentation of the project - the work done during the year Except exceptional situations, the evaluation takes the group performance into account and is identical across the group students. Individual students who would not have provided a fair personal contribution within their group will perform individual complementary work (to be determined) that will be evaluated within the exam session of September. Moreover, students must take part to the three "Interuniversity Biomedical Engineering Days" to potentially get a Pass mark during the exam session of June. In accordance with article 72 of the RGEE, the teachers reserve the right to propose to the jury that a student who has not participated in the project or who has left his·her group during the year be refused registration for the examination relating to this course, including for the August-September session.
Teaching methods	**Process organisation** Early in the year, students freely make groups of 3 to 4 students. Each group will work on a and select a tbiomedical device deveopped by an industrial partner. The project to be performed will consist in the study of the life cycle of the biomedical device and on the achievment of some specific tasks proposed by the industrial partner. At the end of the second semester, each group will submit a written report and do an oral presentation of its project **Supports** Throughout the implementation of the project, the students will meet regurlarly with the teaching staff and with one contact person of the partner company. Moreover, in the framework of this course, taking part to the three « Interuniversity biomedical engineering days », jointly organized by ULB, UCLouvain, andl ULiège is **mandatory** as they provide the basic expertise required to achieve the project:
Content	• The three "Interuniversity biomedical engineering days" • The National Day on Biomedical Engineering (recommended but not mandatory) • The industrial project with tutoring sessions
Inline resources	https://moodle.uclouvain.be/course/view.php?id=1104
Faculty or entity in charge	GBIO

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Biomedical Engineering	GBIO2M	5		
Master [120] in Mathematical Engineering	MAP2M	5		