

GBIO2M

2016 - 2017

Master [120] in Biomedical Engineering

At Louvain-la-Neuve - 120 credits - 2 years - Day schedule - In englishDissertation/Graduation Project : **YES** - Internship : **optional**Activities in other languages : **YES**Activities on other sites : **optional**Main study domain : **Sciences de l'ingénieur et technologie**Organized by: **Ecole Polytechnique de Louvain (EPL)**Programme code: **gbio2m** - Francophone Certification Framework: 7**Table of contents**

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GBIO2M - Introduction

Introduction

Introduction

This Master's degree programme produces engineers capable of using a large set of skills (analytical, modelling, design and inventiveness) in order to face future technological challenges in the scientific and technical fields linked to biomedical engineering and this in ever evolving European and global contexts.

Upon completion of this Master's degree programme, you will have fundamental knowledge in all areas of biomedical engineering (bioinstrumentation, biomaterials, imaging and medical physics, mathematical modelling, artificial organs and rehabilitation, bioinformatics and biomechanics) as well as cutting edge knowledge of one or more major fields of study.

Your profile

You:

- Have developed a marked interest in the biomedical field and its technological outputs (as a result of your undergraduate studies);
- Seek targeted information about current scientific or technological issues as well as the national and international job market;
- Want to play a role in development, production or management in the healthcare field.

Your programme

This Master's degree offers:

- Knowledge of the main scientific and industrial issues in the fields of applied biomedical engineering;
- Classes that emphasize theories and practice to develop advanced professional knowledge;
- The choice of one of more major fields of study in biomedical engineering;
- The chance to complete an internship in a hospital, in industry or in a research centre;
- The possibility of completing part of your master's degree abroad (in Europe or elsewhere) and in certain cases the granting of a dual master's degree (diploma granted jointly by UCL and the institution where you studied abroad).

GBIO2M - Teaching profile

Learning outcomes

Nowadays, more and more engineers are bringing their ingenuity and analytical skills to the healthcare field. The objective of the Master's degree programme in biomedical engineering is to graduate engineers being capable of meeting the scientific and technological challenges of biomedical engineering in an ever-changing global and European context. Inherently multidisciplinary, this programme builds upon a strong collaboration between the sector of Sciences and Technologies, and the sector of Health Sciences.

Building up on students' existing knowledge in basic sciences (physics, chemistry, mathematics) and life science (biology, anatomy, biochemistry and physiology), this Master's degree programme offers the opportunity to develop multidisciplinary skills in a wide range of topics. Graduated students will be able to understand and model living systems and ultimately be able to design analytical or therapeutic tools (for example, developing new biomedical technologies).

Graduated students will have fundamental knowledge of the main fields of biomedical engineering: bioinstrumentation, biomaterials, imaging and medical physics, mathematical modelling, artificial organs and rehabilitation, bioinformatics and biomechanics. They will further acquire advanced training in one or more of these fields of expertise.

By choosing among several elective courses, students can opt either for polyvalent profile or one being more specialised. Fields of particular interest include (1) software development and algorithms for biomedical data; (2) biomaterials (implants, etc.); (3) biomechanics and medical robotics; (4) medical imaging and medical physics; (5) clinical engineering (i.e. engineering jobs in the hospital).

On successful completion of this programme, each student is able to :

1. Demonstrate mastery of a solid body of knowledge and skills in basic science and engineering science allowing them to understand and solve biomedical engineering problems (Axis 1).

- 1.1 Identify and use biomedical engineering concepts, laws and reasoning to solve problems in a variety of areas:
 - Develop algorithms and software particularly for dealing with biomedical data; analyse biological data and medical images
 - Biomaterials (interfaces, biocompatibility, etc.)
 - Biomechanics, motor control and medical robotics (for surgery and rehabilitation)
 - Clinical engineering
- 1.2 Identify and use the modelling and calculation tools necessary to solve problems raised by the fields mentioned above
- 1.3 Validate problem solving results, notably those expressed in orders of magnitude:
 - in particular validate models by comparing them to theoretical or experimental results

2. Organise and carry out a procedure in applied engineering related to the development of a product and/or a service that meets a need or solves a particular problem in the field of biomedical engineering (Axis 2).

- 2.1 Analyse a problem, take stock of its functionalities and constraints; create a specifications note that takes into account technical and economic limits.
- 2.2 Model a problem and design one or more technical solutions using mechanical, electric, electronic and computerised approaches with the specifications note in mind.
- 2.3 Evaluate and classify solutions with regard to all the criteria in the specifications note: efficiency, feasibility, quality, ergonomics, security, biocompatibility, etc.
- 2.4 Test a solution through a mock up, a prototype and/or a numerical model.
- 2.5 Formulate recommendations to improve a technical solution either to reject it or to explain necessary improvements to make the product operational.

3. Organise and carry out a research project to understand a physical phenomenon or new problem related to biomedical engineering (Axis 3).

- 3.1 Document and summarize the existing body of knowledge.
- 3.2 Suggest a model and/or an experimental device allowing for the simulation and testing of hypotheses related to the phenomenon being studied.
- 3.3. Write a summary report explaining the potentialities of the theoretical and/or technical innovation resulting from the research project.

4. Contribute as part of a team to the planning and completion of a project while taking into account its objectives, allocated resources, and constraints (Axis 4).

- 4.1 Frame and explain the project's objectives (in terms of performance indicators) while taking into account its issues and constraints (resources, budget, deadlines). Understand the principal mechanisms that govern the healthcare economy as well as the financing of social security.
- 4.2 Collaborate on a work schedule, deadlines and roles, for example the division of labour among students.
- 4.3 Work in a multidisciplinary environment with peers holding different points of view; manage any resulting disagreement or conflicts.

4.4 Make team decisions and assume the consequences of these decisions (whether they are about technical solutions or the division of labour to complete a project).

5. Communicate effectively (speaking or writing in French or a foreign language) with the goal of carrying out assigned projects (Axis 5).

- 5.1 Identify the needs of the client or the user: question, listen and understand all aspects of their request and not just the technical aspects.
- 5.2 Present your arguments and convince your interlocutors (doctors, therapists, technicians, colleagues, clients, superiors) of your technological choices by adopting their language.
- 5.3 Communicate through graphics and diagrams: interpret a diagram, present results, structure information.
- 5.4 Read and analyse different technical documents (rules, plans, specification notes).
- 5.5 Draft documents that take into account contextual requirements and social conventions as well as the vocabulary specific to biomedical disciplines.
- 5.6 Make a convincing oral presentation (in French or English) using modern communication techniques.

6. Demonstrate rigor, openness and critical and ethical awareness in your work: using the technological and scientific innovations at your disposal validate the socio-technical relevance of a hypothesis or a solution (Axis 6).

- 6.1 Rigorously apply the standards of biomedical engineering (terms, units of measure, quality standards and security).
- 6.2 Find solutions that go beyond strictly technical issues by considering sustainable development and the socio-economic ethics of a project, particularly concerning the consequences of a medical or therapeutic practice;
- 6.3 Demonstrate critical awareness of a technical solution in order to verify its robustness and minimize the risks that may occur during implementation.
- 6.4 Evaluate oneself and independently develop necessary skills for "lifelong learning" in the field.

Programme structure

The Master's degree programme includes:

- a core curriculum (35 credits) including a Master thesis and an additional project;
- a set of courses in the Professional focus (30 credits);
- one or more major courses;
- elective courses to round out the programme

A project with an industrial focus (5 credits) is completed at the beginning of the programme (1st year) while the Master thesis is normally completed at the end of the programme (2nd year). It is recommended that students take courses from the Professional focus (30 credits) at the beginning of their Master's programme (1st year). However, students may take these courses in the 1st or 2nd year as long as they have completed the course prerequisites. This is particularly the case for students who completed part of their education abroad.

If during the student's former education, he or she already followed a course being part of the programme (either mandatory or elective) or followed an equivalent activity (pending approval by the programme commission), he or she may replace this activity by elective courses (pending the fulfillment of the programme rules). The student will also verify that he/she has obtained the minimum number of credits required for the approval of the diploma as well as for the approval of their major (in order to include their academic distinctions in the diploma appendix).

These types of programmes will be submitted for approval by the relevant Master's degree programme commission.

For a programme-type, and regardless of the focus, options/or elective courses selected, this master will carry a minimum of 120 credits divided over two annual units, corresponding to 60 credits each.

[> Core courses for the Master's degree in biomedical engineering](#) [en-prog-2016-gbio2m-lgbio220t.html]

[> Professional focus](#) [en-prog-2016-gbio2m-lgbio200s]

Options courses

- > [Majors in biomedical engineering](#) [en-prog-2016-gbio2m-lgbio907r.html]
 - > [Major in Clinical Engineering](#) [en-prog-2016-gbio2m-lgbio221o.html]
 - > [Major in acquisition and processing of biomedical data](#) [en-prog-2016-gbio2m-lgbio222o.html]
 - > [Major in Biomaterials](#) [en-prog-2016-gbio2m-lgbio226o.html]
 - > [Major in Biomechanics and medical robotics](#) [en-prog-2016-gbio2m-lgbio227o.html]
 - > [Major in Medical physics and medical imaging](#) [en-prog-2016-gbio2m-lgbio232o.html]
- > [Majors in business creation and management](#) [en-prog-2016-gbio2m-lgbio908r.html]

- > [Business risks and opportunities](#) [en-prog-2016-gbio2m-lgbio230o.html]
- > [Major in small and medium sized business creation](#) [en-prog-2016-gbio2m-lgbio231o.html]
- > [Elective courses](#) [en-prog-2016-gbio2m-lgbio910r.html]
- > [Elective courses](#) [en-prog-2016-gbio2m-lgbio229o.html]

GBIO2M Detailed programme

Programme by subject

CORE COURSES [35.0]

- Mandatory
- ⊗ Optional
- △ Courses not taught during 2016-2017
- ⊙ Periodic courses not taught during 2016-2017
- ⊕ Periodic courses taught during 2016-2017
- Activity with requisites

Click on the course title to see detailed informations (objectives, methods, evaluation...)

						Year	
						1	2
○ LGBIO2990	Master Thesis	Isabelle.Dargent (coord.)		28 Credits			x
○ LGBIO2220	Seminar and project in biomedical engineering: Scientific and industrial challenges	Sophie.Demoustier Philippe.Lefevre Renaud.Ronsse	30h+30h	5 Credits	1 + 2q	x	x

○ Religion courses for students in natural sciences (2 credits)

The student shall select

⊗ LTECO2100	Questions of religious sciences: Biblical readings	Hans.Ausloos	15h	2 Credits	1q	x	x
⊗ LTECO2200	Questions of religious sciences: reflections about Christian faith	Dominique.Martens	15h	2 Credits	2q	x	x
⊗ LTECO2300	Questions of religious sciences: questions about ethics	Marcela.Lobo	15h	2 Credits	1q	x	x

PROFESSIONAL FOCUS [30.0]

- Mandatory
- ⊗ Optional
- △ Courses not taught during 2016-2017
- ⊙ Periodic courses not taught during 2016-2017
- ⊕ Periodic courses taught during 2016-2017
- Activity with requisites

Click on the course title to see detailed informations (objectives, methods, evaluation...)

The "professional focus" block of the Master in biomedical engineering offers a series of courses describing the main field of biomedical engineering, from bioinformatics to biomechanics and imaging. It thus consolidates the "general" profile of the program. Students can expect to acquire a deep level of knowledge in each of the disciplines, owing to the large volume of credits devoted to this block.

						Year	
						1	2
○ LGBIO2010	Bioinformatics	Pierre.Dupont Michel.Ghislain	30h+30h	5 Credits	2q	x	x

						Year	
						1	2
○ LGBIO2020	Bioinstrumentation	Andre.Mouraux Michel.Verleysen	30h+30h	5 Credits	1q	x	x
○ LGBIO2030	Biomaterials	Sophie.Demoustier Christine.Dupont Gaetane.Leloup	30h+30h	5 Credits	1q	x	x
○ LGBIO2040	Biomechanics	Francois.Henrotte	30h+30h	5 Credits	2q	x	x
○ LGBIO2050	Medical Imaging	Anne.Bol John.Lee Benoit.Macq Frank.Peeters	30h+30h	5 Credits	1q	x	x
○ LGBIO2060	Modelling of biological systems	Philippe.Lefevre	30h+30h	5 Credits	1q	x	x

OPTIONS

Students **MUST** choose at least one major from the 5 biomedical engineering majors. They **MAY** further choose one or more other majors from those in biomedical engineering, or management and business creation.

Majors in biomedical engineering

- > Major in Clinical Engineering [en-prog-2016-gbio2m-lgbio221o]
- > Major in acquisition and processing of biomedical data [en-prog-2016-gbio2m-lgbio222o]
- > Major in Biomaterials [en-prog-2016-gbio2m-lgbio226o]
- > Major in Biomechanics and medical robotics [en-prog-2016-gbio2m-lgbio227o]
- > Major in Medical physics and medical imaging [en-prog-2016-gbio2m-lgbio232o]

Majors in business creation and management

- > Business risks and opportunities [en-prog-2016-gbio2m-lgbio230o]
- > Major in small and medium sized business creation [en-prog-2016-gbio2m-lgbio231o]

Elective courses

- > Elective courses [en-prog-2016-gbio2m-lgbio229o]

MAJORS IN BIOMEDICAL ENGINEERING**MAJOR IN CLINICAL ENGINEERING**

The objective of this major is to provide students with the necessary body of knowledge to work as an engineer in a hospital or in a biomedical products company. It covers areas related to the management of medical technologies, quality control, etc

○ Mandatory

△ Courses not taught during 2016-2017

⊕ Periodic courses taught during 2016-2017

⊗ Optional

⊖ Periodic courses not taught during 2016-2017

■ Activity with requisites

Click on the course title to see detailed informations (objectives, methods, evaluation...)

Students selecting this major may choose

De 20 à 30 credits parmi

Year

1 2

○ Required courses (8 credits)

○ LGBIO2110	Introduction to Clinical Engineering	Frederic.Crevecœur Philippe.Lefevre	30h	3 Credits	2q	x	x
○ LMECA2711	Quality management and control.	Nicolas.Bronchart	30h+30h	5 Credits	2q	x	x

⊗ Elective courses

LSTAT2330 and WESP2123 are mutually exclusive, so as WFSP2218 and LBIRA2101

De 12 à 22 credits parmi

⊗ LBIRA2101	Biometry : analysis of the variance	Xavier.Draye (coord.) Anouar.Elghouch Bernadette.Govaerts	30h+15h	4 Credits	1q	x	x
⊗ LINGI1341	Computer networks	Olivier.Bonaventure	30h+30h	5 Credits	1q	x	x
⊗ LINGI2172	Databases	Siegfried.Nijssen	30h+30h	6 Credits	2q	x	x
⊗ LSTAT2110	Data Analysis	Johan.Segers	22.5h +7.5h	5 Credits	1q	x	x
⊗ LSTAT2310	Statistical quality control.	Bernadette.Govaerts	15h+5h	4 Credits	1q	x	x

						Year	
						1	2
⊗ LSTAT2330	Statistics in clinical trials.	Catherine.Legrand Annie.Robert	22.5h +7.5h	5 Credits	2q	x	x
⊗ LSTAT2360	Seminar in data management: basic	Catherine.Legrand	7.5h+10h	5 Credits	1 ou 2q	x	x
⊗ WESP2123	Principes des essais cliniques	Laurence.Habimana Annie.Robert (coord.) Francoise.Smets	20h+10h	4 Credits	1q	x	x
⊗ WESP2234	Strategy of the medical decision	Laurence.Habimana Annie.Robert (coord.)	30h	3 Credits	1q	x	x
⊗ WFSP2218	Analyse longitudinale : régression linéaire, logistique et de Poisson	Annie.Robert	20h+20h	4 Credits	1q	x	x
⊗ WFSP2260	Management humain et comportement organisationnel	John.Cultiaux Pierre.Meurens (coord.)	40h+30h	5 Credits	2q	x	x

MAJOR IN ACQUISITION AND PROCESSING OF BIOMEDICAL DATA

The objective of this major is to provide students with the necessary body of knowledge to acquire and analyze biomedical data, i.e. either raw signal data or large bases of pre-processed data. This major is especially well-suited for students holding a bachelor in computer science, electricity or applied mathematic

- Mandatory
 △ Courses not taught during 2016-2017
 ⊕ Periodic courses taught during 2016-2017
 ☒ Optional
 ⊖ Periodic courses not taught during 2016-2017
 ■ Activity with requisites

Click on the course title to see detailed informations (objectives, methods, evaluation...)

Students selecting this major may choose
De 20 à 30 credits parmi

Year

1 2

o Required courses (10 credits)

● LELEC2870	Machine Learning : regression, dimensionality reduction and data visualization	John.Lee (compensates Michel Verleysen) Michel.Verleysen	30h+30h	5 Credits	1q	x	x
● LELEC2900	Signal processing	Benoit.Macq Luc.Vandendorpe	30h+30h	5 Credits	2q	x	x

☒ Elective courses

De 10 à 20 credits parmi

☒ LELEC2811	Instrumentation and sensors	David.Bol Laurent.Francis	30h+30h	5 Credits	1q	x	x
☒ LINGI2251	Software Quality Assurance	Charles.Pecheur	30h+15h	5 Credits	2q	x	x
☒ LINGI2261	Artificial intelligence: representation and reasoning	Yves.Deville	30h+30h	6 Credits	1q	x	x
☒ LINGI2262	Machine Learning :classification and evaluation	Pierre.Dupont	30h+30h	5 Credits	2q	x	x
☒ LINMA2361	Nonlinear dynamical systems	Pa.Absil	30h +22.5h	5 Credits	1q	x	x
☒ LINMA2370	Modelling and analysis of dynamical systems	Jean-Charles.Delvenne Denis.Dochain (coord.)	30h +22.5h	5 Credits	1q	x	x
☒ LINMA2471	Optimization models and methods	Francois.Glineur	30h +22.5h	5 Credits	1q	x	x
☒ LINMA2875	System Identification	Julien.Hendrickx	30h+30h	5 Credits	2q	x	x
☒ LSTAT2320	Design of experiment.	Patrick.Bogaert Bernadette.Govaerts	22.5h +7.5h	5 Credits	2q	x	x
☒ LSTAT2110	Data Analysis	Johan.Segers	22.5h +7.5h	5 Credits	1q	x	x
☒ LBIRC2106	Chemometrics	Bernadette.Govaerts	22.5h +15h	3 Credits	1q	x	x
☒ LSTAT2120	Linear models	Christian.Hafner	30h+7.5h	5 Credits	1q	x	x
☒ LBIRA2101	Biometry : analysis of the variance	Xavier.Draye (coord.) Anouar.Elghouch Bernadette.Govaerts	30h+15h	4 Credits	1q	x	x

MAJOR IN BIOMATERIALS

The goal of this major is to provide students with the necessary body of knowledge to understand and develop technologies related to biomaterials (implants, biocompatibility, etc.). This major is particularly well-suited for students holding a bachelor in applied chemistry and physics AND biomedical engineering.

● Mandatory

△ Courses not taught during 2016-2017

⊕ Periodic courses taught during 2016-2017

⊗ Optional

⊖ Periodic courses not taught during 2016-2017

■ Activity with requisites

Click on the course title to see detailed informations (objectives, methods, evaluation...)

Students selecting this major may choose

De 20 à 30 credits parmi

Year

1 2

Required courses KIMA students

KIMA students must enrol in LGBIO2030 and LBIR1220A except if they took these courses during their undergraduate programme.

De 5 à 10 credits parmi

● LBIR1220A	Biochimie I (partim EPL)	Michel.Ghislain Yvan.Larondelle (coord.)	30h+15h	5 Credits	2q	x	x
● LGBIO2030	Biomaterials	Sophie.Demoustier Christine.Dupont Gaetane.Leloup	30h+30h	5 Credits	1q	x	x

Required courses GBIO students

GBIO students must enrol in LMAPR2481 and LMAPR1805 unless they took these courses during their undergraduate (BAC) programme.

De 5 à 10 credits parmi

● LMAPR1805	Introduction to materials science	Jean-Christophe.Charlier Pascal.Jacques Aurelien.Lherbier (compensates Jean-Christophe Charlier) Bernard.Nysten Thomas.Pardoen (coord.)	45h+15h	5 Credits	2q	x	x
● LMAPR2481	Deformation and fracture of materials	Thomas.Pardoen	30h+30h	5 Credits	1q	x	x

Recommended courses

De 10 à 21 credits parmi

⊗ LBIR1321	Biochemistry II : metabolic pathways and their regulation	Michel.Ghislain (coord.) Yvan.Larondelle	30h+15h	3 Credits	1q	x	x
⊗ LBIO1335	Immunology	Jean-Paul.Dehoux	25h+15h	3 Credits	1q	x	x
⊗ LELEC2560	Micro and Nanofabrication Techniques	Laurent.Francis Benoit.Hackens Jean-Pierre.Raskin	30h+30h	5 Credits	2q	x	x
⊗ LMAPR2012	Macromolecular Nanotechnology	Sophie.Demoustier (compensates Bernard Nysten) Sophie.Demoustier Sophie.Demoustier (compensates Karine Glinel) Karine.Glinel Jean-Francois.Gohy (compensates Bernard Nysten) Jean-Francois.Gohy Jean-Francois.Gohy (compensates Karine Glinel) Bernard.Nysten	45h+15h	5 Credits	2q	x	x
⊗ LMAPR2019	Polymer Science and Engineering	Sophie.Demoustier Alain.Jonas Evelyne.Vanruymbeke	45h+15h	5 Credits	1q △	x	x

⌘ Elective courses

max=15 credits parmi

⌘ LBIRC2101A	Analyse biochimique et notions de génie génétique: analyse biochimique	Francois.Chaumont Charles.Hachez Pierre.Morsomme	18.5h +22.5h	4 Credits	1q	x	x
⌘ LBIRC2108	Biochemical and Microbial Engineering	Iwona.Cybulska	30h +22.5h	5 Credits	2q	x	x
⌘ LGBIO2020	Bioinstrumentation	Andre.Mouraux Michel.Verleysen	30h+30h	5 Credits	1q	x	x
⌘ LMAPR2010	Polymer Materials	Christian.Bailly Bernard.Nysten Evelyne.Vanruymbeke	45h+15h	5 Credits	1q Δ	x	x
⌘ LMAPR2013	Physical Chemistry for Metals and Ceramics	Pascal.Jacques	30h+30h	5 Credits	1q	x	x
⌘ LMAPR2014	Physics of Functional Materials	Xavier.Gonze Luc.Piroux Gian-Marco.Rignanese	37.5h +22.5h	5 Credits	1q	x	x
⌘ LMAPR2018	Rheometry and Polymer Processing	Christian.Bailly Evelyne.Vanruymbeke	30h +22.5h	5 Credits	2q	x	x
⌘ LMAPR2631	Surface Analysis	Arnaud.Delcorte Bernard.Nysten Bernard.Nysten (compensates Arnaud Delcorte)	30h+15h	5 Credits	2q	x	x

MAJOR IN BIOMECHANICS AND MEDICAL ROBOTICS

The goal of this major is to provide students with the necessary body of knowledge to understand and develop technologies related to biomechanics (fluids and solids) and medical robotics (surgical assistance and rehabilitation). This major is particularly well-suited for students holding a bachelor in mechanics.

● Mandatory

△ Courses not taught during 2016-2017

⊕ Periodic courses taught during 2016-2017

⊗ Optional

⊖ Periodic courses not taught during 2016-2017

■ Activity with requisites

Click on the course title to see detailed informations (objectives, methods, evaluation...)

Students selecting this major may choose

De 20 à 30 credits parmi

Year

1 2

○ Required courses (10 credits)

○ LMECA2170	Numerical Geometry	Vincent.Legat Jean-Francois.Remacle	30h+30h	5 Credits	1q	X	X
○ LMECA2355	Mechanical design in biomedical engineering	Olivier.Cartiaux Benoit.Herman (compensates Benoît Raucent) Benoit.Raucent	30h+30h	5 Credits	1q	X	X

⊗ Elective courses

De 10 à 20 credits parmi

⊗ LINMA2671	Advanced control and applications	Julien.Hendrickx	30h+30h	5 Credits	1q	X	X
⊗ LINMA2875	System Identification	Julien.Hendrickx	30h+30h	5 Credits	2q	X	X
⊗ LMECA2300	Advanced Numerical Methods	Philippe.Chatelain Christophe.Craeye Vincent.Legat Jean-Francois.Remacle	30h+30h	5 Credits	2q	X	X
⊗ LMECA2330	Machine components	Laurent.Delannay Benoit.Raucent Renaud.Ronsse Th.Servais (compensates Benoît Raucent)	30h+30h	5 Credits	2q	X	X
⊗ LMECA2660	Numerical methods in fluid mechanics	Gregoire.Winckelmans	30h+30h	5 Credits	2q	X	X
⊗ LMECA2732	Introduction to robotics	Renaud.Ronsse	30h+30h	5 Credits	2q	X	X
⊗ LMECA2755	Industrial automation	Bruno.Dehez Paul.Fisette Renaud.Ronsse	30h+30h	5 Credits	1q	X	X
⊗ LMECA2802	Multibody system Dynamics	Paul.Fisette	30h+30h	5 Credits	2q	X	X
⊗ LMECA2840	Project in Mechanical Design II	Bruno.Dehez Benoit.Herman (compensates Benoît Raucent) Benoit.Raucent Renaud.Ronsse	30h+30h	6 Credits	1 + 2q	X	X

MAJOR IN MEDICAL PHYSICS AND MEDICAL IMAGING

The goal of this major is to provide students with the necessary body of knowledge to understand and develop technologies related to medical physics and medical imaging. This major is particularly well-suited for students holding a bachelor in electricity or applied chemistry and physics.

- Mandatory
 △ Courses not taught during 2016-2017
 ⊕ Periodic courses taught during 2016-2017
- ✘ Optional
 ⊖ Periodic courses not taught during 2016-2017
 ■ Activity with requisites

Click on the course title to see detailed informations (objectives, methods, evaluation...)

Students selecting this major may choose
De 20 à 30 credits parmi

Year

1 2

o Required courses (10 credits)

● LELEC2885	Image processing and computer vision	Christophe.Devleeschouwer Laurent.Jacques	30h+30h	5 Credits	1q	x	x
● LPHY2236	Ionizing radiation measurement: detectors and Nuclear electronics.	Eduardo.Cortinagil	37.5h +55h	5 Credits	1q	x	x

✘ Elective courses

De 10 à 20 credits parmi

✘ LMECA2645	Major technological hazards in industrial activity.	Denis.Dochain Alexis.Dutrieux	30h	3 Credits	2q	x	x
✘ LPHY2340	Use, management and control of radio elements	Pascal.Froment	22.5h	3 Credits	2q	x	x
✘ LPHY2360	Physique atomique, nucléaire et des radiations	Krzysztof.Piotrkowski	22.5h	2 Credits		x	x
✘ WMNUC2100	Master and complementary master	Veronique.Roelants Thierry.Vanderborght (coord.)	15h	2 Credits	1q	x	x
✘ WRDTH3120	Dosimétrie en radiothérapie et contrôle de qualité	Stefaan.Vynckier	30h	3 Credits	2q	x	x
✘ WRDTH3131	Radiobiologie	Vincent.Gregoire Pierre.Scaillet (coord.)	22.5h	2 Credits	2q	x	x
✘ WRDTH3160	Dosimétrie informatisée en radiothérapie	Vincent.Gregoire Pierre.Scaillet Stefaan.Vynckier (coord.)	30h+60h	5 Credits	2q	x	x
✘ WRPR2001	Notions de base de radioprotection	Michael.Dupont Vincent.Gregoire (coord.)	10h+5h	2 Credits	1q	x	x
✘ WRPR2330	Utilisation des radioisotopes et des molécules marquées en biologie	Bernard.Gallez (coord.) Thierry.Vanderborght	15h+15h	3 Credits	2q	x	x

MAJORS IN BUSINESS CREATION AND MANAGEMENT

These two majors are exclusive. Students may choose only one.

BUSINESS RISKS AND OPPORTUNITIES

● Mandatory

△ Courses not taught during 2016-2017

⊕ Periodic courses taught during 2016-2017

⊗ Optional

⊖ Periodic courses not taught during 2016-2017

■ Activity with requisites

Click on the course title to see detailed informations (objectives, methods, evaluation...)

This major may not be taken if the major in small and medium sized business creation is taken. Students selecting this major may choose

De 16 à 20 credits parmi

						Year	
						1	2
⊗ LFSA2140	Elements of law for industry and research	Fernand.Devisscher Werner.Derijcke Benedicte.Inghels	30h	3 Credits	1q	x	x
⊗ LFSA2230	Introduction to management and to business economics	Benoit.Gailly Vincent.Reuter (compensates Benoît Gailly)	30h+15h	4 Credits	2q	x	x
⊗ LFSA1290	Introduction to financial and accounting management	Andre.Nsabimana (compensates Gerrit Sarens) Gerrit.Sarens	30h+15h	4 Credits	2q	x	x
⊗ LFSA2202	Ethics and ICT	Axel.Gosseries Maxime.Lambrecht (compensates Olivier Pereira) Olivier.Pereira	30h	3 Credits	2q	x	x
⊗ LFSA2245	Environment and business	Thierry.Brechet	30h	3 Credits	1q	x	x
⊗ LFSA2210	Organisation and human resources	John.Cultiaux	30h	3 Credits	2q	x	x

⊗ Alternative to the major in business risks and opportunities for computer science students

Computer science students who have already taken courses in this field while pursuing their Bachelor's degree may choose between 16-20 credits from the courses offered in the management minor for computer sciences.

MAJOR IN SMALL AND MEDIUM SIZED BUSINESS CREATION

Accessible from most of the Masters' degrees in engineering, the goal of this major is to familiarize engineering students with the specifics of small and medium sized businesses, entrepreneurship, and business development in order to develop the necessary abilities, knowledge and tools to create their own business. This major is accessible only to a small number of students whose selection is based on a written application and individual interview. The written application must be submitted before the beginning of the first academic year of the Master.

Applications may be sent to:

Secrétariat CPME-Place des Doyens, 1

1348 Louvain-la-Neuve (tel. 010/47 84 59)

Selected students will replace their Master's thesis in the core curriculum with a thesis related to business creation (the number of credits remaining the same).

● Mandatory

△ Courses not taught during 2016-2017

⊕ Periodic courses taught during 2016-2017

⊗ Optional

⊖ Periodic courses not taught during 2016-2017

■ Activity with requisites

Click on the course title to see detailed informations (objectives, methods, evaluation...)

Further information about this major may be found at <http://www.uclouvain.be/cpme>. This major may not be taken at the same time as a major in management. Students in this major may choose 20-25 credits from the following courses:

De 20 à 25 credits parmi

Year

1 2

o Required courses for the major in small and medium sized businesses

○ LCPME2001	Entrepreneurship Theory (in French)	Frank.Janssen	30h+20h	5 Credits	1q	x	
○ LCPME2002	Managerial, legal and economic aspects of the creation of a company (in French)	Regis.Coeurderoy Yves.Decordt Marine.Falize (compensates Régis Coeurderoy)	30h+15h	5 Credits	1q	x	x
○ LCPME2003	Business plan of the creation of a company (in French)	Frank.Janssen	30h+15h	5 Credits	2q		x
○ LCPME2004	Advanced seminar on Entrepreneurship (in French)	Roxane.DeHoe (compensates Frank Janssen) Frank.Janssen	30h+15h	5 Credits	2q	x	x

⌘ Prerequisite CPME courses

Students who have not taken management courses during their previous studies must enroll in LCPME2000.

○ LCPME2000	Venture creation financment and management I	Olivier.Giacomin Paul.Vanzeveren	30h+15h	5 Credits	1q	x	
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ELECTIVE COURSES**ELECTIVE COURSES**

All major courses in the G BIO Master's degree programme may be taken as electives. In addition, the classes listed below are particularly suitable for biomedical engineering students and may be taken as electives to fill the programme.

● Mandatory

△ Courses not taught during 2016-2017

⊕ Periodic courses taught during 2016-2017

⊗ Optional

⊖ Periodic courses not taught during 2016-2017

■ Activity with requisites

Click on the course title to see detailed informations (objectives, methods, evaluation...)

max=45 credits parmi

Year

1 2

⊗ Elective courses in Genetic engineering

⊗ LBIR1322	General genetics	Philippe.Baret	45h+15h	4 Credits	2q	x	x
⊗ LBIRC2101B	Analyse biochimique et notions de génie génétique: Notions de génie génétique	Francois.Chaumont Charles.Hachez Pierre.Morsomme	18.5h +22.5h	4 Credits	1q	x	x
⊗ LBRMC2101	Genetic engineering	Francois.Chaumont (coord.) Charles.Hachez	30h+7.5h	3 Credits	1q	x	x

⊗ Elective courses in biochemical engineering

⊗ LBRAL2102	Physiological and nutritional biochemistry	Yvan.Larondelle (coord.) Yves-Jacques.Schneider	52.5h	5 Credits	1q	x	x
⊗ LBRAL2104	Food microbiology	Jacques.Mahillon	30h +22.5h	5 Credits	2q	x	x
⊗ LBRMC2202	Cell culture technology	Charles.Hachez Pascal.Hols Yves-Jacques.Schneider (coord.)	30h	3 Credits	1q	x	x
⊗ LBRNA2202	Nano-biotechnologies	Yves.Dufrene	30h	3 Credits	2q	x	x
⊗ LBRTE2201	Human and environmental toxicology	Alfred.Bernard Cathy.Debier (coord.)	45h+7.5h	5 Credits	1q	x	x

⊗ Elective courses in pharmaceutical engineering

⊗ LINMA2300	Process Control	Denis.Dochain	30h+30h	5 Credits	1q	x	x
⊗ LMAPR2118	Fluid-fluid separations	Patricia.Luis Denis.Mignon Bart.Vanderbruggen (compensates Patricia Luis Alconero)	30h +22.5h	5 Credits	2q	x	x
⊗ LMAPR2330	Reactor Design	Juray.Dewilde	30h+30h	5 Credits	2q	x	x
⊗ LMAPR2380	Solid-fluid separation	Pierre.Adam Tom.Leyssens	30h +22.5h	5 Credits	1q	x	x
⊗ LMAPR2430	Industrial processes for the production of base chemicals	Juray.Dewilde	30h +22.5h	5 Credits	1q	x	x
⊗ WFARM1008	Design of the drug	Olivia.Dalleur (compensates Véronique Préat) Severine.Henrard	15h+15h	2 Credits	2q	x	x
⊗ WFARM1232	General Pharmacology	Emmanuel.Hermans	15h+7.5h	2 Credits	1q	x	x
⊗ WFARM1307	Physical pharmacy	Tom.Leyssens	15h	2 Credits	1q	x	x

⌘ Elective courses in statistics

This module in statistics offers courses being useful for data processing (analysis laboratory, clinical research, quality management, etc.). Students taking at least 45 credits in this module and among courses in statistics from the majors of the Master (labels LBIRA, LBIRC, LSTAT, WESP, WFSP) will later get a direct access to the second year of the Master in Statistics: Biostatistics [120 credits]. More information about this program bridge via info-stat-actu@uclouvain.be

⌘ LSTAT2020	Statistical computing	Celine.Bugli (compensates Bernadette Govaerts) Bernadette.Govaerts	20h+20h	6 Credits	1q	X	X
⌘ LSTAT2040	Statistical analysis	Anouar.Elghouch (compensates Ingrid Van Keilegom) Ingrid.Vankeilegom	30h+15h	5 Credits	2q	X	X
⌘ LSTAT2130	Introduction to Bayesian statistics.	Philippe.Lambert	15h+5h	4 Credits	2q	X	X
⌘ LSTAT2170	Times series	Rainer.Vonsachs	22.5h +7.5h	5 Credits	2q	X	X
⌘ LSTAT2210	Advanced linear models	Catherine.Legrand	15h+5h	4 Credits	1q	X	X
⌘ LSTAT2220	Analysis of survival and duration data	Ingrid.Vankeilegom	15h+5h	4 Credits	1q	X	X

⌘ Short-term exchanges (2 credits)

Students may include in their curriculum any BEST or ATHENS course subject to approval by the programme committee. These courses are worth 2 credits.

Students may include in their curriculum any BEST or ATHENS subject to approval by the Diploma committee. These courses are worth 2 credits

⌘ Languages

Students may select from any language course offered at the ILV for a maximum of 3 credits out of the 120 core credits needed for their Master's degree. Special attention is placed on the following seminars in professional development:

Students may include in their electives any language course of the Institute of Modern Languages (ILV) for a maximum of 3 credits within the 120 basic credits of their Master's. Their attention is drawn to the following professional insertion seminars:

⌘ LALLE2500	Professional development seminar German	Caroline.Klein Ann.Rinder (coord.)	30h	3 Credits	1 + 2q	X	X
⌘ LALLE2501	Professional development seminar-German	Caroline.Klein Ann.Rinder (coord.)	30h	5 Credits	1 + 2q	X	X
⌘ LESPA2600	Vocational Induction Seminar - Spanish (B2.2/C1)	Paula.Lorente (coord.)	30h	3 Credits	1q	X	X
⌘ LESPA2601	Vocational Induction Seminar - Spanish (B2.2/C1)	Paula.Lorente (coord.)	30h	5 Credits	1q	X	X
⌘ LNEER2500	Professional development seminar: Dutch - intermediate level	Isabelle.Demeulenaere (coord.) Mariken.Smit	30h	3 Credits	1 ou 2q	X	X
⌘ LNEER2600	Professional development seminar: Dutch - upper-intermediate level	Isabelle.Demeulenaere (coord.)	30h	3 Credits	1 ou 2q	X	X

⌘ Other possible courses

Students may select up to 6 credits classes in the programmes of the whole university (including humanities), except if he/she took a major in business creation and management.

A list of interesting humanities courses is available at the secretariat of the diploma committee. Students may choose a maximum of 6 credits. This possibility is however not offered to students who have chosen to specialize in Management or Company launching.

⌘ Tutoring training (3 credits)

⌘ LFSA2351A	Group dynamics	Piotr.Sobieski (coord.) Vincent.Wertz (coord.)	15h+30h	3 Credits	1q	X	X
⌘ LFSA2351B	Group dynamics	Piotr.Sobieski (coord.) Vincent.Wertz (coord.)	15h+30h	3 Credits	2q	X	X

Year

1 2

⌘ Company internships (10 credits)

When the company internship is completed at the same time as the graduation project, it is possible to enrol in LFSA2996 for 5 credits

⌘ LFSA2995	Company Internship	Jean-Pierre.Raskin	30h	10 Credits	1 + 2q	x	x
⌘ LFSA2996	Company Internship			5 Credits	1 + 2q	x	x
⌘ LFSA2212	Innovation classes	Pierre.Latteur Benoit.Macq Benoit.Raucent	30h+15h	5 Credits	1q	x	x

Course prerequisites

A document entitled [en-prerequis-2016-gbio2m.pdf](#) specifies the activities (course units - CU) with one or more pre-requisite(s) within the study programme, that is the CU whose learning outcomes must have been certified and for which the credits must have been granted by the jury before the student is authorised to sign up for that activity.

These activities are identified in the study programme: their title is followed by a yellow square.

As the prerequisites are a requirement of enrolment, there are none within a year of a course.

The prerequisites are defined for the CUs for different years and therefore influence the order in which the student can enrol in the programme's CUs.

In addition, when the panel validates a student's individual programme at the beginning of the year, it ensures the consistency of the individual programme:

- It can change a prerequisite into a corequisite within a single year (to allow studies to be continued with an adequate annual load);
- It can require the student to combine enrolment in two separate CUs it considers necessary for educational purposes.

For more information, please consult [regulation of studies and exams](#).

The programme's courses and learning outcomes

For each UCL training programme, a [reference framework of learning outcomes](#) specifies the competences expected of every graduate on completion of the programme. You can see the contribution of each teaching unit to the programme's reference framework of learning outcomes in the document "In which teaching units are the competences and learning outcomes in the programme's reference framework developed and mastered by the student?"

The document is available by clicking [this link](#) after being authenticated with UCL account.

GBIO2M - Information

Admission

Decree of March 31st 2004 defining higher education, favoring its integration in the European framework of higher education and refinancing universities.

The admission requirements have to be met at the time of enrolment at the university.

All information can be obtained from the [University's Enrolment Office \(Service des inscriptions – SIC\)](#).

[General conditions](#)

[Special conditions](#)

[Language examination: knowledge of the French language \(Pedagogical Master's degree\)](#)

General conditions

Students with one of the following qualifications have access to studies leading to the award of a Master's degree:

- an undergraduate (first-cycle) degree in the same field of study;
- the same Master's (second-cycle) degree, but with a different specialization;
- a university degree, in accordance with a decision by the academic authorities and subject to the additional conditions that they lay down;
- a "long-type" degree that gives access to Master's studies, in accordance with a decision by the Government and subject to the additional conditions that it lays down;
- a degree comparable to those mentioned above, issued under the same conditions by the Flemish Community of Belgium, the German Community of Belgium or the Royal Military Academy;
- a degree obtained abroad and deemed equivalent to those mentioned above.

By way of derogation, Master's programmes are also open to students who, in order to obtain their undergraduate degree in the same field of study, still have to gain no more than 12 credits and are registered for those courses. However, students admitted on these terms cannot be passed by the Master's Examination Board until they have met the admission requirements in full and have obtained the necessary undergraduate degree.

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- Access to the 2nd cycle on the basis of a "short-cut":
 - Access to the 2nd cycle of university for those students who have a [short-type non-university higher education degree](#)
 - Access to the 2nd cycle of university for those students who have a [long-type non-university higher education degree](#)
- Access to the 2nd cycle on the basis of the enhancement of the knowledge and competence acquired by personal and professional experience:

With the aim of acceding 2nd-cycle studies, the jury of these studies can enhance the [knowledge and competence acquired by their personal and professional experience](#).

This useful experience must correspond to at least 5 years of activities, without taking into account the years of higher-education study that were not passed successfully. At the end of an evaluation procedure organized by the academic authorities, the jury will decide whether the skills and knowledge of the student are sufficient to be able to follow these studies successfully (*).

- For those students who have an academic grade from a Belgian university or a foreign title or grade (which does not give access to studies in this particular year on the basis of the general conditions mentioned above), access to the 2nd basic cycle on the basis of an enhancement of 180 ECTS credits by the admissions jury (personalized admission on the basis of a file). (*)

(*) At the end of the admissions procedure organized by the competent jury and subject to the conditions fixed by the academic authorities, the student may follow complementary studies that make up a maximum of 60 supplementary credits. In case the supplementary workload of this student exceeds 15 credits, this training is considered to be a preparatory year. It does not lead to a degree and is considered to be the last year of a 1st cycle that gives access to the studies aimed at.

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No student can be admitted to any one year of a Pedagogical Master's degree if they have not passed an [examination attesting to a sufficient knowledge of the French language](#).

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In the event of the divergence between the different linguistic versions of the present conditions, the French version shall prevail

- [University Bachelors](#)

- Non university Bachelors
- Holders of a 2nd cycle University degree
- Holders of a non-University 2nd cycle degree
- Adults taking up their university training
- Personalized access

University Bachelors

Diploma	Special Requirements	Access	Remarks
UCL Bachelors			
Bachelor in engineering [180.0]	Minor in biomedical engineering	Direct access	
Bachelor in engineering [180.0]		Access with additional training	Students who have neither majored nor minored in the field of their civil engineering Master's degree, must submit a written application in which they list their detailed course curriculum (list of course work and marks year by year) to the programme commission. The commission will then suggest a programme in keeping with the student's previous course of study with the possible addition of a maximum of 15 supplemental credits.
Bachelor in chemical sciences [180.0] Bachelor in physics [180.0] Bachelor in mathematics [180.0] Bachelor in biology [180.0] Bachelor in geography, main stream [180.0] Bachelor in bioengineering [180.0]		Access with additional training	The jury may admit candidates with excellent academic records and training on the basis of their written application provided that they integrate a maximum of 60 additional credits into their Master's degree programme. A minor in engineering sciences (biomedical engineering) is considered an advantage for candidates seeking this type of admission.
Others Bachelors of the French speaking Community of Belgium			
Bachelor in engineering	With specific options in former institution related to biomedical engineering	Direct access	
Bachelor in engineering		Access with additional training	Students with a Bachelor's degree in engineering sciences (with a focus on civil engineering) who have not taken the equivalent of a minor in biomedical engineering must submit a written application to the biomedical programme commission in which they list their detailed course curriculum (list of course work and marks year by year). The jury will suggest a programme in keeping with the student's previous course of study with the possible addition of a maximum of 15 supplemental credits.
Bachelor in chemistry, physics, mathematics, biology or geography Bachelor in bio-engineering	With specific options in former institution related to biomedical engineering	Access with additional training	The jury may admit candidates with excellent academic records and training on the basis of their written application provided that they integrate a maximum of 60 additional credits into their Master's degree programme.

			A minor in engineering sciences (biomedical) is considered an advantage for candidates seeking this type of admission.
Bachelors of the Dutch speaking Community of Belgium			
Bachelor in engineering	With specific options in former institution related to biomedical engineering	Direct access	
Bachelor in engineering		Access with additional training	Students who have no specialisation in biomedical engineering must submit a written application to the programme commission in biomedical engineering in which they list their detailed course curriculum (list of course work and marks year by year). The jury will suggest a programme in keeping with the student's previous course of study with the possible addition of a maximum of 15 supplemental credits.
Bachelor's degree equivalent to one of those required from graduates of the French-speaking community	With specific options in former institution related to biomedical engineering	Access with additional training	Students without a Bachelor's degree in engineering sciences (with a focus on civil engineering) must submit a written application to EPL in which they list their detailed course curriculum (list of course work and marks year by year). The jury will determine whether the student may be admitted (based solely on the common Bachelor's degree training for engineering sciences with a focus on civil engineering) and their decision will be in keeping with the rules pertaining to bridge years. When necessary, the jury may suggest a programme in keeping with the student's previous course of study with the possible addition of a maximum of 15 supplemental credits.
Foreign Bachelors			
Bachelor in engineering	Bachelors from the Cluster network	Direct access	Conditions imposed on UCL Engineering Bachelor.
Bachelor in engineering	Other institutions	Access with additional training	Students will submit a written application for admission to EPL in which they list their detailed course curriculum (list of course work and marks year by year). The jury will determine whether the candidate may be admitted according to the regulations. Where necessary the jury may suggest a programme in keeping with the student's previous course of study with the possible addition of a maximum of 15 supplemental credits.

Non university Bachelors

Diploma	Access	Remarks
> Find out more about links to the university		
> BA en sciences industrielles - type long	Accès au master moyennant ajout de maximum 60 crédits d'enseignements supplémentaires obligatoires au programme. Voir 'Module complémentaire'	Type long

— Holders of a 2nd cycle University degree

Diploma	Special Requirements	Access	Remarks
"Licenciés"			
Engineers considered equivalent to the corresponding Bachelor's degree		Direct access	
Masters			
Master in engineering		Direct access	

— Holders of a non-University 2nd cycle degree

Diploma	Access	Remarks
> Find out more about links to the university		
> MA en sciences de l'ingénieur industriel (toutes finalités) > MA en sciences industrielles (toutes finalités)	Accès direct au master moyennant ajout éventuel de 15 crédits max	Type long

— Adults taking up their university training

> See the website [Valorisation des acquis de l'expérience](#)

It is possible to gain admission to all masters courses via the validation of professional experience procedure.

— Personalized access

Reminder : all Masters (apart from Advanced Masters) are also accessible on file.

Students may submit an application for admission to the Louvain School of Engineering in which they list their detailed course curriculum (list of course work and marks year by year). The School in collaboration with the relevant programme commission will determine whether the student may be admitted and their decision will respect the programme rules. When necessary, they may suggest an individualised programme consisting of a part of the elective courses in the relevant Master's degree programme in civil engineering with the possible addition of a maximum of 15 supplemental credits.

The School in collaboration with the relevant programme commission will determine whether the student may be admitted and their decision will respect the programme rules. When necessary, the jury may suggest a programme in keeping with the student's previous course of study with the possible addition of a maximum of 15 supplemental credits.

— Admission and Enrolment Procedures for general registration

Teaching method

Methods that promote multidisciplinary

The Master's degree programme in biomedical engineering is by nature interdisciplinary because it lies at the interface between engineering and biomedical sciences. It is grounded on a solid course programme that provides students with knowledge of the main areas in biomedical engineering as well as various majors in related disciplines.

Various teaching strategies

The teaching methods used in the Master's degree programme in biomedical engineering are consistent with that of the Bachelor's degree programme in engineering sciences: active learning, an equal mix of group work and individual work, and emphasis on the development of non-technical skills.

A major characteristic of the programme is the immersion of students in research laboratories (for class laboratories, case studies, projects, theses) exposing them to advanced methods and allowing them to learn by questioning. This process is very central for a research perspective.

Half of the student workload in the last year consists in the Master thesis fulfillment and offers students the possibility to deeply investigate. Given its size and context it provides a true initiation into the working life of an engineer or researcher.

Diverse learning situations

Learning is achieved by various pedagogical methods such as internships, case studies, classes, projects, exposure to cutting edge research and meetings with key industrial players in the field.

This variety of teaching techniques allows students to learn in an iterative and progressive way.

The business creation major is based on an interactive teaching method and is oriented toward problem-based learning. Throughout the program, students work in multidisciplinary teams to participate in group projects. The Master's thesis is multidisciplinary in nature so that groups of three students, ideally from different academic departments, can work on a business creation project.

Evaluation

The evaluation methods comply with the [regulations concerning studies and exams](#). More detailed explanation of the modalities specific to each learning unit are available on their description sheets under the heading "Learning outcomes evaluation method".

Student work is evaluated according to University rules (see the rules for evaluating coursework and exams) namely written and oral exams, laboratory exams, individual or group work, public presentations of projects and theses defences. Professors provide details about evaluation methods used in their courses at the beginning of each semester.

For more information on evaluation methods, students may consult the relevant evaluation descriptions.

To obtain a passing grade, the marks received for the teaching units are offset by their respective credits.

Mobility and/or Internationalisation outlook

Since its creation, the Louvain School of Engineering (EPL) has participated in diverse [exchange programs](#) that were put into place at the European level and beyond.

Possible trainings at the end of the programme

Accessible complementary Master's degrees: currently under examination.

Accessible PhD curricula : by virtue of its training towards and via research, the Master in biomedical engineering gives its students an excellent preparation towards PhD studies. Instructors involved in the Master are members of various doctoral schools, which are there to welcome students who wish to further their studies via a PhD.

Contacts

Attention, you are currently reading a page of an old programme study. To get up to date contact information, please go to the [current program study](#) site.

Curriculum Management

Entite de la structure GBIO

Acronyme	GBIO
Dénomination	Commission de programme- Ingénieur civil biomédical
Adresse	Place du Levant, 3 bte L5.03.02 1348 Louvain-la-Neuve Tél 010 47 25 86 - Fax 010 47 25 98
Secteur	Secteur des sciences et technologies (SST)
Faculté	Ecole Polytechnique de Louvain (EPL)
Commission de programme	Commission de programme- Ingénieur civil biomédical (GBIO)

Academic Supervisor : Renaud RONSSE

Jury

Président du Jury : Jean-Didier LEGAT

Secrétaire du Jury : Renaud RONSSE

Usefull Contacts

Secrétariat : Isabelle DARGENT

Attention, you are currently reading a page of an old programme study. To get up to date contact information, please got to the [current program study](#) site.

