

**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: **BIRE2M** - Francophone Certification Framework: 7

## Table of contents

Introduction .....	2
Teaching profile .....	3
Learning outcomes .....	3
Programme structure .....	5
Programme .....	5
Detailed programme by subject .....	5

## BIRE2M - Introduction

### Introduction

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## BIRE2M - Teaching profile

### Learning outcomes

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

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

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

- professionals able to tackle and diagnose environmental problems: the management and use of resources (soil, water, plants) and ecosystems, land management;
- scientists able to understand complex processes on different scales, used to multidisciplinary approaches and able to collaborate with other specialists;
- innovators tasked with developing new resource management methods that respect the environment.

Highly versatile and multidisciplinary in character, the course dispensed by the Faculty of 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 understand and conceptualise biological, agricultural and environmental systems.

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

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

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

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

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

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

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

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

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

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

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

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

2. To explore an integrated body of "engineering and management knowledge" which serves as the foundation from which to operate







⌘ Alternative program of the stage for option 5E (10 credits)

**PROFESSIONAL FOCUS [30.0]**

- Mandatory
- ⊗ Optional
- △ Not offered in 2023-2024
- ⊙ Not offered in 2023-2024 but offered the following year
- ⊕ Offered in 2023-2024 but not the following year
- △ ⊕ Not offered in 2023-2024 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

○ **Content:**

○ **Finalité spécialisée**

○ LBIRE2102	Applied geomatics	Pierre Defourny	FR [q1] [30h+22.5h] [4 Credits] 🌐 > English-friendly	X	
○ LBIRE2104	Applied soil sciences	Yannick Agnan (coord.) Pierre Delmelle (coord.) Hugues Titeux (compensates Pierre Delmelle)	FR [q1] [22.5h+22.5h] [4 Credits] 🌐 > English-friendly	X	
○ LBIRE2105	Assessment of water - soil - air quality	Yannick Agnan (coord.) Philippe Maetz Xavier Rollin	FR [q1] [30h+0h] [3 Credits] 🌐	X	
○ LBIRE2205A	Decision tools and project management - Decision tools	Raphaël Amory Frédéric Gaspart	EN [q1] [22.5h+7.5h] [3 Credits] 🌐 > French-friendly		X

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## OPTIONS

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Students in this programme have a choice of 5 options followed by a complement to the chosen option in the second year of the programme.

Students who wish to take the INEO module have to enrol in their first year of the master programme. It will be considered however as a complement to the option chosen in the first year.

Students have also the opportunity to take optionnal courses either from a suggested list or from another programme at UCL. In this case, the choice has to be validated by the Study Counsellor. Prior to that, the student must obtain an authorization from the lecturer of the course.

### Option 4E - Pollution management

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- > [Option 4E - Pollution management](#) [ en-prog-2023-bire2m-lbire204o ]
- > [Complement to the option 4E : Pollution management](#) [ en-prog-2023-bire2m-lbire214o ]

### Option 5E - Land Use Planning

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- > [Option 5E - Land Use Planning](#) [ en-prog-2023-bire2m-lbire205o ]
- > [Option's complement 5E - Land Use Planning](#) [ en-prog-2023-bire2m-lbire215o ]

### Option 7E - Water and Soil ressources

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- > [Option 7E- Water and Soil Resources](#) [ en-prog-2023-bire2m-lbire207o ]
- > [Option's complement 7E - Water and soil resources](#) [ en-prog-2023-bire2m-lbire217o ]

### Option 10E - Data science

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- > [Option 10E - Data science](#) [ en-prog-2023-bire2m-lbire210o ]
- > [Option's complement - Data science](#) [ en-prog-2023-bire2m-lbire111o ]

### Option 12E - Sustainability engineering

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- > [Option 12E : Sustainability engineering](#) [ en-prog-2023-bire2m-lbire212o ]
- > [Option's complement - Sustainability engineering](#) [ en-prog-2023-bire2m-lbire120o ]

### Option 13E- Business Creation

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- > [Business Creation \(13E\)](#) [ en-prog-2023-bire2m-lbire250o ]

## OPTION 4E - POLLUTION MANAGEMENT

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### OPTION 4E - POLLUTION MANAGEMENT [23.0]

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- Mandatory
- ⊗ Optional
- △ Not offered in 2023-2024
- ⊙ Not offered in 2023-2024 but offered the following year
- ⊕ Offered in 2023-2024 but not the following year
- △ ⊕ Not offered in 2023-2024 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...)

*This option will be followed by the corresponding option complement OR by "the Business Creation".*

## o Content:

○ LBIR1346	Surface and colloid chemistry	Christine Dupont (coord.) Aurélien vander Straeten (compensates Christine Dupont)	FR [q2] [30h] [3 Credits]	X	
○ LBRES2101B	Smart technologies for environmental engineering	Sébastien Lambot	EN [q1] [22.5h+15h] [3 Credits] > French-friendly	X	
○ LBRES2103	Soil physics applied to Agronomy and Environment	Charles Bielders (coord.) Mathieu Javaux	FR [q1] [30h+15h] [4 Credits]	X	
○ LBRES2218A	Soil and water resources management and environmental technologies professional seminars	Charles Bielders Marnik Vanclooster	FR [q1] [20h+0h] [2 Credits]	X	X
○ LB RTE2102	Integrated exercises in environmental science and technology	Alice Alonso (compensates Marnik Vanclooster) Patrick Gerin (coord.) Mathieu Javaux	FR [q2] [45h] [5 Credits] > English-friendly	X	
○ LB RTE2201	Human and environmental toxicology	Cathy Debier	EN [q1] [30h+7.5h] [4 Credits] > French-friendly		X
○ LBRTI2101B	Data Science in bioscience engineering	Patrick Bogaert Emmanuel Hanert	FR [q2] [130h] [3 Credits] > English-friendly		







*OPTION 7E - WATER AND SOIL RESSOURCES*

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***OPTION 7E- WATER AND SOIL RESOURCES [23.0]***

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- Mandatory
  - ✘ Optional
  - △ Not offered in 2023-2024
  - ⊖ Not offered in 2023-2024 but offered the following year
  - ⊕ Offered in 2023-2024 but not the following year
  - △ ⊕ Not offered in 2023-2024 or the following year
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				Year	
				1	2
○ LBIRE2233	Integrated project in water and soil resources management	Charles Bielders (coord.) Mathieu Javaux Marnik Vanclooster	EN [q1] [50h+10h] [6 Credits] 		x
○ LBRES2206	Advanced Hydrology for Engineers	Quentin Goor (compensates Mathieu Javaux) Mathieu Javaux (coord.)	EN [q1] [22.5h+15h] [3 Credits]  > <i>French-friendly</i>		x

*OPTION 10E - DATA SCIENCE [23.0]*

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***OPTION 10E - DATA SCIENCE [23.0]***

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- Mandatory
- ✘ Optional
- △ Not offered in 2023-2024
- ⊖ Not offered in 2023-2024 but offered the following year
- ⊕ Offered in 2023-2024 but not the following year
- △ ⊕ Not offered in 2023-2024 or the following year
- Activity with requisites
- 🌐 Open to incoming exchange students
- 🚫🌐 Not open to incoming exchange students

[FR]

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● LENVI2007A

**OPTION'S COMPLEMENT - SUSTAINABILITY ENGINEERING [20.0]**

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- Mandatory
- ✘ Optional
- △ Not offered in 2023-2024
- ⊖ Not offered in 2023-2024 but offered the following year
- ⊕ Offered in 2023-2024 but not the following year
- △ ⊕ Not offered in 2023-2024 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, ...)

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

Year

**1 2****o Content:**

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● LBRTI2102	Process-based modelling in bioscience engineering	Emmanuel Hanert	EN
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## Supplementary classes


**To access this Master, students must have a good command of certain subjects. If this is not the case, students must take supplementary classes chosen by the faculty to satisfy course prerequisites.**

- Mandatory
- ⊗ Optional
- △ Not offered in 2023-2024
- ⊙ Not offered in 2023-2024 but offered the following year
- ⊕ Offered in 2023-2024 but not the following year
- △ ⊕ Not offered in 2023-2024 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...)

### ○ Cours passerelle pour le master en bioingénieur, orientation chimie gestion des forêts et espaces naturels ET sciences et technologies de l'environnement (44 credits)

○ LANGL2480	<a href="#">English Communication Skills for Bioengineers</a>	Ahmed Adriouche Ariane Halleux Lucille Meyers Philippe Neyt Charlotte Peters (coord.) Adrien Pham Anne-Julie Toubeau (coord.)	EN [q2] [30h] [2 Credits] 🌐 > French-friendly
○ LBIR1315	<a href="#">Probability and statistics II</a>	Patrick Bogaert	FR [q1] [22.5h+22.5h] [3 Credits] 🌐
○ LBIR1325A	<a href="#">Transfer of fluids and energy for Bio-engineer</a>	Yann Bartosiewicz Quentin Goor (compensates Mathieu Javaux) Marnik Vanclooster	FR [q1] [37.5h+22.5h] [5 Credits] 🌐
○ LBIR1325B	<a href="#">Transfer of fluids and energy for Bio-engineer</a>	Yann Bartosiewicz Quentin Goor (compensates Mathieu Javaux) Marnik Vanclooster	FR [q2] [0h+30h] [2 Credits] 🌐
○ LBIR1328	<a href="#">Climatology and hydrology applied to agronomy and the environment</a>	Alice Alonso (compensates Marnik Vanclooster) Charles Bielders (coord.) Hugues Goosse	FR [q1] [45h+22.5h] [6 Credits] 🌐 > French-friendly
○ LBIR1334	<a href="#">Introduction to forest science</a>	Quentin Ponette (coord.) Caroline Vincke	FR [q2] [22.5h+15h] [3 Credits] 🌐 > English-friendly
○ LBIR1336	<a href="#">Soil science and integrated excursions</a>	Yannick Agnan (coord.) Richard Lambert Caroline Vincke	FR [q2] [30h+37.5h] [5 Credits] 🌐 > English-friendly
○ LBIR1349	<a href="#">Analytical Chemistry I</a>	Christine Dupont (coord.) Yann Garcia Yann Garcia (compensates Christine Dupont)	FR [q1] [30h+15h] [3 Credits] 🌐
○ LBIR1350	<a href="#">General Microbiology</a>	Annika Gillis	FR [q2] [37.5h+15h] [4 Credits] 🌐
○ LBIR1351	<a href="#">Introduction to systems analysis</a>	Philippe Baret Océane Duluins (compensates Philippe Baret)	FR [q1] [10h+20h] [3 Credits] 🌐
○ LBIR1354	<a href="#">Biologie des interactions</a>	Anne-Laure Jacquemart (coord.) Anne Legrève	FR [q2] [22.5h+15h] [3 Credits] 🌐
○ LBIR1360	<a href="#">Firm management and organisation</a>	Pierre De Muelenaere	EN [q1] [30h+7.5h] [3 Credits] 🌐 > French-friendly

○ LBIR1362	Environmental Economics	Frédéric Gaspart	EN [q2] [30h+7.5h] [3 Credits] 
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### ○ Cours spécifiques (11 credits)

○ LBIR1260	Principles of economics	Goedele Van den Broeck	EN [q1] [30h+15h] [4 Credits]  > French-friendly
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### ○ Courses to be chosen for 7 credits (7 credits)

Activités au choix libre dans l'un des programmes de bachelier du Secteur des Sciences et Technologies : <https://uclouvain.be/fr/etudier/les-facultes.html>

Minimum 7 credit(s)

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## Course prerequisites

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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

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For each UCLouvain training programme, a [reference framework of learning outcomes](#) specifies the 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.

## BIRE2M - Information

### Access Requirements

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(max.60 crédits). Prendre obligatoirement contact avec le Conseiller aux études.

Access based on application

## Non university Bachelors

> Find out more about [links](#) to the university

Diploma	Access	Remarks
BA en agronomie, orientation agro-industries et biotechnologies - crédits supplémentaires entre 45 et 60		
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 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 animale - crédits supplémentaires entre 45 et 60		
BA en chimie, orientation biochimie - crédits supplémentaires		





## Contacts

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### Curriculum Management

#### Faculty

Structure entity	SST/AGRO
Denomination	Faculty of bioscience engineering ( <a href="#">AGRO</a> )
Sector	Sciences and Technology ( <a href="#">SST</a> )
Acronym	AGRO
Postal address	Croix du Sud 2 - bte L7.05.01 1348 Louvain-la-Neuve Tel: <a href="tel:+32210473719">+32 (0) 10 47 37 19</a> - Fax: <a href="tel:+32210474745">+32 (0) 10 47 47 45</a> <a href="http://www.uclouvain.be/agro">http://www.uclouvain.be/agro</a>
Website	<a href="http://www.uclouvain.be/agro">http://www.uclouvain.be/agro</a>

#### Mandate(s)

- Dean : Christine Dupont
- Administrative director : Carole Dekelver

#### Commission(s) of 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](#))
- Fermes universitaires de Louvain ([FERM](#))

Academic supervisor: [Charles Bielders](https://uclouvain.be/repertoires/charles.bielders) (<https://uclouvain.be/repertoires/charles.bielders>)

#### Jury

- Président: [Quentin Ponette](https://uclouvain.be/repertoires/quentin.ponette) (<https://uclouvain.be/repertoires/quentin.ponette>)
- Secrétaire de jury de la 2<sup>ème</sup> année de master: [Sophie Opfergelt](https://uclouvain.be/repertoires/sophie.opfergelt) (<https://uclouvain.be/repertoires/sophie.opfergelt>)

#### Useful Contact(s)

- Information pour les étudiants par le Conseiller aux études: [Pierre Bertin](https://uclouvain.be/repertoires/pierre.bertin) (<https://uclouvain.be/repertoires/pierre.bertin>)

