BIRE2M

2014 - 2015

Master [120] in Environmental Bioengineering

At Louvain-la-Neuve - 120 credits - 2 years - Day schedule - In french
Dissertation/Graduation Project : **YES** - Internship : **optional**
Activities in English: **YES** - Activities in other languages : **NO**
Activities on other sites : **NO**
Organized by: **Faculté des bioingénieurs (AGRO)**
Programme code: **bire2m** - European Qualifications Framework (EQF): 7

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Learning outcomes

Master in Bioengineering in Environmental Sciences and Technologies students must endeavour to diagnose and solve complex and original issues in bioengineering through a multidisciplinary approach in order to develop and implement innovative and sustainable solutions.

This Master's programme aims to train experts in the field of management, conservation and the responsible use of natural renewable resources (land and water) as well as natural and man-made ecosystems.

The future bioengineers acquire the knowledge and skills required to become:

• professionals able to tackle and diagnose environmental problems: the management and use of resources (soil, water, plants) and ecosystems, land management;

• scientists able to understand complex processes on different scales, used to multidisciplinary approaches and able to collaborate with other specialists;

• innovators tasked with developing new resource management methods that respect the environment.

Highly versatile and multidisciplinary in character, the course dispensed by the **Faculty of Bioscience Engineering** focuses on acquiring skills which combine theory and practice to train "bioengineers" mastering a broad base of scientific and technological knowledge and skills allowing them to understand and conceptualise biological, agricultural and environmental systems.

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

1. To explore an integrated body of knowledge (knowledge, methods and techniques, models and processes) in natural and human sciences which serves as the foundation from which to operate with expertise in the field of environmental science and technology.

1.1 To build an advanced knowledge base in the field of environmental science and technologies and more specifically in the following disciplines[1].

- Soil and water sciences and quality
- Ecology
- Geomatics applied to the environment
- Analysis of natural and agrarian systems
- Statistics and data analysis

1.2 To build highly specialised (cutting-edge) scientific knowledge in one of the [2] following bioengineering specialisations:

- Environmental technology: water-soil-earth
- Land management
- Water and land resources
- Information analysis and management in biological engineering

1.3 To master procedural skills in conducting experiments[3] in a controlled or natural environment, and in the observation and monitoring of natural and man-made systems at different scales using specific techniques related to their choice of specialisation.

1.4 To apply their knowledge critically to tackle a complex environmental problem, by incorporating processes at different scales ranging from the mineral and living organism scale, to landscape and biosphere.

1.5 To apply multiple strands of knowledge to resolve a multidisciplinary environmental problem in order to develop relevant and innovative solutions.

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[1] Refers to the choice of the Master (core subjects and professional focus). The knowledge of some of these disciplines will have been partially acquired in the Bachelor's degree (in the advanced minor).

[2] Refers to the option / module choice in the Master.

[3] Refers to mastering all the laboratory and field techniques used for the characterisation or monitoring of a system.

2. To explore an integrated body of "engineering and management knowledge" which serves as the foundation from which to operate with expertise in the field of environmental sciences.

2.1 To build an advanced knowledge base (e.g.: concepts, laws, technologies) and tools (e.g. modelling, programming) in engineering sciences:

- Geomatics applied to the environment
- Hydrology
- Applied soil sciences

- Topometry and photogrammetry
- Ecological and environmental diagnosis
- Environmental statistical data analysis
- Support for decision-making and project management

2.2 To build and master highly specialised knowledge and tools in one of the following bioengineering specialisations:

- Environmental technology: water-soil-earth
- Land management
- Water and land resources
- Information analysis and management in biological engineering

2.3 To master the operational use of specialised tools in engineering sciences (e.g.: systems analysis, statistical analysis, programming, modelling, etc.)[1] :

- Measurement techniques
- Environmental statistical data analysis
- Specific tools in relation to the choice of specialisation

2.4 To activate and apply their knowledge of engineering with a critical mind and using a quantitative approach to tackle a complex problem in the environmental field by incorporating processes at different scales ranging from the mineral and living organism scale, to landscape and biosphere.

2.5 To locate and understand how companies and organisations operate, including the role of the different players, their financial and social realities and responsibilities and the challenges and constraints which characterise their environment.

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[1] The tools are explained on the basis of the radioscopy of the programme and courses.

3. To design and execute a research project, implementing an analytical scientific and, if applicable, systematic approach, to further understanding of an original research problem in their field of specialisation, incorporating several disciplines.

This skill set will develop throughout the 5 years. Amongst others it requires the use of a set of skills as described below. These skills correspond in fact to the different stages of the scientific approach.

The majority of these skills are developed in the Bachelor and Master programmes, with differentiation predominately on 3 levels:

- the level of detail and complexity applied to the scientific problem/research studied;
- the degree of innovation shown by the student;
- the degree of autonomy demonstrated by the student throughout the process.

3.1 To summarise the state of knowledge on a complex research problem which relates to their choice of specialisation: to research information, to select and validate its reliability based on the nature of the source of the information and comparing several sources.

3.2 To specify and define the research question.

3.3 To examine the research question using conceptual abstraction and formulate hypotheses.

3.4 To develop and implement a rigorous methodology to answer the research question.

3.5 To master and apply statistical data analysis tools in the context of a complex scientific issue.

3.6 To analyse and interpret the results to produce a substantiated critique on a complex scientific question.

3.7 To demonstrate an ability to summarise and formulate conclusions on a complex scientific question.

3.8 In each of the skills mentioned above, to demonstrate rigour, precision and the critical thinking essential for any scientific method.

3.9 To demonstrate innovation in at least one of the skills mentioned above.

4. To formulate and resolve a complex environmental engineering problem related to new situations presenting a degree of uncertainty. The student will be able to design appropriate, sustainable and innovative solutions through a systematic approach. This problem may be related to the management and use of resources (soil, water, plant) and ecosystems, to land management, to the impact of human activities on the capacity of the environment to provide goods and services to humanity.

4.1 To strategically differentiate the key elements from the less critical elements relating to a complex environmental engineering problem, in order to define and determine the field of action for this problem.

4.2 To identify the knowledge acquired and that to be acquired to resolve the complex environmental engineering problem.

4.3 To analyse a complex environmental engineering problem using a systematic and multidisciplinary approach in order to carry out diagnostics and formulate the specifications.

4.4 To demonstrate an ability for conceptual abstraction and formalisation in analysing and resolving the complex environmental engineering problem.

4.5 To develop scientifically and technologically relevant and innovative solutions, through a multidisciplinary (integration and articulation of knowledge) and quantitative approach, making it possible to develop products, systems, processes or services in the field of environmental sciences and technologies.

4.6 To test solutions and evaluate their impact in relation to an economic, environmental, social and cultural context.
4.7 To formulate concrete and responsible recommendations to encourage sustainable development in relation to the efficient operational and sustainable implementation of the solutions proposed.

5. To design and implement a multidisciplinary project, alone and in a team, with the stakeholders concerned while taking the objectives into account and incorporating the scientific, technical, environmental, economic and human factors.

5.1 To know and understand the principles and factors of group dynamics (including the constructive role of conflict).
5.2 To know and understand the project management process (project cycles): formulation and definition of the project, project management, monitoring and evaluation of the project.
5.3 To situate a multidisciplinary project within its environment and identify the issues, constraints and stakeholders and to clearly define its objectives.
5.4 To plan and develop all the stages of a multidisciplinary project, alone and in a team, and to work together after having allocated the tasks.
5.5 To involve key players at appropriate stages in the process.
5.6 To work within a team and collaborate effectively to achieve common objectives.
5.7 To take and assume the decisions required for the effective project management either alone or in a team in order to achieve the intended objectives.
5.8 To recognise and take into consideration the diversity of opinions and ways of thinking of team members and to manage conflict constructively to work towards a consensual decision.
5.9 To lead a team (demonstrate leadership): to motivate team members, to develop a collaborative climate, to guide them to cooperate in the achievement of a common objective, to manage conflict.

6. To communicate, interact and convince in a professional manner, in French and English at level C1 (Common European Framework of Reference for Languages published by the Council of Europe), both verbally and in writing, adapting to their conversational partners and the context.

6.1 To understand and use scientific articles and advanced technical documents in French and English.
6.2 To communicate information, ideas, solutions and conclusions as well as the knowledge and underlying principles, in a clearly structured, substantiated, concise and comprehensive way (as appropriate) both verbally and in writing according to the standards of communication specific to the context and by adapting their presentation according to the level of expertise of the audience.
6.3 To develop logic diagrams to concisely pose complex global questions.
6.4 To communicate the state of knowledge in a specific field concisely and critically.
6.5 To communicate results and conclusions, and to support a message, in an appropriate manner using scientific tables, graphs and diagrams.
6.6 To communicate effectively and respectfully with various stakeholders, demonstrating listening skills, empathy and assertiveness.
6.7 To argue and convince: to understand the points of view of various stakeholders and present their arguments accordingly.
6.8 To master the IT and technological tools essential for professional communication.
6.9 To learn English to level C1 according to the European Framework.

7. To act critically and responsibly by taking account of sustainable development issues and operating with a humanistic outlook.

7.1 To demonstrate intellectual independence of thought, to examine knowledge and professional practices and trends critically.
7.2 To make decisions and act in society with respect for ethical values and in compliance with laws and conventions.
7.3 To make decisions and act responsibly by factoring in sustainable development values.
7.4 To make decisions and act with respect for humanistic values, cultural openness and solidarity, especially in North–South relations.
7.5 To assume professional responsibilities and act in a managerial capacity vis-à-vis their colleagues.

8. To demonstrate independence and be proactive in acquiring new knowledge and developing new skills in order to adapt to changing or uncertain situations and to grow, to build a professional project within a continuing development approach.

8.1 To manage their work independently: to set priorities, anticipate and plan all the activities in time, including in the face of changing, uncertain or urgent situations.
8.2 To manage stress and frustrations in urgent, changing, inconsistent or uncertain situations.

8.3 To question and know themself: to undergo self-assessment, by analysing their successes and failures, to identify strengths and weaknesses and their personal performance in relation to the context.

8.4 To grow personally and professionally: to build a professional project in line with their own values and aspirations, to manage their motivation and involvement in bringing the project to fruition, to persevere in complex situations.

8.5 To independently identify and absorb new knowledge and skills essential for learning to understand new contexts quickly.

8.6 To commit to the lifelong learning which will allow them to grow socially and professionally.

Programme structure

This programme comprises a series of activities totalling 120 credits spread over two years worth 60 credits each. It is structured as follows :

Year 1 :

â€¢ **professional focus programme** 30 credits (compulsory)

â€¢ **choice of one option course for 30 credits from five available.** Certain option courses are organized jointly with one or two of the other Masters in Bioengineering programmes. This is the reason for the special numbering of these option courses. (For example, option course 4E is also in the programme for the Master in Agronomic Science where it is called option course 4A; option course 10E is also in the programme for the Master in Agronomic Science where it is called option course 10A and the Master in Chemistry and Bioindustry where it is called option course 10C.)

Year 2 :

â€¢ core subjects programme of 38 credits (compulsory)

â€¢ **choice of one module of 22 credits from six advanced modules: each of the first five modules follow on from the option courses in Year 1. Students are strongly recommended to have studied the corresponding option course in Year 1 if they wish to continue in Year 2. The sixth module is generalist in nature and may be taken to follow on from any option course.**

Optional subjects :

There are some optional courses within the programme. They may either be chosen from a suggested list or may be chosen freely from all the courses available at UCL or even at another institution. The same applies to all the optional courses in the programme.

All these choices must be made in the timescale laid down by the Faculty Department and agreed by the Academic Secretary. For courses from another faculty or institution, students must gain prior agreement from the lecturer in charge of the course.

Additional training "Business Creation"

Students enrolled on the Master in Bioengineering programme have the possibility of taking a module of interdisciplinary training entitled "Business Creation". This additional programme features in the Master programmes of various faculties (Bioengineering, Law, Business Management, Civil Engineering, Psychology). It is designed to provide students, as potential creators, with the tools for analysis and understanding which will help them to appreciate how entrepreneurship works when creating or taking on a business and develop projects of this kind within existing organizations.

In addition, this training enables students to gain familiarity with other disciplines and to learn how to work in multidisciplinary teams.

For further information :

- on the training programme, please refer to : https://www.uclouvain.be/cpme.html
- on how the Master in Bioengineering programmes work, please contact the Faculty Office.

Whatever the focus or the options chosen, the programme of this master shall totalize 120 credits, spread over two years of studies each of 60 credits.

> Tronc commun *[en-prog-2014-bire2m-lbire200t.html]*

> Professional focus *[en-prog-2014-bire2m-lbire200s]*

Options courses

> Options *[en-prog-2014-bire2m-lbire950r.html]*
- > Environmental Technology : Water, Earth, Air (Option 4E) *[en-prog-2014-bire2m-lbire204o.html]*
- > Land Development (Option 5E) *[en-prog-2014-bire2m-lbire205o.html]*
- > Water and Earth Resources (Option 7E) *[en-prog-2014-bire2m-lbire207o.html]*
- > Information Analysis and Management in Biological Engineering (Option 10E - AGI) *[en-prog-2014-bire2m-lbire210o.html]*

> Modules d'approfondissement *[en-prog-2014-bire2m-lbire960r.html]*
- > Advanced Module in Environmental Technology : Water, Earth, Air *[en-prog-2014-bire2m-lbire224o.html]*
- > Advanced Module in Land Development *[en-prog-2014-bire2m-lbire225o.html]*
- > Advanced Module in Water and Earth Resources *[en-prog-2014-bire2m-lbire227o.html]*
- > Advanced module in Information Analysis and Management in Biological Engineering *[en-prog-2014-bire2m-lbire230o.html]*
- > Advanced module in Environmental Science and Technology *[en-prog-2014-bire2m-lbire240o.html]*
- > Module in Business Creation *[en-prog-2014-bire2m-lbire250o.html]*

BIRE2M Detailled programme

Programme by subject

CORE COURSES [38.0]

O Mandatory	⊠ Optional
△ Courses not taught during 2014-2015	⊘ Periodic courses not taught during 2014-2015
⊕ Periodic courses taught during 2014-2015	⧺ Two years course

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

Les étudiants qui choisissent le module Création d'entreprises (m13) réalisent leur mémoire dans le cadre de la formation interdisciplinaire CPME.

						Year 1	Year 2
O LBIRE2200	Master thesis	N.		27 Credits			x
O LBIRE2210	Master thesis' accompanying seminar	Charles Bielders, Patrick Bogaert (coord.), Jacques Mahillon, Caroline Vincke	30h	3 Credits	1 + 2q		x
O LBIRE2204	Territorial diagnostic and decision aid	Pierre Defourny (coord.), Frédéric Gaspart, Jean-Paul Malingreau	22.5h	3 Credits	2q		x
O LBIRE2205	Decision Tools and Project Management	Olivier Cogels, Frédéric Gaspart (coord.)	30h+7.5h	3 Credits	1q		x
O ***Religious Sciences: one course to choose among the following: (2 credits)***							
⊠ 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	Philippe Cochinaux	15h	2 Credits	1q	x	x

PROFESSIONAL FOCUS [30.0]

O Mandatory	⊠ Optional
△ Courses not taught during 2014-2015	⊘ Periodic courses not taught during 2014-2015
⊕ Periodic courses taught during 2014-2015	⧺ Two years course

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

						Year 1	Year 2
O LBIRE2101	Statistical analysis of spatial and temporal data	Patrick Bogaert	22.5h +15h	3 Credits	2q	x	
O LBIRE2102	Applied Geomatic	Pierre Defourny	30h +22.5h	4 Credits	1q	x	
O LBIRE2103	General hydrology	Charles Bielders, Marnik Vanclooster (coord.)	30h +22.5h	5 Credits	1q	x	

						Year 1	Year 2
LBIRE2104	Applied soil sciences	Jean-Thomas Cornélis (compensates Bruno Delvaux), Bruno Delvaux	30h +22.5h	5 Credits	2q	x	
LBIRE2105	Water and soil quality	Henri Halen, Xavier Rollin (coord.)	30h+7.5h	3 Credits	2q	x	
LBIRE2106	Topometry and photogrammetry	Pierre Defourny (coord.), Sébastien Lambot, Julien Radoux (compensates Pierre Defourny)	22.5h +22.5h	4 Credits	2q	x	
LBIRA2109A	Agrarian systems and farm : partim	Pierre Bertin	22.5h +7.5h	3 Credits	1q	x	
LSTAT2110A	Analyse des données	Christian Hafner, Johan Segers	15h+7.5h	3 Credits	1q	x	

OPTIONS

Les étudiants de ce programme ont le choix entre 4 options différentes et 6 modules d'approfondissement. L'accès d'une option à un module est libre. Cependant certains modules d'approfondissement s'articulent mieux autour de certaines options. Les étudiants sont invités dès lors à réfléchir dès la première année de master à la meilleure combinaison de leur programme.

Les étudiants qui souhaitent suivre le module interdisciplinaire en Création d'entreprise (CPME) doivent s'y inscrire en même temps qu'à l'option dès la première année de master. En effet, le programme de ce module devra s'articuler avec celui de l'option sur les deux années de master. Attention: l'inscription à ce module fait l'objet d'une sélection. Ce n'est qu'après avoir reçu l'accord de participation à ce programme que les étudiants pourront prendre contact avec le vice-doyen pour aménager leur programme de cours personnel et répartir les cours CPME et les cours d'option sur les deux années du master.

Au sein de ce programme, des cours sont proposés au choix. Ils sont à choisir au sein d'une liste ou peuvent faire l'objet d'un choix totalement libre dans le portefeuille de cours de l'UCL, voire d'une autre institution. Tous ces choix doivent être validés par le vice-doyen et/ou avoir reçu l'accord préalable du titulaire du cours, si le cours est emprunté dans une autre faculté ou institution.

Options

> Environmental Technology : Water, Earth, Air (Option 4E) *[en-prog-2014-bire2m-lbire204o]*
> Land Development (Option 5E) *[en-prog-2014-bire2m-lbire205o]*
> Water and Earth Resources (Option 7E) *[en-prog-2014-bire2m-lbire207o]*
> Information Analysis and Management in Biological Engineering (Option 10E - AGI) *[en-prog-2014-bire2m-lbire210o]*

Modules d'approfondissement

> Advanced Module in Environmental Technology : Water, Earth, Air *[en-prog-2014-bire2m-lbire224o]*
> Advanced Module in Land Development *[en-prog-2014-bire2m-lbire225o]*
> Advanced Module in Water and Earth Resources *[en-prog-2014-bire2m-lbire227o]*
> Advanced module in Information Analysis and Management in Biological Engineering *[en-prog-2014-bire2m-lbire230o]*
> Advanced module in Environmental Science and Technology *[en-prog-2014-bire2m-lbire240o]*
> Module in Business Creation *[en-prog-2014-bire2m-lbire250o]*

OPTIONS

ENVIRONMENTAL TECHNOLOGY : WATER, EARTH, AIR (OPTION 4E) [30.0]

O Mandatory	⊠ Optional
△ Courses not taught during 2014-2015	⊘ Periodic courses not taught during 2014-2015
⊕ Periodic courses taught during 2014-2015	⧺ Two years course

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

						Year 1	Year 2
O LBIR1311	Thermodynamics	Yann Bartosiewicz	30h+15h	4 Credits	1q	x	
O LBIR1319	Surface and colloid chemistry	Christine Dupont	30h	3 Credits	2q	x	
O LBIRC2109	Process engineering : unit operations	Damien Debecker	60h+15h	6 Credits	2q	x	
O LBRES2103	Soil physics	Charles Bielders (coord.), Mathieu Javaux	30h+15h	4 Credits	1q	x	
O LBRTE2101	Aquatic and soil biological and physical chemistry	Pierre Delmelle, Patrick Gerin (coord.)	37.5h +15h	5 Credits	1q	x	
O LBRTE2102	Integrated exercises in environmental science and technology	Patrick Gerin, Mathieu Javaux, Marnik Vanclooster (coord.)	45h	4 Credits	1 + 2q	x	

Cours au choix pour 4 crédits minimum parmi les intitulés suivants :

						Year 1	Year 2
⊠ LBRES2102	Soil hydrodynamics : modelling	Sébastien Lambot, Marnik Vanclooster (coord.)	30h +22.5h	5 Credits	2q	x	
⊠ LMAPR2690	Valorisation and Treatment of Solid Wastes	N.	22.5h	2 Credits	1q △	x	
⊠ LAUCE2191	Hydrogeology and Geoenvironment	Pierre-Yves Bolly, Alain Holeyman	40h+10h	5 Credits	2q	x	
⊠ LMAPR2647	Sustainable treatment of industrial and domestic waste: Fundamentals	Jacques Devaux, Olivier Françoisse, Patricia Luis Alconero, Olivier Noiset	30h+15h	5 Credits	1q	x	
⊠ LMAPR2648	Sustainable treatment of industrial and domestic waste: Case studies	Spyridon Agathos, Damien Debecker, Olivier Françoisse, Patricia Luis Alconero, Olivier Noiset	30h+15h	5 Credits	1q	x	

LAND DEVELOPMENT (OPTION 5E) [30.0]

O Mandatory	⊠ Optional
△ Courses not taught during 2014-2015	⊘ Periodic courses not taught during 2014-2015
⊕ Periodic courses taught during 2014-2015	⧺ Two years course

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

						Year 1	Year 2
O LAUCE2965	Introduction au droit de l'urbanisme et de l'aménagement du territoire	Francis Haumont	15h	2 Credits	1q	x	
O LDROP2061	Sustainable Development Law	Francis Haumont	30h	3 Credits	2q	x	
O LBIRA2105	Agricultural and rural policies	Bruno Henry de Frahan	30h	3 Credits	1q	x	
O LBRAT2101	Suburban and rural space development	Pierre Defourny (coord.), Xavier Delmon (compensates Pierre Defourny), Yves Hanin, Bertrand Ippersiel (compensates Pierre Defourny), Anne-Laure Jacquemart	45h +22.5h	6 Credits	1q	x	
O LBRAT2102	Spatial modelling of territorial dynamics	Pierre Defourny	15h+15h	3 Credits	2q	x	
O LBRAT2103	Rural sociology and land development	Daniel Bodson	30h	3 Credits	1q	x	
O LBIRF2104A	Phytosociologie	Anne-Laure Jacquemart, Quentin Ponette, Caroline Vincke	15h+30h	4 Credits	2q	x	

O *Cours au choix pour 4 crédits parmi les intitulés suivants :*

⊠ LBIRA2107A	Animal productions : principles and feeding	Michel Focant, Yvan Larondelle	30h+15h	4 Credits	2q	x	
⊠ LBIRA2108	Plant production	Pierre Bertin, Xavier Draye (coord.)	37.5h +15h	4 Credits	1q	x	
⊠ LBIRF2105A	Sylviculture et dendrologie: partie sylviculture	Quentin Ponette	30h+30h	4 Credits	1q	x	

O *Cours au choix pour 2 crédits minimum parmi les intitulés suivants :*

⊠ LENVI2011	Méthodes d'évaluation et de gestion environnementale	Jean-Pierre Tack	30h	3 Credits	2q	x	
⊠ LDROP2062B	Droit de l'urbanisme - 2ème partie	Charles-Hubert Born, Francis Haumont	15h	2 Credits	2q	x	
⊠ LDROP2063	Environmental Law	Nicolas de Sadeleer, Damien Jans	30h	3 Credits	2q	x	

WATER AND EARTH RESOURCES (OPTION 7E) [30.0]

O Mandatory
⊠ Optional
△ Courses not taught during 2014-2015
⊘ Periodic courses not taught during 2014-2015
⊕ Periodic courses taught during 2014-2015
⧺ Two years course

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

						Year 1	Year 2
O LBRES2102	Soil hydrodynamics : modelling	Sébastien Lambot, Marnik Vanclooster (coord.)	30h +22.5h	5 Credits	2q	x	
O LBRES2103	Soil physics	Charles Bielders (coord.), Mathieu Javaux	30h+15h	4 Credits	1q	x	
O LBRES2104	Hydraulics of open irrigation channels	Mathieu Javaux	30h +22.5h	5 Credits	2q	x	
O LBRES2105	Drainage and soil conservation	Charles Bielders	30h +22.5h	5 Credits	2q	x	
O LBRES2106	Integrated management of the soil-plant system	Stephan Declerck, Bruno Delvaux, Xavier Draye (coord.), Nathalie Kruyts (compensates Bruno Delvaux)	45h+15h	6 Credits	2q	x	
O LBRTE2101	Aquatic and soil biological and physical chemistry	Pierre Delmelle, Patrick Gerin (coord.)	37.5h +15h	5 Credits	1q	x	

INFORMATION ANALYSIS AND MANAGEMENT IN BIOLOGICAL ENGINEERING (OPTION 10E - AGI) [30.0]

O Mandatory
⊠ Optional
△ Courses not taught during 2014-2015
⊘ Periodic courses not taught during 2014-2015
⊕ Periodic courses taught during 2014-2015
⧺ Two years course

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

						Year 1	Year 2
O LBRAT2102	Spatial modelling of territorial dynamics	Pierre Defourny	15h+15h	3 Credits	2q	x	
O LSINF1225	Object-oriented design and data management	Kim Mens	30h+30h	5 Credits	2q	x	
O LBRTI2102	Process modelling and forecasting systems	Emmanuel Hanert	30h+15h	5 Credits	1q	x	
O LSTAT2320	Design of experiment.	Patrick Bogaert, Bernadette Govaerts	22.5h +7.5h	5 Credits	2q	x	
O LINGE1216	Management Science: Deterministic models	Philippe Chevalier, Mathieu Van Vyve	30h+15h	5 Credits	2q	x	
O LBRAI2219	Systems Biology	Xavier Draye	30h	3 Credits	1q	x	

O Courses to be chosen in master 1 for min 4 credits preferably among the suggested list:

⊠ LBIRA2101A	Biométrie: analyse de la variance	Xavier Draye, Anouar El Ghouch, Bernadette Govaerts	22h+10h	3 Credits	1q	x	
⊠ LBRAI2101	Population and quantitative genetics	Philippe Baret (coord.), Xavier Draye	45h	4 Credits	1q	x	
⊠ LSINF2224	Programming methods	Charles Pecheur	30h+15h	5 Credits	2q	x	
⊠ LINGI1122	Program conception methods	José Vander Meulen	30h+30h	5 Credits	2q	x	
⊠ LGEO2130	Geographic modelling	Eric Deleersnijder, Sophie Vanwambeke	30h+30h	5 Credits	2q	x	
⊠ LELEC2920	Communication networks	Benoît Macq	30h+30h	5 Credits	1q	x	

						Year 1	2
⊠ LSINF2275	Data mining & decision making	Marco Saerens	30h+30h	5 Credits	2q	x	
⊠ LSTAT2120	Linear models	Christian Hafner	22.5h +7.5h	5 Credits	1q	x	
⊠ LSTAT2350	Data Mining	Libei Chen	15h+15h	5 Credits	2q	x	
⊠ LDEMO2220A	Population models and projections (Part A)	N.	15h+5h	2 Credits	1q	x	
⊠ LDEMO2220B	Population models and projections (Part B)	N.	25h+15h	5 Credits	1q	x	
⊠ LELEC2870	Machine Learning : regression, dimensionality reduction and data visualization	John Lee (compensates Michel Verleysen), Michel Verleysen	30h+30h	5 Credits	1q	x	
⊠ LPHY2153	Introduction à la physique du système climatique et à sa modélisation	Hugues Goosse (compensates Jean-Pascal van Ypersele de Strihou), Hugues Goosse, Jean-Pascal van Ypersele de Strihou	30h+15h	5 Credits	1q	x	
⊠ LPHY2252	Compléments de modélisation du système climatique	Michel Crucifix, Thierry Fichefet, Hugues Goosse, Qiuzhen Yin	45h+7.5h	6 Credits	2q	x	
⊠ LECGE1333	Game theory and the information economy	Pierre Dehez (compensates Julio Davila Muro)	30h+10h	5 Credits	2q	x	
⊠ LSTAT2020	Statistical computing	Céline Bugli	20h+20h	6 Credits	1q	x	

MODULES D'APPROFONDISSEMENT

Les étudiants qui choisissent le module d'approfondissement en Création d'entreprise (m13) doivent s'y inscrire dès la 1ère année de master conjointement à l'option. Le programme de ce module s'articulera avec celui de l'option au cours des deux années de master conformément aux directives du Vice-doyen.

ADVANCED MODULE IN ENVIRONMENTAL TECHNOLOGY : WATER, EARTH, AIR [22.0]

O Mandatory	⊠ Optional
△ Courses not taught during 2014-2015	⊘ Periodic courses not taught during 2014-2015
⊕ Periodic courses taught during 2014-2015	⧺ Two years course

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

						Year 1	2
O LBIRE2214	Projet intégré en technologies environnementales eau-sol-air	Sébastien Lambot, Philippe Sonnet (coord.)	50h	5 Credits	1q		x
O LBRTE2201	Human and environmental toxicology	Alfred Bernard, Cathy Debier (coord.)	45h+7.5h	5 Credits	1q		x

O *Free choice of courses amongst the suggested list:*

⊠ LBRES2102	Soil hydrodynamics : modelling	Sébastien Lambot, Marnik Vanclooster (coord.)	30h +22.5h	5 Credits	2q		x
⊠ LMAPR2690	Valorisation and Treatment of Solid Wastes	N.	22.5h	2 Credits	1q △		x
⊠ LAUCE2191	Hydrogeology and Geoenvironment	Pierre-Yves Bolly, Alain Holeyman	40h+10h	5 Credits	2q		x
⊠ LBIR2000A	Masters internship: part A	N.		5 Credits			x
⊠ LMAPR2647	Sustainable treatment of industrial and domestic waste: Fundamentals	Jacques Devaux, Olivier Françoisse, Patricia Luis Alconero, Olivier Noiset	30h+15h	5 Credits	1q		x
⊠ LMAPR2648	Sustainable treatment of industrial and domestic waste: Case studies	Spyridon Agathos, Damien Debecker, Olivier Françoisse, Patricia Luis Alconero, Olivier Noiset	30h+15h	5 Credits	1q		x

O *Free choice of courses in order to obtain minimum 22 credits*

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⊠ LBIR2000B	Masters internship: part B	N.		5 Credits			x

ADVANCED MODULE IN LAND DEVELOPMENT [22.0]

O Mandatory	⊠ Optional
△ Courses not taught during 2014-2015	⊘ Periodic courses not taught during 2014-2015
⊕ Periodic courses taught during 2014-2015	⧺ Two years course

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

						Year 1	Year 2
O LBIRE2215	Projet intégré et excursion en aménagement du territoire	Pierre Defourny, Anne-Laure Jacquemart (coord.)	80h	8 Credits	1q		x
O LAUCE3011A	Acteurs, territoires et contextes de développement	N.	30h	3 Credits	1q		x

O Courses to be chosen for 3 credits minimum amongst the suggested list:

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⊠ LBRAI2210	Microeconomics of Development	Frédéric Gaspart	30h	3 Credits	1q		x
⊠ LBRAI2212	Economics of Rural Development	Frédéric Gaspart (coord.), Bruno Henry de Frahan	30h	3 Credits	1q		x
⊠ LGEO2150A	Aides à la décision en géographie - Faisabilité des projets	Dominique Peeters, Isabelle Thomas	15h+15h	3 Credits	2q		x
⊠ LECGE1228	Regional Economics	Florian Mayneris	30h+10h	5 Credits	2q		x
⊠ LBIR2000A	Masters internship: part A	N.		5 Credits			x

O Free choice of courses in order to obtain minimum 22 credits

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⊠ LBIR2000B	Masters internship: part B	N.		5 Credits			x

ADVANCED MODULE IN WATER AND EARTH RESOURCES [22.0]

O Mandatory	⊠ Optional
△ Courses not taught during 2014-2015	⊘ Periodic courses not taught during 2014-2015
⊕ Periodic courses taught during 2014-2015	⧺ Two years course

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

						Year 1	Year 2
O LBIRE2217	Projet intégré, séminaires et excursions en ressources en eau et en sol	Charles Bielders, Mathieu Javaux, Marnik Vanclooster (coord.)	90h	9 Credits	1q		x

O Courses to be chosen for 3 credits minimum amongst the suggested list:

⊠ LBRES2203	Soil management and planning in warm regions	Charles Bielders (coord.), Bruno Delvaux, Hugues Titeux (compensates Bruno Delvaux)	22.5h +7.5h	3 Credits	1q		x
⊠ LBRES2204	Integrated water management of water resources	Olivier Cogels, Marnik Vanclooster (coord.)	30h +22.5h	5 Credits	1q		x
⊠ LBRES2206	Material resistance and earth-made constructions	Sébastien Lambot	30h +22.5h	5 Credits	1q		x
⊠ LBIR2000A	Masters internship: part A	N.		5 Credits			x

O Free choice of courses in order to obtain minimum 22 credits

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⊠ LBIR2000B	Masters internship: part B	N.		5 Credits			x

ADVANCED MODULE IN INFORMATION ANALYSIS AND MANAGEMENT IN BIOLOGICAL ENGINEERING [22.0]

O Mandatory
⊠ Optional
△ Courses not taught during 2014-2015
⊘ Periodic courses not taught during 2014-2015
⊕ Periodic courses taught during 2014-2015
⧺ Two years course

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

						Year 1	Year 2
O LBIRE2211	Projet intégré en technologies et gestion de l'information	Patrick Bogaert (coord.), Pierre Defourny, Emmanuel Hanert	60h	6 Credits	1q		x
O LBRTI2202	Special questions in information management	Patrick Bogaert (coord.), Emmanuel Hanert	30h	3 Credits	2q		x
O LBRTI2203	Communication scientifique dans le domaine des sciences exactes	Pascale Gualtieri (coord.), Joël Saucin	30h	3 Credits	1q		x
O *Free choice of courses for 10 credits minimum amongst the suggested list:*							
⊠ LBIR2000A	Masters internship: part A	N.		5 Credits			x
⊠ LBIR2000B	Masters internship: part B	N.		5 Credits			x
⊠ LBIRA2101A	Biométrie: analyse de la variance	Xavier Draye, Anouar El Ghouch, Bernadette Govaerts	22h+10h	3 Credits	1q		x
⊠ LBRAI2101	Population and quantitative genetics	Philippe Baret (coord.), Xavier Draye	45h	4 Credits	1q		x
⊠ LSINF2224	Programming methods	Charles Pecheur	30h+15h	5 Credits	2q		x
⊠ LINGI1122	Program conception methods	José Vander Meulen	30h+30h	5 Credits	2q		x
⊠ LGEO2130	Geographic modelling	Eric Deleersnijder, Sophie Vanwambeke	30h+30h	5 Credits	2q		x
⊠ LELEC2920	Communication networks	Benoît Macq	30h+30h	5 Credits	1q		x
⊠ LELEC2870	Machine Learning : regression, dimensionality reduction and data visualization	John Lee (compensates Michel Verleysen), Michel Verleysen	30h+30h	5 Credits	1q		x
⊠ LSINF2275	Data mining & decision making	Marco Saerens	30h+30h	5 Credits	2q		x
⊠ LSTAT2350	Data Mining	Libei Chen	15h+15h	5 Credits	2q		x
⊠ LDEMO2220A	Population models and projections (Part A)	N.	15h+5h	2 Credits	1q		x
⊠ LDEMO2220B	Population models and projections (Part B)	N.	25h+15h	5 Credits	1q		x
⊠ LPHY2153	Introduction à la physique du système climatique et à sa modélisation	Hugues Goosse (compensates Jean-Pascal van Ypersele de Strihou), Hugues Goosse, Jean-Pascal van Ypersele de Strihou	30h+15h	5 Credits	1q		x
⊠ LPHY2252	Compléments de modélisation du système climatique	Michel Crucifix, Thierry Fichefet, Hugues Goosse, Qiuzhen Yin	45h+7.5h	6 Credits	2q		x
⊠ LECGE1333	Game theory and the information economy	Pierre Dehez (compensates Julio Davila Muro)	30h+10h	5 Credits	2q		x
⊠ LINGE1322	Computer science: Analysis and Design of Information Systems	Jean Vanderdonckt	30h+15h	5 Credits	2q		x
⊠ LSTAT2020	Statistical computing	Céline Bugli	20h+20h	6 Credits	1q		x

ADVANCED MODULE IN ENVIRONMENTAL SCIENCE AND TECHNOLOGY [22.0]

O Mandatory	⊠ Optional
△ Courses not taught during 2014-2015	⊘ Periodic courses not taught during 2014-2015
⊕ Periodic courses taught during 2014-2015	⧺ Two years course

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

O Courses to be chosen for 5 credits minimum amongst the suggested list:

					Year 1	Year 2	
⊠ LBIRE2211	Projet intégré en technologies et gestion de l'information	Patrick Bogaert (coord.), Pierre Defourny, Emmanuel Hanert	60h	6 Credits	1q		x
⊠ LBIRE2214	Projet intégré en technologies environnementales eau-sol-air	Sébastien Lambot, Philippe Sonnet (coord.)	50h	5 Credits	1q		x
⊠ LBIRE2215	Projet intégré et excursion en aménagement du territoire	Pierre Defourny, Anne-Laure Jacquemart (coord.)	80h	8 Credits	1q		x
⊠ LBIRE2217	Projet intégré, séminaires et excursions en ressources en eau et en sol	Charles Bielders, Mathieu Javaux, Marnik Vanclooster (coord.)	90h	9 Credits	1q		x
⊠ LBIR2000A	Masters internship: part A	N.		5 Credits			x

O Free choice of courses in order to obtain minimum 22 credits

⊠ LBIR2000B	Masters internship: part B	N.		5 Credits			x

MODULE IN BUSINESS CREATION [22.0]

O Mandatory	⊠ Optional
△ Courses not taught during 2014-2015	⊘ Periodic courses not taught during 2014-2015
⊕ Periodic courses taught during 2014-2015	⧺ Two years course

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

						Year 1	Year 2
O LCPME2001	Entrepreneurship Theory (in French)	Frank Janssen	30h+20h	5 Credits	1q	x	
O LCPME2002	Managerial, legal and economic aspects of the creation of a company (in French)	Régis Coeurderoy, Yves De Cordt	30h+15h	5 Credits	1q	x	
O LCPME2003	Business plan of the creation of a company (in French)	Frank Janssen	30h+15h	5 Credits	2q	x	x
O LCPME2004	Advanced seminar on Enterpreneurship (in French)	Frank Janssen	30h+15h	5 Credits	2q	x	

O *Free choice of courses in order to obtain minimum 22 credits*

Pour rappel, l'articulation du programme de ce module d'approfondissement avec celui de l'option et la répartition des cours sur les deux années de mster se font en concertation avec le Vice-doyen.

BIRE2M - Information

Admission

General and specific admission requirements for this program must be satisfied at the time of enrolling at the university..

1. Être titulaire d'un diplôme universitaire de premier cycle en sciences de l'ingénieur, orientation bioingénieur (voir plus loin)
2. Apporter la preuve d'une maitrise suffisante de la langue française (niveau B1 du Cadre européen commun de référence)

Si le total de prérequis dépasse 15 crédits, l'accès au master est conditionné à la réussite de l'année préparatoire dont le programme est établi sur base du dossier de l'étudiant.

- 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

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University Bachelors

Diploma	Special Requirements	Access	Remarks
UCL Bachelors			
Bachelor in Bioengineering	Additionnal module in Agronomy [30.0](unknown URL)	Access with additional training	Le cours d'Introduction aux sciences forestières (BIR 1334) doit être ajouté au programme de master.
Bachelier en Sciences de l'ingénieur: orientation bioingénieur	Approfondissement en chimie	Access with additional training	L'étudiant bachelier en sciences de l'ingénieur, orientation bioingénieur ayant suivi au préalable la mineure d'approfondissement en chimie introduit un dossier auprès du vice-doyen, en mentionnant son curriculum détaillé. La commission propose à l'étudiant un programme adapté. Si le volume de cours dépasse les 15 crédits, une année supplémentaire pourra être envisagée.
Bachelier en Sciences de l'ingénieur: orientation bioingénieur	Approfondissement en agronomie	Access with additional training	L'étudiant bachelier en sciences de l'ingénieur, orientation bioingénieur ayant suivi au préalable la mineure d'approfondissement en environnement introduit un dossier auprès du vice-doyen, en mentionnant son curriculum détaillé. La commission propose à l'étudiant maximum 2 cours à rajouter (Introduction aux sciences forestières et/ou économie des ressources naturelles et de l'environnement).
Others Bachelors of the French speaking Community of Belgium			
		On the file: direct access or access with additional training	
Bachelier en Sciences de l'ingénieur, orientation bioingénieur		Access with additional training	L'étudiant bachelier en sciences de l'ingénieur, orientation bioingénieur n'ayant pas suivi au préalable une mineure

			en environnement réputée équivalente introduit un dossier auprès du vice-doyen en mentionnant son curriculum détaillé. Une proposition de cours adaptée est faite à l'étudiant en imposant éventuellement 15 crédits complémentaires de formation.
Bachelors of the Dutch speaking Community of Belgium			
		On the file: direct access or access with additional training	Les conditions d'accès seront définies au cas par cas en fonction des prérequis nécessaires.
Foreign Bachelors			
		On the file: direct access or access with additional training	Les conditions d'accès seront définies au cas par cas en fonction des prérequis nécessaires.

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Non university Bachelors

Diploma	Access	Remarks
> Find out more about links to the university		
> BA en agronomie > BA en chimie (toutes finalités) > BA en chimie finalité biochimie > BA-AESI en sciences: biologie, chimie, physique	Accès au master moyennant réussite d'une année préparatoire de max. 60 crédits	Type court
> BA en sciences agronomiques - type long > BA en sciences industrielles - type long	Après vérification de l'acquisition des matières prérequises, soit accès moyennant la réussite d'une année préparatoire de 60 crédits max, soit accès immédiat moyennant ajout éventuel de 15 crédits max	Type long

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Holders of a 2nd cycle University degree

Diploma	Special Requirements	Access	Remarks
"Licenciés"			
Ingénieur chimiste et des bioindustries		On the file: direct access or access with additional training	
Ingénieur agronome		On the file: direct access or access with additional training	
Bioingénieur		On the file: direct access or access with additional training	
		On the file: direct access or access with additional training	
		On the file: direct access or access with additional training	
		On the file: direct access or access with additional training	

		On the file: direct access or access with additional training	Les masters bioingénieur peuvent également être accessibles sur dossier et notamment par validation des acquis de l'expérience (VAE).
Masters			
		On the file: direct access or access with additional training	
		On the file: direct access or access with additional training	
		On the file: direct access or access with additional training	
		On the file: direct access or access with additional training	
		On the file: direct access or access with additional training	
		Direct access	

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Holders of a non-University 2nd cycle degree

Diploma	Access	Remarks
> Find out more about links to the university		
> MA architecte paysagiste > MA en sciences agronomiques > MA en sciences de l'ingénieur industriel en agronomie > MA en sciences de l'ingénieur industriel, finalités chimie et biochimie > MA en sciences industrielles, finalités chimie et biochimie	Accès direct au master moyennant ajout éventuel de 15 crédits max	Type long

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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.

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Personalized access

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

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Admission and Enrolment Procedures for general registration

Teaching method

The overall structure of the programmes for the Bachelor of Science in Engineering (Bioengineering) and the Master in Bioengineering clearly reflect the

concepts of specialization, gradual choice and individualization of the courses.

1st cycle (Bachelor) :

- same programme for SC and AGRO in first year (BIR11BA),
- special programme in second year (BIR12BA) for all the BIR students
- distinct programme with 30 credits for option courses in third year (BIR**C**13BA, BIR**A**13BA, BIR**E**13BA) : three advanced subsidiary subjects available : chemistry (BIRC), agronomy (BIRA), environment (BIRE).

2nd cycle (Master) :

- choice of three Masters in Bioengineering with a professional focus, together with twelve option courses which partly overlap, optional subjects (either free choice or from the lists) and a final individual dissertation.

  This overall structure gives students the opportunity to have a highly individualized programme whilst at the same time retaining both the **comprehensive nature** of the training and the foundation elements of university education : **independence, competence**, **open-mindedness and interest in research**.

The twelve option courses, which partly overlap at the level of the three Masters in Bioengineering, correspond to fields of activity identified on the basis of a wide-ranging survey of graduates of the Faculty working professionally and of contacts with potential employers.

The interdisciplinarity and the integrated approach are key dimensions in the training of **bioengineers in environmental science and technology**. This is reflected by :

- availability of courses organized by other faculties ;
- grouping of training activities : combined exercises, joint project, analysis of real situations, simulations ;
- the perception, analysis, diagnosis and content of the course specifications (e.g. management, remediation and development) combine different kinds of tools (e.g. field observation, laboratory analysis, databases and information systems) and various scales in space (e.g. from the molecular to the hydrographic basin or from a region to a sub-continent) and in time ;
- teaching teams with a wide range of expertise ;
- learning how best to work in groups of students to develop a real, independent capacity for intellectual work.

Training for research. through research, which is essential for conceptual and innovative awareness and developing intellectual rigour, is reflected by different types of activities :

- producing a final dissertation and taking part in dissertation seminars ;
- participation in subject seminars providing direct contact with young researchers working in the field of environment science and land development;
- presentation of seminars by students from an outside research group or groups and the production of a dissertation.

The application of skills, knowledge and techniques that students have acquired and how they use them together is taken into account in an integrated project in environmental science and technology. This is an important learning activity supplements the dissertation which, in the view of the Faculty, remains the most important part of training for research.

Through the close connection between the teaching and research, the development of new tools and new approaches is the subject of advanced training from the beginning of the 2nd cycle and is therefore central to this Master programme. All this enables graduates of this programme to be able to make rapid use of new techniques and approaches in their early professional experience.

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".

Students are assessed according to the activities in the programme : this can take the form of written and/or oral examinations as well as individual and/or group work.

Further details about how the assessment is done can be found in the course specifications.

Mobility and/or Internationalisation outlook

The programme for the Master in Environmental Bioengineering in offers a wide range of opportunities to study at other institutions, in Belgium, Europe and elsewhere.

The Faculty would like to highlight the strengths of this programme, particularly the potential for research and the fact that it is very much a part of a complete University. The shape of the option courses available has also been influenced by the different fields of activity in which bioengineers work.

There are two kinds of international mobility : students who have already gained their Bachelor degree can move abroad to study for their Master at another institution ; it is also possible to take some course modules in another institution. The mobility rate for AGRO

students on exchange schemes such as Erasmus is around 30-40% and the number of our students who go abroad is similar to the number of foreign students who come to study here.

This mobility should increase given the harmonization of education at the European level and the conclusion of new partnership agreements outside ERASMUS as well as membership of thematic networks. The AGRO Faculty is also a member of the ATHENS network.

Possible trainings at the end of the programme

The Master in Bioengineering programme follows on directly from the Bachelor in Engineering Science (Bioengineering) with an option course in Environment. Successful completion of this programme enables direct entry to other training programmes in the second and third cycles.

- **Advanced Masters** : The Advanced Masters in the filed authorized by regulations in addition to those established by the University Development Commission (Commission Universitaire au Développment â€“ CUD) in the same field.
- **Doctoral programmes** : doctorates in Agronomic Sciences and Biological Engineering.

Contacts

Curriculum Managment

Entite de la structure AGRO

Sigle	**AGRO**	
Dénomination	Faculté des bioingénieurs	
Adresse	Croix du Sud, 2 bte L7.05.01 1348 Louvain-la-Neuve Tél 010 47 37 19 - Fax 010 47 47 45	
Site web	https://www.uclouvain.be/agro	
Secteur	Secteur des sciences et technologies (SST)	
Faculté	Faculté des bioingénieurs (AGRO)	
Mandats	Philippe Baret	Doyen
	Christine Devlesaver	Directeur administratif de faculté
Commissions de programme	Commission de programme - Master Bioingénieur-Sciences agronomiques (BIRA) Commission de programme - Master Bioingénieur-Chimie et bioindustries (BIRC) Commission de programme - Master Bioingénieur-Sciences & technologies de l'environnement (BIRE) Commission de programme - Bachelier en sciences de l'ingénieur, orientation bioingénieur (CBIR) Commission de programme interfacultaire en Sciences et gestion de l'environnement (ENVI)	

Academic Supervisor : Emmanuel Hanert

Jury

Président : **Pierre Bertin**
Secrétaire de jury de la 1ère année de master : **Anne Legrève**
Secrétaire de jury de la 2ième année de master : **Quentin Ponette**

Usefull Contacts

Informations pour les futurs étudiants : Agro Secrétariat de la Faculté (Tel: +32 10 47 37 19)
Information pour les étudiants par le Conseiller aux études : **Patrick Bogaert**