

Teacher(s)	Delhayé Benoit ;Lefèvre Philippe ;
Language :	English > French-friendly
Place of the course	Louvain-la-Neuve
Prerequisites	Students need to master the common core skills described in the Civil Engineering Bachelor's programme
Main themes	LGBIO2110 presents the different aspects of engineering duties inside a hospital. This course focuses both on medical devices but also on the processes inside a hospital (patient admission, pre-operative screening '). This course covers a broad range of topics in order to represent the diversity of tasks performed by engineers inside a hospital.
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 • AA3.1, AA3.2 • AA4.1 • AA5.2, AA5.3, AA5.6 • AA6.1, AA6.4 a. <u>Domain-related learning outcomes</u> At the end of this course, students will be able to: • understand the importance of risk analysis in the clinical settings and for medical devices; • explain the different techniques to identify the risk and their respective strengths/weaknesses; • assess the reliability of the clinical literature in the context of a health technology assessment, especially those linked to medical devices; • understand the factors governing health economics and simulating a model of health economics that takes into account the uncertainties of the parameters (e.g. MonteCarlo simulation); • compare the different techniques of quality management used in clinical settings; • master the statistical tools linked to the Six Sigma technique (Control chart, statistical testing, confidence interval); • explain the importance of inventory and maintenance of medical devices in a clinical setting and how they influence risk and quality management. b. <u>Transversal learning outcomes</u> At the end of this course, students will be able to: • read a health technology assessment and present it to a clinical audience; • perform Monte-Carlo simulations; • apply risk analysis tools; • apply quality management methods; • perform a literature search to find scientific articles linked to a specific article.
Evaluation methods	The final mark is obtained as follows: • 45% is awarded based on the evaluation of homeworks during the semester and the presentation of a scientific article linked to the course. • 55% is awarded based on an individual exam during the session (written or oral with preparation). Continuous assessment comprises a number of assignments, which will result together in a single overall mark, communicated after the correction of all assignments. Failure to comply with the methodological guidelines set out on Moodle, particularly with regard to the use of online resources or collaboration between students, for any part of the project, will result in an overall mark of 0 for the continuous assessment. 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.
Teaching methods	The course consists of different modules (risk analysis, health technology assessment, quality management and medical device management).

Inline resources	Moodle https://moodleucl.uclouvain.be/course/search.php?search=LGBIO2110
Bibliography	Plusieurs livres servent de base pour les différents modules. Une copie de ces livres est disponible sur demande auprès de l'enseignant.
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	3		
Master [120] in Computer Science and Engineering	INFO2M	3		
Master [120] in Computer Science	SINF2M	3		