

# Master of science in Biomedical Engineering

## Focus Professional

The programme is based on the standard three-year format: the third year of the Bachelor programme, followed by two years of a Master programme. Courses are given on the three following main subjects: biomechanics, biomedical instruments, and biomedical imaging. The 3rd year of the Bachelor programme provides basic knowledge in biomedicine and engineering. Then, the 1st year of the Master programme covers the basic material for all three main subjects, while the 2nd year has students choose a series of courses that align more closely with their interests in one of these subjects. Students may also choose to specialise in courses required to become an expert in medical radiophysics; this speciality will give them insight into the use and impact of ionising radiation (radiotherapy, scanners etc.) on living tissue.

### Bachelor – Year 3

In addition to a common core of courses, 30 credits are specific to biomedical engineering: these specialised courses provide basic knowledge in biomedicine (biology, physiology, biochemistry, anatomy) and engineering (instruments, computing, and automation), later developed in the Master programme.

### Master – Year 1

Courses are centred around a 'biomedicine' module (25 credits) and an 'engineering' module (30 credits), which cover the basics of the programme's three core subjects (biomechanics, instruments, imaging) in order to help students choose a specialisation in year 2 based on their personal interests.

The programme is completed by a specific project related to biomedical engineering (5 credits), which can take the form of a biomedical imaging project or a biomechanics project. Alternatively, selected students may complete one of two other types of projects: a biomedical project on development cooperation (see [www.ulb.ac.be/facs/polytech/cooperation-Mission.html](http://www.ulb.ac.be/facs/polytech/cooperation-Mission.html) to learn more about these projects), and a 'team leader' project, where they will supervise a group of 1st-year Bachelor students for their own final project.

### Master – Year 2

For the final year, the programme includes a dissertation, which counts for 20 credits, and three series of classes (modules), each of which is specialised in one of the three main subjects (biomechanics, instrumentation, imaging). By choosing at least 20 credits' worth of courses in two of the three modules, students can align their studies with their interests. Another possibility is to specialise in medical radiophysics, in order to prepare for additional training as an expert in this medical radiophysics.

Students may also complete a work placement (10 credits) in a company or a hospital, in Belgium or abroad, with an additional module and a free module, totalling at least 60 credits. In addition, students take part in 3 events (5 credits): the Biomedical Days (three days of talks hosted by a panel of speakers from the industrial sector, organised jointly with UCL and ULg), the National Day on Biomedical Engineering—including a biomedical job fair—, and the European Course on Laparoscopic Surgery.

Some courses are given in English (the actual number of hours depends on each student's choice of electives).

## Bloc 1 | M-IRCBS | MA-IRCB

## ENGINEERING SCIENCE

ELEC-H310	<a href="#">Digital electronics</a>   Dragomir MILOJEVIC (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 12h, practical work: 24h] 📅 second term 🗣️ English
ELEC-H402	<a href="#">Analog electronics</a>   François QUITIN (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗣️ English
ELEC-H424	<a href="#">Active medical devices</a>   Antoine NONCLERCQ (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 12h, practical work: 24h] 📅 second term 🗣️ English
INFO-H500	<a href="#">Image acquisition and processing</a>   Olivier DEBEIR (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 24h] 📅 first term 🗣️ English
MEDI-H503	<a href="#">Orthopaedic biomechanics</a>   Bernardo INNOCENTI (Coordinator) ⌚ 5 credits [lecture: 48h, tutorial classes: 12h] 📅 second term 🗣️ English
STAT-H400	<a href="#">Multivariate data analysis</a>   Mehrdad TERATANI (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗣️ English

## BIOMEDICAL SCIENCE

BIME-H406	<a href="#">Molecular biology and microbiology</a>   Anne OP DE BEECK (Coordinator), Yvan DE LAUNOIT and Rachel DEPLUS ⌚ 5 credits [lecture: 48h, practical work: 12h] 📅 first term 🗣️ English
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BIME-H407	<b>Introduction to medical imaging and optical microscopy</b>   Olivier DEBEIR (Coordinator) and Simon-Pierre GORZA ⌚ 5 credits [lecture: 48h, tutorial classes: 12h] 📅 first term 🗨 English
BIME-H408	<b>Histology and neurophysiology</b>   Karelle LEROY (Coordinator), David GALL and Serge SCHIFFMANN ⌚ 5 credits [lecture: 60h, practical work: 12h] 📅 first term 🗨 English
BIME-H409	<b>Human Physiology</b>   Nicolas BAEYENS (Coordinator) and Gaël DEBOECK ⌚ 5 credits [lecture: 24h, practical work: 12h] 📅 second term 🗨 English
INFO-H400	<b>Medical Information Systems</b>   DAVID WIKLER (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h, practical work: 12h] 📅 second term 🗨 English

## ENGINEERING PROJECT

1 project to chose out of these 4

### Project to choose

*One course chosen from the following*

MECA-H409 (optional)	<b>Design methodology</b>   Alain DELCHAMBRE (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h, personal assignments: 12h] 📅 first term 🗨 English
PROJ-H417 (optional)	<b>Projet coopération au développement / Development cooperation project</b>   Antoine NONCLERCQ (Coordinator) ⌚ 5 credits [project: 150h] 📅 first and second terms 🗨 French Only on selection : see the Development Unit of the Polytechnic School of Brussels ( <a href="http://polytech.ulb.be/en/international/development-cooperation">http://polytech.ulb.be/en/international/development-cooperation</a> )
PROJ-H418 (optional)	<b>Hands-on learning: project manager (chef de projet)</b>   Peter BERKE (Coordinator) ⌚ 5 credits [project: 150h] 📅 first and second terms 🗨 French
PROJ-H419 (optional)	<b>Biomedical engineering project in image analysis</b>   Olivier DEBEIR (Coordinator) ⌚ 5 credits [project: 150h] 📅 academic year 🗨 English

# Master of science in Biomedical Engineering

## Focus Professional

### Bloc 2 | M-IRCBS | MA-IRCB

## Compulsory commun courses - Block 2

MEMO-H500 [Master thesis in biomedical engineering](#) | Bernardo INNOCENTI (Coordinator)

🕒 20 credits [personal assignments: 600h] 📅 academic year 🗨 English

PROJ-H500 [Biomedical research and industry seminars](#) | Olivier DEBEIR (Coordinator)

🕒 5 credits [lecture: 60h] 📅 academic year 🗨 English

*An alternative chosen from the five following*

## Option Biomechanics and instrumentation

Choose a minimum of 20 credits from the modules 594 and 595

(with a min of 5 ECTS for a module)

*A total of 20 credits chosen from the following*

### Module 594 - Biomechanics

MECA-H501 [Soft microrobotics](#) | Pierre LAMBERT (Coordinator)

(optional)

🕒 5 credits [lecture: 24h, practical work: 24h, personal assignments: 24h] 📅 academic year 🗨 English

MEDI-H504 [Design of Orthopaedic Medical Devices : biomechanics, design and regulation](#) | Bernardo INNOCENTI (Coordinator)

(optional)

🕒 5 credits [lecture: 48h, tutorial classes: 12h] 📅 first term 🗨 English

MEDI-H508 [Fluid mechanics of the cardiovascular and pulmonary systems. From physiology to applications](#) | Benoît HAUT (Coordinator)

(optional)

🕒 5 credits [lecture: 24h, tutorial classes: 12h, practical work: 24h] 📅 first term 🗨 English

### Module 595 - Instrumentation

ELEC-H409 [Digital architectures and design](#) | Dragomir MILOJEVIC (Coordinator)

(optional)

🕒 5 credits [lecture: 12h, practical work: 36h] 📅 first term 🗨 English

ELEC-H410 [Real-time computer systems](#) | François QUITIN (Coordinator)

(optional)

🕒 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗨 English

ELEC-H503 [Artificial organs](#) | Antoine NONCLERCQ (Coordinator)

(optional)

🕒 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗨 English

MATH-H509 [Biomedical robotics](#) | Emanuele GARONE (Coordinator) and Bernardo INNOCENTI

(optional)

🕒 5 credits [lecture: 24h, tutorial classes: 12h, practical work: 24h] 📅 second term 🗨 English

MEDI-H507 [Lab on a chip for biomedical applications](#) | Benoît SCHEID (Coordinator) and Gert DESMET

(optional)

🕒 5 credits [lecture: 24h, tutorial classes: 12h, practical work: 24h] 📅 second term 🗨 English

or

## Option Biomechanics and biomedical image analysis and informatics

Choose a minimum of 20 credits from the modules 594 and 596

(with a min of 5 credits for module)

*A total of 20 credits chosen from the following*

### Module 594 - Biomechanics

- |                         |   |
|-------------------------|---|
| MECA-H501<br>(optional) | <a href="#">Soft microrobotics</a>   Pierre LAMBERT (Coordinator)<br>⌚ 5 credits [lecture: 24h, practical work: 24h, personal assignments: 24h] 📅 academic year 🗣 English   |
| MEDI-H504<br>(optional) | <a href="#">Design of Orthopaedic Medical Devices : biomechanics, design and regulation</a>   Bernardo INNOCENTI (Coordinator)<br>⌚ 5 credits [lecture: 48h, tutorial classes: 12h] 📅 first term 🗣 English                                |
| MEDI-H508<br>(optional) | <a href="#">Fluid mechanics of the cardiovascular and pulmonary systems. From physiology to applications</a>   Benoît HAUT (Coordinator)<br>⌚ 5 credits [lecture: 24h, tutorial classes: 12h, practical work: 24h] 📅 first term 🗣 English |
- ### Module 596 - Biomedical image analysis and informatics
- |                         |   |
|-------------------------|---|
| BINF-F401<br>(optional) | <a href="#">Computational Methods for Functional Genomics</a>   Vincent DETOURS (Coordinator)<br>⌚ 5 credits [lecture: 36h, practical work: 24h] 📅 second term  |
| INFO-H501<br>(optional) | <a href="#">Pattern recognition and image analysis</a>   Olivier DEBEIR (Coordinator) and Christine DECAESTECKER<br>⌚ 5 credits [lecture: 36h, practical work: 24h] 📅 second term 🗣 English             |
| INFO-H502<br>(optional) | <a href="#">Virtual Reality</a>   Gauthier LAFRUIT (Coordinator)<br>⌚ 5 credits [lecture: 24h, practical work: 24h] 📅 first term 🗣 English  |
| INFO-H503<br>(optional) | <a href="#">GPU computing</a>   Gauthier LAFRUIT (Coordinator) and Jan LEMEIRE<br>⌚ 5 credits [lecture: 24h, practical work: 24h, project: 24h] 📅 second term 🗣 English                                 |
| INFO-H516<br>(optional) | <a href="#">Visual Media Compression</a>   Mehrdad TERATANI (Coordinator) and Gauthier LAFRUIT<br>⌚ 5 credits [lecture: 24h, practical work: 24h, personal assignments: 12h] 📅 second term 🗣 English    |
| MEDI-H401<br>(optional) | <a href="#">Radioprotection médicale, y compris les techniques de radiologie</a>   Marc LEMORT (Coordinator)<br>⌚ 2 credits [lecture: 12h, practical work: 12h] 📅 second term 🗣 French                  |
| MEDI-H506<br>(optional) | <a href="#">Magnetic Resonance Imaging and Biomedical Nanotechnology</a>   Gilles BRUYLANTS (Coordinator) and Thierry METENS<br>⌚ 5 credits [lecture: 48h, practical work: 12h] 📅 second term 🗣 English |

or

## Option Instrumentation and biomedical image analysis and informatics

Choose a minimum of 20 credits from the modules 595 and 596

(with a minimum of 5 credits for module)

*A total of 20 credits chosen from the following*

### Module 595 - Instrumentation

- |                         |   |
|-------------------------|---|
| ELEC-H409<br>(optional) | <a href="#">Digital architectures and design</a>   Dragomir MILOJEVIC (Coordinator)<br>⌚ 5 credits [lecture: 12h, practical work: 36h] 📅 first term 🗣 English |
| ELEC-H410<br>(optional) | <a href="#">Real-time computer systems</a>   François QUITIN (Coordinator)<br>⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗣 English         |

ELEC-H503 (optional) **Artificial organs** | Antoine NONCLERCQ (Coordinator)  
⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗨 English

MATH-H509 (optional) **Biomedical robotics** | Emanuele GARONE (Coordinator) and Bernardo INNOCENTI  
⌚ 5 credits [lecture: 24h, tutorial classes: 12h, practical work: 24h] 📅 second term 🗨 English

MEDI-H507 (optional) **Lab on a chip for biomedical applications** | Benoît SCHEID (Coordinator) and Gert DESMET  
⌚ 5 credits [lecture: 24h, tutorial classes: 12h, practical work: 24h] 📅 second term 🗨 English

### Module 596 - Biomedical image analysis and informatics

BINF-F401 (optional) **Computational Methods for Functional Genomics** | Vincent DETOURS (Coordinator)  
⌚ 5 credits [lecture: 36h, practical work: 24h] 📅 second term

INFO-H501 (optional) **Pattern recognition and image analysis** | Olivier DEBEIR (Coordinator) and Christine DECAESTECKER  
⌚ 5 credits [lecture: 36h, practical work: 24h] 📅 second term 🗨 English

INFO-H502 (optional) **Virtual Reality** | Gauthier LAFRUIT (Coordinator)  
⌚ 5 credits [lecture: 24h, practical work: 24h] 📅 first term 🗨 English

INFO-H503 (optional) **GPU computing** | Gauthier LAFRUIT (Coordinator) and Jan LEMEIRE  
⌚ 5 credits [lecture: 24h, practical work: 24h, project: 24h] 📅 second term 🗨 English

INFO-H516 (optional) **Visual Media Compression** | Mehrdad TERATANI (Coordinator) and Gauthier LAFRUIT  
⌚ 5 credits [lecture: 24h, practical work: 24h, personal assignments: 12h] 📅 second term 🗨 English

MEDI-H401 (optional) **Radioprotection médicale, y compris les techniques de radiologie** | Marc LEMORT (Coordinator)  
⌚ 2 credits [lecture: 12h, practical work: 12h] 📅 second term 🗨 French

MEDI-H506 (optional) **Magnetic Resonance Imaging and Biomedical Nanotechnology** | Gilles BRUYLANTS (Coordinator) and Thierry METENS  
⌚ 5 credits [lecture: 48h, practical work: 12h] 📅 second term 🗨 English

or

## Option Biomedical image analysis and informatics

Choisir un minimum de 20 crédits dans le module 596

### Module 596 - Biomedical image analysis and informatics

*A total of 20 credits chosen from the following*

BINF-F401 (optional) **Computational Methods for Functional Genomics** | Vincent DETOURS (Coordinator)  
⌚ 5 credits [lecture: 36h, practical work: 24h] 📅 second term

INFO-H501 (optional) **Pattern recognition and image analysis** | Olivier DEBEIR (Coordinator) and Christine DECAESTECKER  
⌚ 5 credits [lecture: 36h, practical work: 24h] 📅 second term 🗨 English

INFO-H502 (optional) **Virtual Reality** | Gauthier LAFRUIT (Coordinator)  
⌚ 5 credits [lecture: 24h, practical work: 24h] 📅 first term 🗨 English

INFO-H503 (optional) **GPU computing** | Gauthier LAFRUIT (Coordinator) and Jan LEMEIRE  
⌚ 5 credits [lecture: 24h, practical work: 24h, project: 24h] 📅 second term 🗨 English

MEDI-H506 (optional) **Magnetic Resonance Imaging and Biomedical Nanotechnology** | Gilles BRUYLANTS (Coordinator) and Thierry METENS  
⌚ 5 credits [lecture: 48h, practical work: 12h] 📅 second term 🗨 English

or

## Option Medical radiophysics

Choose a minimum of 25 credits

*A total of 25 credits chosen from the following*

INFO-H501 (optional)	<b>Pattern recognition and image analysis</b>   Olivier DEBEIR (Coordinator) and Christine DECAESTECKER ⌚ 5 credits [lecture: 36h, practical work: 24h] 📅 second term 🗨 English
MEDI-H401 (optional)	<b>Radioprotection médicale, y compris les techniques de radiologie</b>   Marc LEMORT (Coordinator) ⌚ 2 credits [lecture: 12h, practical work: 12h] 📅 second term 🗨 French
MEDI-H502 (optional)	<b>Eléments de physique et chimie nucléaire</b>   Nicolas PAULY (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 12h, practical work: 24h] 📅 first term 🗨 French
PHYS-H407 (optional)	<b>Nuclear measurement techniques</b>   Nicolas PAULY (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗨 English
PHYS-H409 (optional)	<b>Physical principles of magnetic resonance imaging</b>   Thierry METENS (Coordinator) ⌚ 3 credits [lecture: 22h, tutorial classes: 2h, practical work: 6h] 📅 second term 🗨 English
PHYS-H501 (optional)	<b>Introduction to medical physics</b>   Nicolas PAULY (Coordinator) and Stéphane SIMON ⌚ 3 credits [lecture: 12h, tutorial classes: 12h, practical work: 12h] 📅 first term 🗨 English
PHYS-H516 (optional)	<b>Physical aspects of radiation protection</b>   Stéphane SIMON (Coordinator) and Nicolas PAULY ⌚ 3 credits [lecture: 12h, tutorial classes: 12h, practical work: 12h] 📅 first term 🗨 French
PHYS-H518 (optional)	<b>Radiobiology, biological and genetic effects of radiations</b>   Nicolas PAULY (Coordinator) and Sébastien Penninckx ⌚ 1 credit [lecture: 12h] 📅 second term 🗨 French
PHYS-H519 (optional)	<b>Legal and regulatory aspects of radiation protection</b>   Thibault Vanaudenhove (Coordinator) ⌚ 1 credit [lecture: 12h] 📅 second term 🗨 French
PHYS-H520 (optional)	<b>Effets médicaux de l'exposition aux rayonnements ionisants</b>   Nicolas PAULY (Coordinator) and Dirk VAN GESTEL ⌚ 1 credit [lecture: 12h] 📅 second term 🗨 French

## Electives courses

Choose a module

Electives courses for Option Biomechanics and instrumentation or Option Biomechanics and biomedical image analysis and informatics or Option Instrumentation and biomedical image analysis and informatics or Option Biomedical image analysis and informatics

Choose 2 to 15 credits (max 5 credits in EPB, Faculté de Médecine, Faculté des sciences de la motricité, Modules transversaux)

*2 to 15 credits chosen from the following*

BIME-G5505 (optional)	<b>Interfaculty and interdisciplinary program in Healthcare Innovation</b>   Hilde STEVENS (Coordinator) ⌚ 5 credits [lecture: 40h, tutorial classes: 20h] 📅 second term 🗨 English
BIME-Y500 (optional)	<b>Regulatory affairs for medical devices</b> ⌚ 5 credits [lecture: 48h, project: 12h] 📅 second term 🗨 English
BIME-Y501 (optional)	<b>Clinical evaluation of medical devices</b> ⌚ 5 credits [lecture: 24h, tutorial classes: 12h, project: 24h] 📅 first term 🗨 English

BING-H5000 (optional)	<b>Introduction à la bioinformatique et à ses applications</b>   Dimitri GILIS (Coordinator) and Fabrizio PUCCI ⌚ 5 credits [lecture: 36h, practical work: 24h] 📅 first term 🗨 French
CHIM-F4001 (optional)	<b>Rational drug design and PKPD modeling</b>   Jean-Christophe LELOUP (Coordinator) and Martine PREVOST ⌚ 5 credits [lecture: 36h, tutorial classes: 12h, project: 24h] 📅 second term 🗨 English
ELEC-H417 (optional)	<b>Communication networks : protocols and architectures</b>   Jean-Michel DRICOT (Coordinator) ⌚ 5 credits [lecture: 36h, practical work: 24h] 📅 first term 🗨 English
ELEC-H516 (optional)	<b>Industrial Automation</b>   Dragomir MILOJEVIC (Coordinator) ⌚ 3 credits [lecture: 12h, practical work: 24h] 📅 first term 🗨 English
ENVI-L4110 (optional)	<b>Compartiments environnementaux, production, consommation et leurs impacts sur la santé</b>   Olivier VANDENBERG (Coordinator) and Valérie ROORYCK ⌚ 5 credits [lecture: 12h, practical work: 48h] 📅 second term 🗨 French
GEST-S423 (optional)	<b>IP Management and Technology Transfer (Chaire Solvay)</b>   Bruno VAN POTTELSBERGHE (Coordinator) and Frédéric DE CONINCK ⌚ 5 credits [lecture: 24h, tutorial classes: 12h] 📅 second term 🗨 English
INFO-H509 (optional)	<b>Geo-Spatial and web technologies</b>   Mahmoud SAKR (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 12h] 📅 second term 🗨 English
INFO-H515 (optional)	<b>Big Data: Distributed Data Management and Scalable Analytics</b>   Dimitrios SACHARIDIS (Coordinator) and Gianluca BONTEMPI ⌚ 5 credits [lecture: 24h, tutorial classes: 12h, project: 24h] 📅 second term 🗨 English
MATH-H503 (optional)	<b>Model-Based and Data-Driven Fault Detection and Isolation</b>   Michel KINNAERT (Coordinator) ⌚ 4 credits [lecture: 24h, practical work: 24h] 📅 second term 🗨 English
MECA-H409 (optional)	<b>Design methodology</b>   Alain DELCHAMBRE (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h, personal assignments: 12h] 📅 first term 🗨 English
MECA-H411 (optional)	<b>Mechanical Vibrations</b>   Arnaud DERAEMAER (Coordinator) and Wout Weijtjens ⌚ 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨 English
STAG-H500 (optional)	<b>Internship (3 months)</b>   Frédéric ROBERT (Coordinator) ⌚ 10 credits [work placement: 300h] 📅 first term 🗨 French

## Elective courses for Option Medical Radiophysics

*A total of ten credits chosen from the following*

BIME-G5505 (optional)	<b>Interfaculty and interdisciplinary program in Healthcare Innovation</b>   Hilde STEVENS (Coordinator) ⌚ 5 credits [lecture: 40h, tutorial classes: 20h] 📅 second term 🗨 English
ENVI-L4110 (optional)	<b>Compartiments environnementaux, production, consommation et leurs impacts sur la santé</b>   Olivier VANDENBERG (Coordinator) and Valérie ROORYCK ⌚ 5 credits [lecture: 12h, practical work: 48h] 📅 second term 🗨 French
GEST-S423 (optional)	<b>IP Management and Technology Transfer (Chaire Solvay)</b>   Bruno VAN POTTELSBERGHE (Coordinator) and Frédéric DE CONINCK ⌚ 5 credits [lecture: 24h, tutorial classes: 12h] 📅 second term 🗨 English
MATH-F502 (optional)	<b>Imagerie et problèmes inverses</b>   Ignace LORIS (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 12h] 📅 second term 🗨 French
MATH-H507 (optional)	<b>Monte Carlo Methods</b>   Pierre-Etienne LABEAU (Coordinator) ⌚ 2 credits [lecture: 12h, tutorial classes: 12h] 📅 first term 🗨 English
STAG-H500 (optional)	<b>Internship (3 months)</b>   Frédéric ROBERT (Coordinator) ⌚ 10 credits [work placement: 300h] 📅 first term 🗨 French

## Free elective courses

Students have also the opportunity to choose courses among the courses of the 'transversal modules' of the School.

English : LANG-H500

Engineering and society : PROJ-H421 - GEST-H509 - BIME-G5505 - PHYS-F517

Sustainability : GEST-S492 - ENVI-F405 - CHIM-H504 - ENVI-F452 - ENVI-F454 - ELEC-Y514

Finance, accounting, management, marketing, logistics and quality : GEST-S101 - GEST-S318 - GEST-S421 - GEST-Y501 - GEST-H501 - GEST-H502

Participation to a summer school : EDUC-H601

## Free elective courses

*Up to six credits chosen from the following*

BIME-G5505 (optional)	<b>Interfaculty and interdisciplinary program in Healthcare Innovation</b>   Hilde STEVENS (Coordinator) ⌚ 5 credits [lecture: 40h, tutorial classes: 20h] 📅 second term 🗨 English
CHIM-H504 (optional)	<b>Engineering aspects of circular economy</b>   Prakash VENKATESAN (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗨 English
DROI-C5174 (optional)	<b>Approche interdisciplinaire du droit de la propriété intellectuelle/Interdisciplinary Approach to In</b>   Julien CABAY (Coordinator) ⌚ 5 credits [lecture: 24h] 📅 first term 🗨 English/French
EDUC-H601 (optional)	<b>Summer School</b>   Johan GYSELINCK (Coordinator) ⌚ 5 credits [personal assignments: 5h] 📅 academic year 🗨 English
ELEC-Y514 (optional)	<b>Sustainability : an interdisciplinary Approach</b>   Cathy MACHARIS (Coordinator) and Waldo Galle ⌚ 6 credits [lecture: 36h, practical work: 24h, personal assignments: 100h] 📅 academic year 🗨 English
ENVI-F405 (optional)	<b>Climat: sciences et politiques</b>   Frank PATTYN (Coordinator) and Louise Knops ⌚ 5 credits [lecture: 40h] 📅 second term 🗨 French
ENVI-F452 (optional)	<b>Environmental impact analysis and management</b>   Wouter ACHTEN (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 12h, project: 24h] 📅 first term 🗨 English/French
ENVI-F454 (optional)	<b>Energie: Société et environnement</b>   Michel HUART (Coordinator) and Nadine MATTIELLI ⌚ 5 credits [lecture: 30h, practical work: 12h, project: 24h] 📅 first term 🗨 French
GEST-H501 (optional)	<b>Logistics Engineering and Management</b>   Alassane Ballé NDIAYE (Coordinator) ⌚ 5 credits [lecture: 12h, tutorial classes: 36h] 📅 first term 🗨 English
GEST-H502 (optional)	<b>Supply Chain Performance Analytics</b>   Alassane Ballé NDIAYE (Coordinator) ⌚ 5 credits [lecture: 12h, tutorial classes: 36h, personal assignments: 12h] 📅 second term 🗨 English
GEST-H509 (optional)	<b>Ethique de l'ingénieur</b> ⌚ 3 credits [lecture: 12h, tutorial classes: 12h, practical work: 12h] 📅 second term 🗨 French
GEST-S101 (optional)	<b>Comptabilité financière</b>   Laurent GHEERAERT (Coordinator) and Gilles GEVERS ⌚ 5 credits [lecture: 36h, tutorial classes: 8h] 📅 second term 🗨 French
GEST-S318 (optional)	<b>Introduction to theoretical finance</b>   Laurent GHEERAERT (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
GEST-S421 (optional)	<b>Entrepreneurial ecosystems</b>   Judith BEHRENS (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
GEST-S492 (optional)	<b>Energy policy, sustainability &amp; management</b>   Adel EL Gammal (Coordinator), Julien BLONDEAU and Michel HUART ⌚ 5 credits [lecture: 36h, seminars: 24h] 📅 first term 🗨 English
GEST-Y501 (optional)	<b>Business Management and Entrepreneurship</b>   Marc GOLDCHSTEIN (Coordinator) ⌚ 3 credits [lecture: 33h] 📅 first term 🗨 English
LANG-H500 (optional)	<b>English for professional purposes</b>   Alexander CORNFORD (Coordinator) ⌚ 5 credits [tutorial classes: 48h, personal assignments: 12h] 📅 first and second terms 🗨 English



PROJ-H421  
(optional)

Projet polydaire: expériences didactiques innovantes pour le secondaire | Simon-Pierre GORZA (Coordinator)

🕒 5 credits [project: 150h] 📅 academic year 🗨️ French

