

**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**

Main study domain : **Sciences agronomiques et ingénierie biologique**

Organized by: **Faculty of bioscience engineering (AGRO)**

Programme acronym: **BIRA2M** - Francophone Certification Framework: 7

## Table of contents

[Introduction](#) .....

## BIRA2M - Introduction

### Introduction

---

## BIRA2M - Teaching profile

### 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 Biological, Agricultural and Environmental 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 :

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 denowlo specNo(igorm [(anagemoachyowingsnswach d define the research question.)] TJ 1 3 0 -1 0 295.1629 0 8 TmngineeTo deomplymaris [(a

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:

- Applis thn 1 0 0 -1 0a toolsm4872 vc, lawsaficulttmetd os 0 -1 0a toolsm475.2vc, 334399872 Tnomicugiesplanalliduc fou 0 -1 0a toolsm480 -1c, 177

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

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 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://uclouvain.be/fr/etudier/ineo>

- on how the Master in Bioengineering programmes work, please contact the Faculty Office.

## BIRA2M Programme

### Detailed programme by subject

#### CORE COURSES [60.0]

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.

- Mandatory
- ✘ Optional
- △ Not offered in 2024-2025
- ⊙ Not offered in 2024-2025 but offered the following year
- ⊕ Offered in 2024-2025 but not the following year
- △ ⊕ Not offered in 2024-2025 or the following year
- Activity with requisites
- 🌐 Open to incoming exchange students
- 🚫 Not open to incoming exchange students
- [FR] Teaching language (FR, EN, ES, NL, DE, ...)

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

Year

1 2

● LBIRA2200	<a href="#">Master thesis</a>		FR [q1+q2] [ ] [27 Credits] 🌐		x
● LBIRA2210	<a href="#">Master thesis' accompanying seminar</a>	Philippe Baret Cathy Debier Frédéric Gaspard Anne Legrève (coord.)	EN [q1+q2] [30h] [3 Credits] 🌐 > French-friendly		x

#### o Projet disciplinaire (10 credits)

● LBIRA2130	<a href="#">Disciplinary project in Agronomy</a>	Philippe Baret Claude Bragard Cathy Debier Xavier Draye Annika Gillis Richard Lambert Anne Legrève Guillaume Lobet Goedele Van den Broeck (coord.)	FR [q2] [100h+0h] [10 Credits] 🌐		x
-------------	--	--	----------------------------------	--	---

#### o Projet intégré (10 credits)

✘ **Projet intégré pour les options 1A, 7A, 8A, 9A, 10A, 11A, 13A et 18A (10 credits)**

				Year	
				1	2
● LBIRA2230	Interdisciplinary project in Agronomy	Marleen Abdel Massih Xavier Draye (coord.) François Gaspard Anne Legrève Caroline Louis Amaury Peeters Goedele Van den Broeck	EQ [q1] [100h+0h] [10 Credits] 		x







## **PROFESSIONAL FOCUS [30.0]**

---

- Mandatory
  - ✘ Optional
  - △ Not offered in 2024-2025
  - ⊗ Not offered in 2024-2025 but offered the following year
  - ⊕ Offered in 2024-2025 but not the following year
  - △ ⊕
-





**OPTION 8A [30.0]**

- Mandatory
- ⊗ Optional
- △ Not offered in 2024-2025
- ⊖ Not offered in 2024-2025 but offered the following year
- ⊕ Offered in 2024-2025 but not the following year
- △ ⊕ Not offered in 2024-2025 or the following year
- Activity with requisites
- 🌐 Open to incoming exchange students
- 🌐 Not open to incoming exchange students
- (FR) Teaching language (FR, EN, ES, NL, DE, ...)

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

Year

1 2

**o Content:**

<p>● LBIRA2108B</p>	<p>Plant production</p>	<p>Yannick Agnan Stephan Declerck Xavier Draye Guillaume Lobet</p>	
---------------------	-------------------------	--	--

## OPTION 9A - PLANT HEALTH [30.0]

---

- Mandatory
  - ✘ Optional
  - △ Not offered in 2024-2025
  - ⊖ Not offered in 2024-2025 but offered the following year
  - ⊕ Offered in 2024-2025 but not the following year
  - △ ⊕ Not offered in 2024-2025 or the following year
  - Activity with requisites
  - 🌐 Open to incoming exchange students
  - 🌐 Not open to incoming exchange students
- 
- [FR][FR][FR][FR]



**OPTION 11A - AGRICULTURAL AND RESOURCE ECONOMICS [30.0]**

- Mandatory
- ⊗ Optional
- △ Not offered in 2024-2025
- ⊙ Not offered in 2024-2025 but offered the following year
- ⊕ Offered in 2024-2025 but not the following year
- △ ⊕ Not offered in 2024-2025 or the following year
- Activity with requisites
- 🌐 Open to incoming exchange students
- 🚫 Not open to incoming exchange students
- [FR] Teaching language (FR, EN, ES, NL, DE, ...)

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

Year






1 2

**o Content:**

● LBRAI2208	Firms and Markets : Strategic Analysis	Frédéric Gaspard	EN [q1] [30h] [4 Credits] 🌐 > French-friendly	X	
● LBRAI2210	Microeconomics of Development	Frédéric Gaspard	EN [q1] [30h] [3 Credits] 🌐 > French-friendly	X	
● LBRAI2212	Economics of Rural Development	Goedele Van den Broeck	EN [q1] [30h] [3 Credits] 🌐 > French-friendly	X	
● LBRAI2213	Impact evaluation in agriculture	Goedele Van den Broeck	EN [q2] [30h+8h] [4 Credits] 🌐 > French-friendly	X	
● LECON2033	Applied econometrics: Microeconometrics	Bertrand Verheyden (compensates Muriel Dejemeppe)	FR [q1] [30h+12h] [5 Credits] 🌐		





				Year	
				1	2
⌘ LBRES2101	Smart technologies for environmental engineering	Sébastien Lambot	EN [q1] [32.5h+20h] [4 Credits]  > French-friendly	X	X
⌘ LBRTI2101A	Data Science in bioscience engineering	Patrick Bogaert Emmanuel Hanert	EN [q1] [22.5h+15h] [3 Credits]  > English-friendly	X	X
⌘ LBRTI2101B	Data Science in bioscience engineering	Patrick Bogaert Emmanuel Hanert	EN [q1] [30h] [2 Credits]  > English-friendly	X	X
⌘ LBRAT2102	Spatial modelling of land dynamics	Pierre Defourny	EN [q2] [15h+15h] [3 Credits]  > French-friendly	X	X
⌘ LBRAT2104A	Land monitoring by advanced earth observation	Sophie Bontemps Pierre Defourny	EN [q2] [22.5h+15h] [3 Credits]  > French-friendly	X	X



**OPTION 18A - HUMAN HEALTH [30.0]**

- Mandatory
- ⊗ Optional
- △ Not offered in 2024-2025
- ⊖ Not offered in 2024-2025 but offered the following year
- ⊕ Offered in 2024-2025 but not the following year
- △ ⊕ Not offered in 2024-2025 or the following year
- Activity with requisites
- 🌐 Open to incoming exchange students
- 🚫 Not open to incoming exchange students
- (FR) Teaching language (FR, EN, ES, NL, DE, ...)

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

Year

1 2

**o Content:**

○ LBIO1237B	<a href="#">Immunology : basis and applications in biology - Lectures</a>	Jean-Paul Dehoux	(FR) [q1] [25h] [3 Credits] 🌐	X	
○ LBIR1342A	<a href="#">Analyse de composés organiques dans des matrices complexes 1 partim A</a>	Sonia Collin	(FR) [q2] [30h] [3 Credits] 🌐	X	
○ LBIRC2109A	<a href="#">Process engineering: Unit operations</a>	Damien Debecker	(FR) [q2] [30h+7.5h] [3 Credits] 🌐 > English-friendly	X	
○ LBRAL2102	<a href="#">Physiological and nutritional biochemistry</a>	Cathy Debier (coord.) Emeline Dierge	(EN) [q1] [37.5h+0h] [4 Credits] 🌐 > French-friendly	X	





## Course prerequisites

---

There are no prerequisites between course units (CUs) for this programme, i.e. the programme activity (course unit, CU) whose learning outcomes are to be certified and the corresponding credits awarded by the jury before registration in another CU.

## The programme's courses and learning outcomes

---

For each UCLouvain training programme, a [reference framework of learning outcomes](#) specifies the skills expected of every graduate on completion of the programme. Course unit descriptions specify targeted learning outcomes, as well as the unit's contribution to reference framework of learning outcomes.

## BIRA2M - Information

### Access Requirements

Master course admission requirements are defined by the French Community of Belgium Decree of 7 November 2013 defining the higher education landscape and the academic organisation of courses.

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

Unless explicitly mentioned, the bachelor's, master's and licentiate degrees listed in this table or on this page are to be understood as those issued by an institution of the French, Flemish or German-speaking Community, or by the Royal Military Academy.

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

#### SUMMARY

- > [General access requirements](#)
- > [Specific access requirements](#)
- > [University Bachelors](#)
- > [Non university Bachelors](#)
- > [Holders of a 2nd cycle University degree](#)
- > [Access based on validation of professional experience](#)
- > [Access based on application](#)
- > [Admission and Enrolment Procedures for general registration](#)

### University Bachelors

Diploma	Special Requirements	Access	Remarks
<b>UCLouvain Bachelors</b>			
<a href="#">Bachelor in Bioengineering</a>	Approfondissement en agronomie	Direct access	
Autres bacheliers UCL			



BA en agronomie, orientation agronomie des régions chaudes - crédits supplémentaires entre 45 et 60  
 BA en agronomie, orientation environnement - crédits supplémentaires entre 45 et 60  
 BA en agronomie, orientation forêt et nature - crédits supplémentaires entre 45 et 60  
 BA en agronomie, orientation systèmes alimentaires durables et locaux - crédits supplémentaires entre 45 et 60  
 BA en agronomie, orientation techniques et gestion agricoles - crédits supplémentaires entre 45 et 60  
 BA en agronomie, orientation techniques et gestion horticoles - crédits supplémentaires entre 45 et 60  
 BA en agronomie, orientation technologie animalière - crédits supplémentaires entre 45 et 60  
 BA en chimie, orientation biochimie - crédits supplémentaires entre 45 et 60  
 BA en chimie, orientation biotechnologie - crédits supplémentaires entre 45 et 60  
 BA en chimie, orientation chimie appliquée - crédits supplémentaires entre 45 et 60  
 BA en chimie, orientation environnement - crédits supplémentaires entre 45 et 60

peuvent être consultés dans le [module complémentaire](#).

### Holders of a 2nd cycle University degree

Diploma	Special Requirements	Access	Remarks
<b>"Licenciés"</b>			
<b>Masters</b>			
			<a href="#">Access based on application</a>
			<a href="#">Access based on application</a>
			<a href="#">Access based on application</a>

### Access based on validation of professional experience

> It is possible, under certain conditions, to use one's personal and professional experience to enter a university course without having the required qualifications. However, validation of prior experience does not automatically apply to all courses. Find out more about [Validation of priori experience](#).

### Access based on application

Access based on application : access may be granted either directly or on the condition of completing additional courses of a maximum of 60 ECTS credits, or refused.

### 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 (BIRC13BA, BIRA

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 Faculttnership

