BIRA2M

2014 - 2015

Master [120] in Agricultural 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: **bira2m** - European Qualifications Framework (EQF): 7

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Learning outcomes

Master in Agricultural Sciences Engineering 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 sustainable animal and plant production, respectful of the environment and conscious of food security.

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

• professionals able to tackle and diagnose agronomic problems: production and quality, production systems and industries, protection and development of resources, socio-economic impacts;

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

• innovators able to design new kinds of production and management methods, new processes, etc. in response to many major challenges: feeding the world, bringing together food and health, reconciling agriculture, environment and sustainable development.

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 adopt an integrated approach to 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) which serves as the foundation from which to operate with expertise in the field of agricultural science and technology.

1.1 To build an advanced knowledge base in the field of agricultural science and more specifically in the following disciplines:
• Plant and animal sciences
• The agrarian system
• Agricultural and rural policies
• Biotechnology
1.2 To build highly specialised scientific knowledge in one of the following bioengineering specialisations:
• Science, technology and food quality
• Integrated agronomy
• Integrated plant protection
• Water and land resources
• Information analysis and management in agricultural engineering
• Agricultural development and production in the tropical zones
1.3 To master procedural skills in conducting experiments: molecular biology techniques, experimental design, biometrics and data analysis as well as specific techniques in relation to their choice of specialisation.
1.4 To apply their knowledge critically to tackle a complex agricultural issue ranging from the molecular level to an agro-ecosystem.
1.5 To apply multiple strands of knowledge to resolve a multidisciplinary agricultural problem in order to develop relevant and innovative solutions.

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 agricultural science and technology.

2.1 To build an advanced knowledge base (e.g. concepts, laws, technologies) and tools (e.g. modelling, programming) in engineering sciences:
- Applied biotechnology
- Biometrics
- Animal and plant production
- Management and analysis of production systems and processing
- Agricultural management and decision-making support
- Process engineering
2.2 To build and master highly specialised knowledge and tools in one of the following bioengineering specialisations:
- Technology and food quality
- Integrated agronomy
- Integrated plant protection
- Water and land resources
- Agricultural economics and natural resources

- Information analysis and management in agricultural engineering
- Agricultural development and production in the tropical zones

2.3 To master the operational use of specialised tools in engineering sciences (e.g. systems analysis, statistical analysis, programming, modelling, etc.):
- Planning experiments
- Carrying out surveys
- 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 agricultural problem ranging from the molecular level to an agro-ecosystem.

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.

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 five 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 three 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 agricultural 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 incorporating scientific, economic and sociological aspects. This problem may be related to agricultural production and the quality of products, agricultural production systems and sectors, and to the transformation of agricultural products.

4.1 To strategically differentiate the key elements from the less critical elements relating to a complex agricultural 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 agricultural engineering problem.

4.3 To analyse a complex agricultural 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 agricultural 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 agricultural sciences.

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.

As the graduate must be able to manage a project alone and in a team, the skills listed below are described in the context of the master, through projects not only considered in their scientific and technological dimensions but also the financial and, if applicable, social aspects and with a degree of complexity representative of typical professional scenarios.

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 computerised and technological tools essential for professional communication.

6.9 To learn English to level C1 according to the European references.

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.

The majority of these skills are not developed exclusively through specific activities, but rather as a result of the multiple and diverse situations encountered throughout the course, the educational programmes and the way in which it is run, as well as through the university environment.

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 :

- compulsory professional focus programme for 30 credits.
- compulsory core subjects programme : 5 credits (out of 40) are taken in the first year. All the others (35 credits) from the core subjects programme are taken in the second year.
- choice of one option course of 30 credits from a list of six. The majority of option courses (25 credits) are organized in the first year. Certain courses (5 credits), as already mentioned, are taken in the second year.

  Certain option courses are organized jointly with one or two other programmes from the Master in Bioengineering. This is the reason for the special numbering of these option courses. (For example, option course 1A is also in the programme for the Master in Chemistry and Bioindustry where it is called option course 1C. Option course 10 A is also in the programme for the Master in Bioengineering (Environment Science and Technology) where it is called option course 10E and the Master in Chemistry and Bioindustry where it is called option course 10C.)

Year 2 :

- compulsory core subjects programme : 35 credits (out of 40) are taken in the second year.
- the remainder of the option course (5 credits) chosen in Year 1 of the Master is taken in Year 2.
- choice of a module of 20 credits from nine advanced modules, some of which follow on from the six option courses of Year 1. Students are strongly encouraged to follow the instructions regarding each of these modules.

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 the all courses available at UCL or even 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 â€œBusiness Creationâ€#. This additional programme features in the Master programmes of various faculties (Bioengineering, Law, Business Management, Civil Engineering and Psychology). It is designed to provide students, as potential creators, with the tools for analysis and understanding which will help them 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.

> Core courses *[en-prog-2014-bira2m-lbira200t.html]*

> Professional focus *[en-prog-2014-bira2m-lbira200s]*

Options courses

> Options *[en-prog-2014-bira2m-lbira921r.html]*
- > Science,Technology and Food Quality (Option 1A) *[en-prog-2014-bira2m-lbira201o.html]*
- > Water and Earth Resources (Option 7A) *[en-prog-2014-bira2m-lbira207o.html]*
- > Integrated Agronomy (Option 8A) *[en-prog-2014-bira2m-lbira208o.html]*
- > Integrated Plant Protection (Option 9A) *[en-prog-2014-bira2m-lbira209o.html]*
- > Information Analysis and Management in Biological Engineering (Option 10A) *[en-prog-2014-bira2m-lbira210o.html]*
- > Agricultural Economics and Natural Resources (Option 11A) *[en-prog-2014-bira2m-lbira211o.html]*
- > AFEPA (Option 14A) *[en-prog-2014-bira2m-lbira212o.html]*

> Modules d'approfondissement *[en-prog-2014-bira2m-lbira922r.html]*
- > Advanced module in Science, Technology and Food Quality-m1 *[en-prog-2014-bira2m-lbira221o.html]*
- > Advanced module in Plant Protection-m2 *[en-prog-2014-bira2m-lbira222o.html]*
- > Advanced module in Plant Production-m3 *[en-prog-2014-bira2m-lbira223o.html]*
- > Advanced Module in Animal Production-m4 *[en-prog-2014-bira2m-lbira224o.html]*
- > Advanced Module in Agricultural Development and Production in Tropical Zones-m5 *[en-prog-2014-bira2m-lbira225o.html]*
- > Advanced Module in Plant Improvement and Protection-m6 *[en-prog-2014-bira2m-lbira226o.html]*
- > Advanced Module in Water and Earth Resources-m7 *[en-prog-2014-bira2m-lbira227o.html]*
- > Advanced module in Information Analysis and Management in Biological Engineering-m8 *[en-prog-2014-bira2m-lbira230o.html]*
- > Advanced module in Agricultural Economics and Natural Resources-m9 *[en-prog-2014-bira2m-lbira231o.html]*
- > Module in Setting up small and medium-sized businesses-m13 *[en-prog-2014-bira2m-lbira232o.html]*
- > Advanced module AFEPA-m14 *[en-prog-2014-bira2m-lbira233o.html]*

BIRA2M Detailled programme

Programme by subject

CORE COURSES [40.0]

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.

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...)

⊠ *Core courses if option 1A, 7A,8A,10A or 11A is chosen*

Les étudiants qui choisissent le module Création d'entreprises (m13) réalisent leur mémoire dans le cadre de la formation interdisciplinaire CPME. L'accès à cette option est limité: http://www.uclouvain.be/cpme.html ou infos: cpme@uclouvain.be La sélection a lieu la semaine qui précède la rentrée académique de la première année de master.

						Year 1	Year 2
O LBIRA2109	Agrarian systems and farm	Mohamed Walid Ben Youssef Sadok, Pierre Bertin (coord.)	45h+7.5h	5 Credits	1q	x	
O LBIRA2200	Master thesis	N.		27 Credits			x
O LBIRA2201	Interdisciplinary project in agronomy	Mohamed Walid Ben Youssef Sadok, Cathy Debier (coord.), François Heroufosse, Yvan Larondelle	30h	3 Credits	1q		x
O LBIRA2210	Master thesis' accompanying seminar	Philippe Baret, Pierre Bertin (coord.), Cathy Debier, Frédéric Gaspart, Anne Legrève	30h	3 Credits	1 + 2q		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

⊠ *Core courses for option AFEPA 14A and advanced option M14 offered at UCL*

O LBIRA2200	Master thesis	N.		27 Credits			x
O LBIRA2210	Master thesis' accompanying seminar	Philippe Baret, Pierre Bertin (coord.), Cathy Debier, Frédéric Gaspart, Anne Legrève	30h	3 Credits	1 + 2q		x
O LBRAI2218	Special Topics in Agricultural Economics	Bruno Henry de Frahan	30h +22.5h	5 Credits	1q		x

O Cours au choix libre en 1ère année de master pour 5 crédits.

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...)

⊠ Programme for options 1A,7A,8A,9A, 10A & 11A

						Year 1	Year 2
O LBIRA2101	Biometry : analysis of the variance	Xavier Draye (coord.), Anouar El Ghouch, Bernadette Govaerts	30h+15h	4 Credits	1q	x	
O LBIRA2102	Applied biotechnology	Isabelle Donnay, Xavier Draye, Jacques Mahillon (coord.)	30h+7.5h	4 Credits	1q	x	
O LBIRA2104	Decision Tools and Farm Management	Jean-Marie Bouquiaux, Frédéric Gaspart (coord.)	45h+7.5h	5 Credits	2q	x	
O LBIRA2105	Agricultural and rural policies	Bruno Henry de Frahan	30h	3 Credits	1q	x	
O LBIRA2106	Principles of phytiatry	Claude Bragard (coord.), Anne Legrève	30h	3 Credits	1q	x	
O LBIRA2107	Animal production	Michel Focant, Yvan Larondelle (coord.)	30h+15h	4 Credits	2q	x	
O LBIRA2108	Plant production	Pierre Bertin, Xavier Draye (coord.)	37.5h +15h	4 Credits	1q	x	
O LBIRC2109A	Génie des procédés : Opérations unitaires	Damien Debecker	30h+7.5h	3 Credits	2q	x	

⊠ Programme for the option AFEPA - option 14A and advanced module M14 - offered at UCL

O LECON2411	Norms and Public Interventionng	François Maniquet, Eve Ramaekers (compensates François Maniquet)	30h	5 Credits	2q	x	
O LECON2607	Public Economics	Jean Hindriks	30h	5 Credits	2q	x	
O LGEO2150	Decision making in geography	Dominique Peeters, Isabelle Thomas	30h+30h	5 Credits	2q	x	
O LBRAI2213	Evaluation of Agricultural Policies	Bruno Henry de Frahan	30h	3 Credits	2q	x	
O LBIRA2104B	Decision Tools	Frédéric Gaspart	20h	2 Credits	2q	x	
O LBRAI2208	Firms and Markets : Strategic Analysis	Frédéric Gaspart	30h+15h	5 Credits	1q	x	

O One course to be chosen amongst the suggested list:

⊠ LECGE1316	Econometrics	Muriel Dejemeppe	30h+15h	5 Credits	1q	x	
⊠ LINGE1221	Econometrics	Christian Hafner	30h+15h	5 Credits	2q	x	
⊠ LECON2033	Applied econometrics: Microeconometrics	Muriel Dejemeppe	30h+12h	5 Credits	1q	x	

OPTIONS

Les étudiants ont le choix entre 7 options en première année de master et 11 modules d'approfondissement en deuxième année de master. La plupart des combinaisons sont possibles. Cependant, les étudiants sont invités à réfléchir dès la première année à l'articulation des options et des modules, certains modules suivant de manière préférentielle certaines options.

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 qui a lieu au moment de la rentrée académique. Une fois sélectionnés, les étudiants prendront 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.

La participation au programme Erasmus Mundus interuniversitaire AFEPA (Agricultural, Food and Environmental Policy Analysis) fait également l'objet d'une sélection dont les modalités sont décrites à la page suivante: www.uclouvain.be/afepa

Options

> Science,Technology and Food Quality (Option 1A) *[en-prog-2014-bira2m-lbira201o]*
> Water and Earth Resources (Option 7A) *[en-prog-2014-bira2m-lbira207o]*
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> Advanced Module in Animal Production-m4 *[en-prog-2014-bira2m-lbira224o]*
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> Advanced module AFEPA-m14 *[en-prog-2014-bira2m-lbira233o]*

OPTIONS

SCIENCE,TECHNOLOGY AND FOOD QUALITY (OPTION 1A) [25.0]

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 LBRAL2102	Physiological and nutritional biochemistry	Yvan Larondelle (coord.), Yves-Jacques Schneider	52.5h	5 Credits	1q	x	
O LBRAL2103	Food chemistry	Sonia Collin	30h +22.5h	5 Credits	1q	x	
O LBRAL2104	Food microbiology	Jacques Mahillon	30h +22.5h	5 Credits	2q	x	
O LBRAL2201	Food technology	Axel Kather	60h+15h	7 Credits	2q	x	
O LBIR1318A	Analyse organique I : techniques de séparation	Sonia Collin, Vesna Jerkovic	30h	3 Credits	2q	x	

WATER AND EARTH RESOURCES (OPTION 7A) [25.0]

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 LBRES2103	Soil physics	Charles Bielders (coord.), Mathieu Javaux	30h+15h	4 Credits	1q	x	
O LBRES2102	Soil hydrodynamics : modelling	Sébastien Lambot, Marnik Vanclooster (coord.)	30h +22.5h	5 Credits	2q	x	

O Courses to be chosen for 5 credits among the following courses:

⊠ LBIRE2103	General hydrology	Charles Bielders, Marnik Vanclooster (coord.)	30h +22.5h	5 Credits	1q	x	
⊠ LBIRE2104	Applied soil sciences	Jean-Thomas Cornélis (compensates Bruno Delvaux), Bruno Delvaux	30h +22.5h	5 Credits	2q	x	

O Courses to be chosen for minimum 11 credits among the following courses:

⊠ LBRES2104	Hydraulics of open irrigation channels	Mathieu Javaux	30h +22.5h	5 Credits	2q	x	
⊠ LBRES2105	Drainage and soil conservation	Charles Bielders	30h +22.5h	5 Credits	2q	x	
⊠ 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	
⊠ LBRTE2101	Aquatic and soil biological and physical chemistry	Pierre Delmelle, Patrick Gerin (coord.)	37.5h +15h	5 Credits	1q	x	

INTEGRATED AGRONOMY (OPTION 8A) [25.0]

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 LBRAI2101	Population and quantitative genetics	Philippe Baret (coord.), Xavier Draye	45h	4 Credits	1q	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 LBRAI2107	Zootechnie	Jean-Paul Dehoux (coord.), Isabelle Donnay, Michel Focant	30h	3 Credits	2q	x	
O LBRAI2106	Phytotechnie	Pierre Bertin (coord.), Charles Bielders, Xavier Draye	50h+10h	6 Credits	2q	x	

O One course to be chosen amongst:

⊠ LSTAT2320A	Plans expérimentaux: cours et exercices	Patrick Bogaert, Bernadette Govaerts	22.5h +5.5h	3 Credits	2q	x	
⊠ LBIRE2102B	APPLIED GEOMATICS	Pierre Defourny	22.5h +7.5h	3 Credits	1q	x	

O Cours à choisir pour 3 crédits minimum parmi les intitulés suivants:

⊠ LBRAL2102B	Biochimie physiologique et nutritionnelle: parties 2,3,4 et5	Yvan Larondelle, Yves-Jacques Schneider	32h	3 Credits	1q	x	
⊠ LBIR1318A	Analyse organique I : techniques de séparation	Sonia Collin, Vesna Jerkovic	30h	3 Credits	2q	x	
⊠ LBIRF2203	Pisciculture	Xavier Rollin	30h	3 Credits	1q	x	
⊠ LECGE1213	Marketing	Nicolas Kervyn de Meerendré	30h+15h	4 Credits	1q	x	
⊠ LECGE1321	Human Management	Nathalie Delobbe	30h+15h	4 Credits	2q	x	
⊠ LBRAI2208A	Firms and Markets: strategic analysis - partim A	Frédéric Gaspart	30h	3 Credits	1q	x	

INTEGRATED PLANT PROTECTION (OPTION 9A) [25.0]

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 LBRAI2106	Phytotechnie	Pierre Bertin (coord.), Charles Bielders, Xavier Draye	50h+10h	6 Credits	2q	x	
O LBRPP2101	Biology of phytopathogenic bacteria, fungi, nematodes and viruses	Claude Bragard, Stephan Declerck, Anne Legrève (coord.)	37.5h +15h	5 Credits	2q	x	
O LBRPP2102	Entomology applied to agriculture	Jean-Claude Grégoire, Thierry Hance (coord.), Hans Van Dyck	37.5h +15h	5 Credits	1q	x	
O LBRPP2103	Phytopathology	Claude Bragard, Anne Legrève (coord.)	30h +22.5h	5 Credits	1q	x	

O *Course to choose in Master year 1 for a minimum of 4 ECTS:*

INFORMATION ANALYSIS AND MANAGEMENT IN BIOLOGICAL ENGINEERING (OPTION 10A) [25.0]

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 LBRTI2102	Process modelling and forecasting systems	Emmanuel Hanert	30h+15h	5 Credits	1q	x	
O LSINF1225	Object-oriented design and data management	Kim Mens	30h+30h	5 Credits	2q	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 LBRMC2201	Bioinformatics : DNA and protein sequences	Michel Ghislain (coord.), Jacques Mahillon	30h+15h	5 Credits	1q	x	

AGRICULTURAL ECONOMICS AND NATURAL RESOURCES (OPTION 11A) [25.0]

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 LGEO2150	Decision making in geography	Dominique Peeters, Isabelle Thomas	30h+30h	5 Credits	2q	x	
O LBRAI2213	Evaluation of Agricultural Policies	Bruno Henry de Frahan	30h	3 Credits	2q	x	

					Year 1	Year 2
LBRAI2208A	Firms and Markets: strategic analysis - partim A	Frédéric Gaspart	30h	3 Credits	1q	x	

One course to be chosen among the 2 following courses:

LECGE1316	Econometrics	Muriel Dejemeppe	30h+15h	5 Credits	1q	x	
LINGE1221	Econometrics	Christian Hafner	30h+15h	5 Credits	2q	x	

One course to be chosen among the 2 following courses:

LECON2370	Industrial Organization and Competition Policy	Mathieu Parenti	30h	5 Credits	1q	x	
LECON2411	Norms and Public Interventionng	François Maniquet, Eve Ramaekers (compensates François Maniquet)	30h	5 Credits	2q	x	

One course to be chosen among the 4 following courses

LGEO1321	Human and Economic geography 1	Sophie Vanwambeke	25h+25h	4 Credits	2q	x	
LECON2370	Industrial Organization and Competition Policy	Mathieu Parenti	30h	5 Credits	1q	x	

AFEPA (OPTION 14A) [25.0]

Rappel:la participation au programme **Erasmus Mundus interuniversitaire AFEPA** (**Agricultural, Food and Environmental Policy Analysis**) fait l'objet d'une sélection.

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...)

Courses to be chosen for 25 credits among 3 of the 6 subjects of which 2 are offered only in the other AFEPA partners institutions:

⊠ Agricultural and Trade Policy

Offerred also at CUB, SLU and UBonn

					Year 1	Year 2
⊠ LBIRA2105	Agricultural and rural policies	Bruno Henry de Frahan	30h	3 Credits	1q	x
⊠ LECON2041	International Trade	Fabio Mariani, Aminata Sissoko (compensates Fabio Mariani)	30h	5 Credits	2q	x
⊠ LBIRA2104A	Farm Management	Frédéric Gaspart	25h+7.5h	3 Credits	2q	x
⊠ LECON2033	Applied econometrics: Microeconometrics	Muriel Dejemeppe	30h+12h	5 Credits	1q	x
⊠ LECON2370	Industrial Organization and Competition Policy	Mathieu Parenti	30h	5 Credits	1q	x
⊠ LGEO2210	Advanced human geography	Dominique Peeters	30h	3 Credits		x

⊠ Agricultural and Food Sciences

Offered also at UBonn and UPC

⊠ LBIRA2109	Agrarian systems and farm	Mohamed Walid Ben Youssef Sadok, Pierre Bertin (coord.)	45h+7.5h	5 Credits	1q	x
⊠ LBIRA2102	Applied biotechnology	Isabelle Donnay, Xavier Draye, Jacques Mahillon (coord.)	30h+7.5h	4 Credits	1q	x
⊠ 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

⊠ Agricultural and Environmental Sciences

Offered also at UBonn

⊠ LBIRE2103	General hydrology	Charles Bielders, Marnik Vanclooster (coord.)	30h +22.5h	5 Credits	1q	x
⊠ 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
⊠ LBIRE2102B	APPLIED GEOMATICS	Pierre Defourny	22.5h +7.5h	3 Credits	1q	x

⊠ Rural Development Policy

Offered also at UBonn

⊠ LBRAI2210	Microeconomics of Development	Frédéric Gaspart	30h	3 Credits	1q	x

						Year 1	2
⊠ LBRAI2212	Economics of Rural Development	Frédéric Gaspart (coord.), Bruno Henry de Frahan	30h	3 Credits	1q	x	
⊠ LBRAI2213	Evaluation of Agricultural Policies	Bruno Henry de Frahan	30h	3 Credits	2q	x	
⊠ LECON2033	Applied econometrics: Microeconometrics	Muriel Dejemeppe	30h+12h	5 Credits	1q	x	
⊠ LECON2312	Macroeconomics of the development	Frédéric Docquier	30h	5 Credits	2q	x	
⊠ LECON2314	Economic Geography	Florian Mayneris	30h	5 Credits	2q	x	
⊠ LECON2370	Industrial Organization and Competition Policy	Mathieu Parenti	30h	5 Credits	1q	x	

⊠ *Environmental & Natural Resource Policy*

Offered only at CUB, SLU, UBonn and UPC

⊠ *Agribusiness Management & Market Analysis*

Offered only at CUB, SLU, UBonn and UPC

MODULES D'APPROFONDISSEMENT

The students who choose the module "Lauching of small and medium-sized companies (SMC)" must enrol in year 1 of their master programme along with the option. The programme of this module is linked with the option over the 2 years of the master programme with the approval of the Vice-Dean.

ADVANCED MODULE IN SCIENCE, TECHNOLOGY AND FOOD QUALITY-M1 [25.0]

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...)

To take this module, students should have chosen in Year 1 the Option 1A in Science, Technologies & Food Quality. Students wishing to do an interships will enrol at both partims of the activity amongst the 'cours au choix'.

						Year 1	Year 2
O LBRAL2202	Technological and statistical quality control	Vincent Baeten	30h	2 Credits	1q		x
O LSTAT2310A	Controle stat. de Qualité : Partim A	Bernadette Govaerts	12h+4h	2 Credits	1q		x
O LBRAL2203	Biochemistry of bacterial fermentations	Michel Ghislain	15h+15h	3 Credits	1q		x
O LBRTE2201	Human and environmental toxicology	Alfred Bernard, Cathy Debier (coord.)	45h+7.5h	5 Credits	1q		x
O *Activities to be chosen in Year 2 for minimum 8 credits among the following courses:*							
⊠ LBRAL2101	Beer organoleptic and microbiological quality	Sonia Collin (coord.), Marc Maudoux	30h +22.5h	5 Credits	2q		x
⊠ LBRAL2105	Brewing biochemistry	Pablo Alvarez Costales, Stephan Declerck (coord.), Laurent Mélotte	30h +22.5h	5 Credits	1q		x
⊠ LBRAL2106	Brewing biochemistry	Sonia Collin	30h +22.5h	5 Credits	1q		x
⊠ LBRAI2206	Technology and processing of animal products	Michel Focant (coord.), Pierre Stassart	30h+15h	4 Credits	1q		x
⊠ LBIRE2105	Water and soil quality	Henri Halen, Xavier Rollin (coord.)	30h+7.5h	3 Credits	2q		x
⊠ LBRMC2202	Cell culture technology	Marc Boutry (coord.), Pascal Hols, Yves-Jacques Schneider	30h	3 Credits	1q		x
⊠ LBIRF2203	Pisciculture	Xavier Rollin	30h	3 Credits	1q		x
⊠ LBBMC2110	Génétique moléculaire et génomique animales et humaines	Françoise Gofflot, Bernard Knoops, René Rezsohazy	36h+18h	5 Credits	2q		x
⊠ LBBMC2104	Biochimie physiologique animale	Cathy Debier, Marc Francaux, Pierre Morsomme (compensates Marc Francaux), Yves-Jacques Schneider (coord.)	36h+18h	5 Credits	2q		x
⊠ LSTAT2320	Design of experiment.	Patrick Bogaert, Bernadette Govaerts	22.5h +7.5h	5 Credits	2q		x
⊠ LBBMC2204A	Pharmacologie cellulaire et moléculaire - concepts de base	Yves-Jacques Schneider	30h	3 Credits	1q		x
⊠ LBBMC2107	Physiologie cellulaire microbienne	Stephan Declerck, Michel Ghislain, Bernard Hallet, Pascal Hols, Pierre Morsomme	36h+18h	5 Credits	2q		x
⊠ LBIO1335	Immunology	Jean-Paul Dehoux	25h+15h	3 Credits	1q		x
⊠ LBIRE2102B	APPLIED GEOMATICS	Pierre Defourny	22.5h +7.5h	3 Credits	1q		x
⊠ LVET1374A	Physiologie digestive	Cathy Debier, Yvan Larondelle	30h	3 Credits	2q		x

						Year 1	2
⊠ LBIRC2101A	Analyse biochimique et notions de génie génétique: analyse biochimique	Marc Boutry, François Chaumont, Pierre Morsomme	18.5h +22.5h	4 Credits	1q		x
⊠ LBIRC2101B	Analyse biochimique et notions de génie génétique: Notions de génie génétique	Marc Boutry, François Chaumont, Pierre Morsomme	18.5h +22.5h	4 Credits	1q		x
⊠ LBIR2000A	Masters internship: part A	N.		5 Credits			x

Activites to be chosen in Year 2 in order to obtain min 25 credits of this module

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

ADVANCED MODULE IN PLANT PROTECTION-M2 [25.0]

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...)

This module is available for students who have taken in Year 1, the following options: 8A ou 9A or 11A. Students wishing to do an intership will enrol at both partims of the stage, lBIR2000A and LBIR2000B

						Year 1	Year 2
O LBOE2160	Ecologie des interactions	Thierry Hance, Anne-Laure Jacquemart	24h	2 Credits	1q		x
O LBRPP2206	Integrated crop protection	Claude Bragard (coord.), Thierry Hance, Anne Legrève	45h	5 Credits	1q		x
O LBRPP2207	Epidemiology and warning systems in plant pathology	Anne Legrève	30h	3 Credits	2q		x
O LBRPP2205	Plant chemistry : diagnostics and recommendations	Claude Bragard, Anne Legrève (coord.)	60h	5 Credits	1 + 2q		x

O One course to be chosen in Year 2 for minimum 3 credits among the following courses:

Les étudiants ayant suivi l'option 8A en Agronomie intégrée ou 11A en Economie agricole et des ressources naturelles prendront de préférence le cours LBRPP2103A.

⊠ LBOE2168	Interactions plantes-environnement	Stanley Lutts	24h+12h	3 Credits	1q		x
⊠ LBRES2106A	Integrated management of the soil-plant system (partim)	Stephan Declerck, Xavier Draye (coord.)	29h+7h	4 Credits	2q		x
⊠ LBRPP2103A	Phytopathology (partim)	Claude Bragard, Anne Legrève	30h	3 Credits	1q		x

O Activités au choix pour 3 crédits minimum parmi les intitulés suivants:

⊠ LBIR2000A	Masters internship: part A	N.		5 Credits			x
⊠ LBRPP2204	Special questions in plant protection	Claude Bragard (coord.), Anne Legrève	30h	3 Credits	1 + 2q		x

O Activités au choix pour 3 crédits minimum parmi les intitulés suivants:

⊠ LBIR2000B	Masters internship: part B	N.		5 Credits			x
⊠ LBBMC2108A	Génétique moléculaire et génomique végétale	Henri Batoko, François Chaumont, Xavier Draye		3 Credits			x

ADVANCED MODULE IN PLANT PRODUCTION-M3 [25.0]

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...)

This module is available for students who have taken in Year 1, the following options: 8A ou 9A or 11a. Students whishing to do an internships will enrol at both partims of the stage LBIR2000A et LBIR2000B.

						Year 1	Year 2
O LBRAI2103	Rural sociology and land use	Pierre Bertin	30h	3 Credits	1q		x
O LBRAI2201	Integrated exercises in agronomy	Mohamed Walid Ben Youssef Sadok, Richard Lambert (coord.)	30h	3 Credits	1q		x
O LBRAI2203	Genetic diversity and plant amelioration	Pierre Bertin	30h+7.5h	3 Credits	1q		x
O LBRAI2216	Horticultural production	Pierre Bertin	30h+15h	4 Credits	1q		x
O LBRAI2217	Meadows and trails	Mohamed Walid Ben Youssef Sadok, Richard Lambert (coord.)	45h	4 Credits	2q		x

O Activités au choix pour 3 crédits minimum parmi les intitulés suivants:

⊠ LBIR2000A	Masters internship: part A	N.		5 Credits			x
⊠ LBOE2168	Interactions plantes-environnement	Stanley Lutts	24h+12h	3 Credits	1q		x
⊠ LBRPP2102	Entomology applied to agriculture	Jean-Claude Grégoire, Thierry Hance (coord.), Hans Van Dyck	37.5h +15h	5 Credits	1q		x
⊠ LBRPP2103A	Phytopathology (partim)	Claude Bragard, Anne Legrève	30h	3 Credits	1q		x
⊠ LBRPP2205	Plant chemistry : diagnostics and recommendations	Claude Bragard, Anne Legrève (coord.)	60h	5 Credits	1 + 2q		x
⊠ LBRPP2206	Integrated crop protection	Claude Bragard (coord.), Thierry Hance, Anne Legrève	45h	5 Credits	1q		x

O Courses to be taken in order to reach minimum 25 credits of the module

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

ADVANCED MODULE IN ANIMAL PRODUCTION-M4 [25.0]

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...)

This module is available for students who have taken in Year 1, the following options: 8A ou 9A or 11A. Students wishing to do an intership will enrol at both partims of the stage LBIR2000A et LBIR2000B.

						Year 1	Year 2
O LBRAI2104	Tropical zootechnology	Jean-Paul Dehoux	30h	3 Credits	1q		x
O LBRAI2201	Integrated exercises in agronomy	Mohamed Walid Ben Youssef Sadok, Richard Lambert (coord.)	30h	3 Credits	1q		x
O LBRAI2206	Technology and processing of animal products	Michel Focant (coord.), Pierre Stassart	30h+15h	4 Credits	1q		x
O LBRAI2217	Meadows and trails	Mohamed Walid Ben Youssef Sadok, Richard Lambert (coord.)	45h	4 Credits	2q		x
O LBIRA2207	Diversité génétique et amélioration génétique	Philippe Baret	30h	3 Credits	1q		x

O Courses to be chosen in Year 2 for minimum 3 credits among the following courses:

⊠ LBRAL2102B	Biochimie physiologique et nutritionnelle: parties 2,3,4 et5	Yvan Larondelle, Yves-Jacques Schneider	32h	3 Credits	1q		x
⊠ LBRTE2201	Human and environmental toxicology	Alfred Bernard, Cathy Debier (coord.)	45h+7.5h	5 Credits	1q		x
⊠ LBIRF2203	Pisciculture	Xavier Rollin	30h	3 Credits	1q		x
⊠ LBIR2000A	Masters internship: part A	N.		5 Credits		x	x

O Courses to be taken in order to reach minimum 25 credits of the module

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

ADVANCED MODULE IN AGRICULTURAL DEVELOPMENT AND PRODUCTION IN TROPICAL ZONES-M5 [25.0]

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...)

This module is available for students who have taken in Year 1, the following options: 8A ou 9A or 11A. Students whishing to do an internships will enrol at both partims of the stage LBIR2000A and LBIR2000B.

						Year 1	Year 2
O LBRAI2103	Rural sociology and land use	Pierre Bertin	30h	3 Credits	1q		x
O LBRAI2104	Tropical zootechnology	Jean-Paul Dehoux	30h	3 Credits	1q		x
O LBRAI2212	Economics of Rural Development	Frédéric Gaspart (coord.), Bruno Henry de Frahan	30h	3 Credits	1q		x
O LBRAI2214	Enquête et pratiques d'intervention en milieu rural tropical	Philippe Baret, Claude Bragard (coord.), Pierre Defourny	15h+15h	3 Credits	1q		x
O 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
O LFNDP2202	Economie du développement	N.		3 Credits			x

O *Activités au choix libre: volume modulable pour obtenir un total minimum de 25 crédits pour l'approfondissement, dont:*

⊠ LBIR2000A	Masters internship: part A	N.		5 Credits			x
⊠ LBIR2000B	Masters internship: part B	N.		5 Credits			x

ADVANCED MODULE IN PLANT IMPROVEMENT AND PROTECTION-M6 [25.0]

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...)

This module is available for students who have taken in Year 1, the following options: 8A ou 9A or 11A. Students wishing to do an internships will enrol at both partims of the stage LBIR2000A and LBIR2000B.

						Year 1	Year 2
O LBBMC2108A	Génétique moléculaire et génomique végétale	Henri Batoko, François Chaumont, Xavier Draye		3 Credits			x
O LBRAI2203	Genetic diversity and plant amelioration	Pierre Bertin	30h+7.5h	3 Credits	1q		x
O LBRPP2205	Plant chemistry : diagnostics and recommendations	Claude Bragard, Anne Legrève (coord.)	60h	5 Credits	1 + 2q		x

O Courses to be chosen in Year 2 for minimum 7 credits among the following courses:

⊠ LBRAI2101	Population and quantitative genetics	Philippe Baret (coord.), Xavier Draye	45h	4 Credits	1q		x
⊠ LBRAI2216	Horticultural production	Pierre Bertin	30h+15h	4 Credits	1q		x
⊠ LBRPP2103A	Phytopathology (partim)	Claude Bragard, Anne Legrève	30h	3 Credits	1q		x
⊠ LBRPP2206	Integrated crop protection	Claude Bragard (coord.), Thierry Hance, Anne Legrève	45h	5 Credits	1q		x

O Activités au choix pour 3 crédits minimum parmi les intitulés suivants:

⊠ LBIR2000A	Masters internship: part A	N.		5 Credits			x
⊠ LBRPP2204	Special questions in plant protection	Claude Bragard (coord.), Anne Legrève	30h	3 Credits	1 + 2q		x

O Cours au choix pour 3 crédits minimum parmi les intitulés suivants:

⊠ LBRPP2207	Epidemiology and warning systems in plant pathology	Anne Legrève	30h	3 Credits	2q		x
⊠ LBIR2000B	Masters internship: part B	N.		5 Credits			x

ADVANCED MODULE IN WATER AND EARTH RESOURCES-M7 [25.0]

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...)

To take this module, it is recommanded to have followed the option 7A - Water and Earth Resources. Moreover, students taking this module will only follow part of the course LBIRE2217: seminars and field trips.

						Year 1	Year 2
O LBIRE2217A	Projet intégré (partim) : séminaires et excursions en ressources en eau et en sol	Charles Bielders, Marnik Vanclooster	40h	4 Credits	1q		x

O Courses to be chosen in Year 2 for minimum 8 credits among the following courses:

⊠ 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
⊠ LBIRE2102B	APPLIED GEOMATICS	Pierre Defourny	22.5h +7.5h	3 Credits	1q		x
⊠ LBIR2000A	Masters internship: part A	N.		5 Credits			x

O Courses to be chosen in Year 2 for minimum 5 credits among the following courses:

⊠ LBRES2104	Hydraulics of open irrigation channels	Mathieu Javaux	30h +22.5h	5 Credits	2q		x
⊠ LBRES2105	Drainage and soil conservation	Charles Bielders	30h +22.5h	5 Credits	2q		x
⊠ 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
⊠ LBRTE2101	Aquatic and soil biological and physical chemistry	Pierre Delmelle, Patrick Gerin (coord.)	37.5h +15h	5 Credits	1q		x

O Courses to be chosen in Year 2 in order to reach minimum 25 credits in the module

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

ADVANCED MODULE IN INFORMATION ANALYSIS AND MANAGEMENT IN BIOLOGICAL ENGINEERING-M8 [25.0]

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...)

To take this module, it is recommanded to have followed the option 10A - Analysis and Management in Biological Engineering. Students wishing to do an internship will have to enrol at both partims of the stage LBIR2000A and LBIR2000B.

						Year 1	Year 2
O LBRAI2101	Population and quantitative genetics	Philippe Baret (coord.), Xavier Draye	45h	4 Credits	1q		x
O LBRAI2219	Systems Biology	Xavier Draye	30h	3 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 LBIRE2102	Applied Geomatic	Pierre Defourny	30h +22.5h	4 Credits	1q		x
O *Courses to be chosen for minimum 8 ECTS preferably among the suggested list:*							
⊠ LBRAT2102	Spatial modelling of territorial dynamics	Pierre Defourny	15h+15h	3 Credits	2q		x
⊠ LSTAT2320	Design of experiment.	Patrick Bogaert, Bernadette Govaerts	22.5h +7.5h	5 Credits	2q		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
⊠ 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
⊠ 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
⊠ LELEC2870	Machine Learning : regression, dimensionality reduction and data visualization	John Lee (compensates Michel Verleysen), Michel Verleysen	30h+30h	5 Credits	1q		x
⊠ LBIR2000A	Masters internship: part A	N.		5 Credits			x
⊠ LBIR2000B	Masters internship: part B	N.		5 Credits			x

ADVANCED MODULE IN AGRICULTURAL ECONOMICS AND NATURAL RESOURCES-M9 [25.0]

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...)

This module is available for students having taken one of the 3 options: 8A, 9A or 11A. Students whishing to do an internship will enrol at both partims of the stage LBIR2000A and LBIR2000B.

						Year 1	Year 2
O LBRAI2218	Special Topics in Agricultural Economics	Bruno Henry de Frahan	30h +22.5h	5 Credits	1q		x

O One course to be chosen among the following courses:

⊠ LBRAI2212	Economics of Rural Development	Frédéric Gaspart (coord.), Bruno Henry de Frahan	30h	3 Credits	1q		x
⊠ LBRAI2208A	Firms and Markets: strategic analysis - partim A	Frédéric Gaspart	30h	3 Credits	1q		x

O Courses to be chosen for minimum 12 credits among the following courses:

⊠ 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
⊠ LBRAI2213	Evaluation of Agricultural Policies	Bruno Henry de Frahan	30h	3 Credits	2q		x
⊠ LBRAT2103	Rural sociology and land development	Daniel Bodson	30h	3 Credits	1q		x
⊠ LBIRE2102B	APPLIED GEOMATICS	Pierre Defourny	22.5h +7.5h	3 Credits	1q		x
⊠ LECON2041	International Trade	Fabio Mariani, Aminata Sissoko (compensates Fabio Mariani)	30h	5 Credits	2q		x
⊠ LECON2314	Economic Geography	Florian Mayneris	30h	5 Credits	2q		x
⊠ LBIR2000A	Masters internship: part A	N.		5 Credits			x
⊠ LBRAI2208A	Firms and Markets: strategic analysis - partim A	Frédéric Gaspart	30h	3 Credits	1q		x

O Courses to be taken in order to reach minimum 25 credits of the module

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

MODULE IN SETTING UP SMALL AND MEDIUM-SIZED BUSINESSES-M13 [25.0]

L'objectif du module CPME est de fournir aux étudiants, créateurs potentiels d'entreprise, les outils d'analyse et de réflexion qui les aideront à comprendre les processus entrepreneuriaux afin de créer ou reprendre une entreprise et de développer des projets de cette nature au sein d'organisations existantes.

En outre, cette formation permet aux étudiants de se familiariser avec d'autres disciplines et d'apprendre à travailler en équipes multidisciplinaires.

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 qui a lieu au moment de la rentrée académique. Une fois sélectionnés, les étudiants prendront 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.

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...)

This module is available for all students whatever option they have taken. Students who choose this interdisciplinary module will write a final paper within the CPME programme. They however to enrol in Year 1 of the master programme. Access to this module is limited. For more information: http://www.uclouvain.be.cpme.html

						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 Courses to be chosen in order to reach minimum 25 credits in the module

This module is spread over the 2 years of the master programme. Contact with the Vice-Dean to organise the programme is mandatory.

ADVANCED MODULE AFEPA-M14 [25.0]

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...)

Courses to be chosen for 15 credits among the 6 subjects of the programme of which 2 are available in the other AFEPA partners institutions. Additional 10 credits (minimum) are to be chosen among the optional courses of which 5 credits are to be used towards a language course.

O Courses offered at UCL among the following courses of Option 14A (15 credits)

⊠ Agricultural and Trade Policy

Offered also at CUB, SLU and Bonn

⊠ LBIRA2105	Agricultural and rural policies	Bruno Henry de Frahan	30h	3 Credits	1q		x
⊠ LECON2041	International Trade	Fabio Mariani, Aminata Sissoko (compensates Fabio Mariani)	30h	5 Credits	2q		x
⊠ LBIRA2104A	Farm Management	Frédéric Gaspart	25h+7.5h	3 Credits	2q		x
⊠ LECON2033	Applied econometrics: Microeconometrics	Muriel Dejemeppe	30h+12h	5 Credits	1q		x
⊠ LECON2370	Industrial Organization and Competition Policy	Mathieu Parenti	30h	5 Credits	1q		x
⊠ LGEO2210	Advanced human geography	Dominique Peeters	30h	3 Credits			x

⊠ Agricultural and Food Sciences

Offered also at UBonn and UPC

⊠ LBIRA2109	Agrarian systems and farm	Mohamed Walid Ben Youssef Sadok, Pierre Bertin (coord.)	45h+7.5h	5 Credits	1q		x
⊠ LBIRA2102	Applied biotechnology	Isabelle Donnay, Xavier Draye, Jacques Mahillon (coord.)	30h+7.5h	4 Credits	1q		x
⊠ 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

⊠ Agricultural and Environmental Sciences

Offered also at Ubonn

⊠ LBIRE2103	General hydrology	Charles Bielders, Marnik Vanclooster (coord.)	30h +22.5h	5 Credits	1q		x
⊠ 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
⊠ LBIRE2102B	APPLIED GEOMATICS	Pierre Defourny	22.5h +7.5h	3 Credits	1q		x

⊠ Rural Development Policy

Offered also at UBonn

⊠ 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
⊠ LBRAI2213	Evaluation of Agricultural Policies	Bruno Henry de Frahan	30h	3 Credits	2q		x
⊠ LECON2033	Applied econometrics: Microeconometrics	Muriel Dejemeppe	30h+12h	5 Credits	1q		x

					Year 1	Year 2
⊠ LECON2312	Macroeconomics of the development	Frédéric Docquier	30h	5 Credits	2q	x
⊠ LECON2314	Economic Geography	Florian Mayneris	30h	5 Credits	2q	x
⊠ LECON2370	Industrial Organization and Competition Policy	Mathieu Parenti	30h	5 Credits	1q	x

Courses to be chosen at UCL for 10 credits (10 credits)

Language courses to be chosen among the following courses (5 credits)

⊠ LANGL1700	Advanced English	Susan Jackman (coord.)	30h	6 Credits	1 ou 2q	x
⊠ LANGL1882	English : reading and listening comprehension of texts in Bioengineering	Isabelle Druant, Sandrine Meirlaen (compensates Isabelle Druant), Annick Sonck (coord.), Anne-Julie Toubeau (compensates Isabelle Druant)	30h	2 Credits	1q	x
⊠ LANGL2480	English Communication Skills for Bioengineers	Ahmed Adrioueche, Isabelle Druant, Dominique François, Annick Sonck (coord.), Anne-Julie Toubeau (compensates Isabelle Druant)	30h	2 Credits	2q	x
⊠ LANGL2600	Entry to professional life : English	Lutgarde Schrijvers	30h	3 Credits	1q	x
⊠ LFRAN1401	French - Upper Intermediate Level (B2) - De la voix à la plume	Geneviève Briet, Emmanuelle Rassart (coord.)	60h	5 Credits	1 ou 2q	x
⊠ LFRAN1403	French - Upper Intermediate Level (B2) - Oral Expression	Françoise Masuy (coord.)	30h	3 Credits	1 ou 2q	x
⊠ LFRAN1404	French ¿ Upper Intermediate Level (B2) ¿ Written expression	Françoise Masuy (coord.)	30h	3 Credits	1 ou 2q	x
⊠ LFRAN1405	French ¿ Upper Intermediate Level (B2) ¿ Le français, langue universitaire	Emmanuelle Rassart	30h	3 Credits	1 ou 2q	x

Other courses

⊠ LBIR1343	Environmental Economics	Frédéric Gaspart	37.5h +7.5h	4 Credits	2q	x
⊠ LBRAT2103	Rural sociology and land development	Daniel Bodson	30h	3 Credits	1q	x
⊠ LECON2312	Macroeconomics of the development	Frédéric Docquier	30h	5 Credits	2q	x
⊠ LECON2314	Economic Geography	Florian Mayneris	30h	5 Credits	2q	x
⊠ LECON2352	Methods for the evaluation of public policies	William Parienté	30h	5 Credits	1q	x
⊠ LECON2604	Advanced International Trade	Florian Mayneris, Mathieu Parenti	30h	5 Credits	1q	x
⊠ LGEO1321	Human and Economic geography 1	Sophie Vanwambeke	25h+25h	4 Credits	2q	x
⊠ LECON2031	Applied Econometrics : Time Series	Zhengyuan Gao	30h+12h	5 Credits	1q	x
⊠ LECON2111	Advanced Microeconomics I: Decision and Game Theory	François Maniquet	30h+6h	5 Credits	1q	x
⊠ LBRAI2208	Firms and Markets : Strategic Analysis	Frédéric Gaspart	30h+15h	5 Credits	1q	x
⊠ LECON2370	Industrial Organization and Competition Policy	Mathieu Parenti	30h	5 Credits	1q	x
⊠ LGEO2130	Geographic modelling	Eric Deleersnijder, Sophie Vanwambeke	30h+30h	5 Credits	2q	x

BIRA2M - 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.

L'admission au programme inter-universitaire Erasmus Mundus AFEPA est soumise à des conditions particulières, **notamment la maîtrise de l'anglais** (www.uclouvain.be/afepa).

- 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			
Bachelier en Sciences de l'ingénieur: orientation bioingénieur	Approfondissement en agronomie	Direct access	
Bachelor in Bioengineering	Additionnal module in Agronomy [30.0](unknown URL)	Direct access	
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.
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 agronomie réputée équivalente introduit un dossier auprès du vice-doyen en mentionnant son curriculum détaillé. Une proposition de cours adaptée est faite à l'étudiante 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 agronomic science. 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 (management, design of new processes etc) combine different kinds of tools (field observation, laboratory analysis, databases, biometrics etc) and various scales in space (from the molecular to plots of land and farms, from an agricultural region to a sub-continent and beyond) 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 agronomic science (applied biology and agricultural production);
- 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 agronomic science. 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 (e.g. integrated fight, crop protection and bioinformatics). 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

Mobility and/or international links

The programme for the Master in Agricultural Bioengineering 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.

In particular, the programme of the Master in Bioengineering (Agronomic Science) offers an option course and an advanced module on Agricultural Economics and Natural Resources, organized in cooperation with the Agrocampus in Rennes (France). Under the ERASMUS exchange agreement, courses on the special subject Agriculture and Resources : Policies and Markets (Politiques et marchés de l'agriculture et des ressources - POMAR) taken at the Agrocampus in Rennes (https://www.agrocampus-rennes.fr/scripts/fr/B_formations/spe/B_ENSAR_spe_pomar.htm) may count towards the option course and the advanced module Agricultural Economics and Natural Resources at UCL.

Possible trainings at the end of the programme

This Master in Bioengineering programme follows on directly from the programme of the Bachelor in Engineering Science (Bioengineering), with an option course in Agronomy.

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 field 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** : doctorate in Agronomic Science 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 : Bruno Henry de Frahan

Jury

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

Usefull Contacts

Information pour les étudiants : Patrick Bogaert (Tel: +32 10 48 37 19)