BIRE2M - Introduction

Introduction

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

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

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

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

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

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

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

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

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

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

CORE COURSES [47.0]

- O Mandatory
- ⊠ Optional
- △ Not offered in 2024-2025

Year
1 2

⊠ LECSO2330	

PROFESSIONAL FOCUS [30.0]

- O Mandatory
- ⊠ Optional
- △ Not offered in 2024-2025
- ⊘ Not offered in 2024-2025 but offered the following year
- ⊕

OPTIONS

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 *[en-prog-2024-bire2m-lbire204o]*
> Complement to the option 4E : Pollution management *[en-prog-2024-bire2m-lbire214o]*
> Option 5E - Land Use Planning *[en-prog-2024-bire2m-lbire205o]*
> Option's complement 5E - Land Use Planning *[en-prog-2024-bire2m-lbire215o]*
> Option 7E- Water and Soil Resources *[en-prog-2024-bire2m-lbire207o]*
> Option's complement 7E - Water and soil resources *[en-prog-2024-bire2m-lbire217o]*
> Option 10E - Data science *[en-prog-2024-bire2m-lbire210o]*
> Option's complement - Data science *[en-prog-2024-bire2m-lbire111o]*
> Option 12E : Sustainability engineering *[en-prog-2024-bire2m-lbire212o]*
> Option's complement - Sustainability engineering *[en-prog-2024-bire2m-lbire120o]*
> Business Creation (13E) *[en-prog-2024-bire2m-lbire250o]*

OPTION 4E - POLLUTION MANAGEMENT [23.0]

O 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

Year

Year
1 2

OPTION 7E- WATER AND SOIL RESOURCES [23.0]

- 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...)

Content:

				Year 1	Year 2
LBRES2101B	Smart technologies for environmental engineering	Sébastien Lambot	EN [q1] [22.5h+15h] [3 Credits] *> French-friendly*	x	
LBRES2103					

OPTION'S COMPLEMENT - DATA SCIENCE [20.0]

- 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

LBIR1325B

Year
1 2

Unité d'enseignement obligatoire pour l'étudiant·e qui ne l'aurait pas créditée en Bachelier (2 credits)

LBIR1325B	Transfer of fluids and energy for Bio-engineer	Yann Bartosiewicz Quentin Goor (compensates Mathieu Javaux) Marnik Vanclooster	FR [44 Tf 1 Tf85999.417 1 cm 0 0 m 198.42g /F BT /F7 6.

OPTION'S COMPLEMENT - SUSTAINABILITY ENGINEERING [20.0]

- 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...)

Content:

			Year 1	Year 2
LBRTI2102	Process-based modelling in bioscience engineering	Emmanuel Hanert	EN	

				Year 1	2
LINEO2003	Plan d'affaires et étapes-clefs de la création d'entreprise	Frank Janssen	[FR] [q2] [30h+15h] [5 Credits]		x
LINEO2004	Séminaire d'approfondissement en entrepreneuriat	Frank Janssen	[FR] [q2] [30h+15h] [5 Credits]	x	

Supplementary classes

To access this Master, students must have a good command of certain subjects. If this is not the case, in the first annual block of their Masters programme, students must take supplementary classes chosen by the faculty to satisfy course prerequisites.

- 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...)

Unités d'enseignement passerelle pour le master Bioingénieur en sciences et technologies de l'environnemnt ET Bioingénieur en gestion des forêts et des espaces naturels (44 credits)

LANGL2480	English Communication Skills for Bioengineers	Ahmed Adrioueche Ariane Halleux Lucille Meyers Philippe Neyt Charlotte Peters (coord.) Adrien Pham Anne-Julie Toubeau (coord.)	[EN] [q2] [30h] [2 Credits] *> French-friendly*
LBIR1315	Probability and statistics II	Patrick Bogaert	[FR] [q1] [22.5h+22.5h] [3 Credits]
LBIR1325A	Transfer of fluids and energy for Bio-engineer	Yann Bartosiewicz Quentin Goor (compensates Mathieu Javaux) Marnik Vanclooster	[FR] [q1] [37.5h+22.5h] [5 Credits]
LBIR1325B	Transfer of fluids and energy for Bio-engineer	Yann Bartosiewicz Quentin Goor (compensates Mathieu Javaux) Marnik Vanclooster	[FR] [q2] [0h+30h] [2 Credits]
LBIR1328	Climatology and hydrology applied to agronomy and the environment	Alice Alonso (coord.) Charles Bielders (coord.) Hugues Goosse	[EN] [q1] [45h+22.5h] [6 Credits] *> French-friendly*
LBIR1334	Introduction to forest science	Quentin Ponette (coord.) Caroline Vincke	[EN] [q2] [22.5h+15h] [3 Credits] *> English-friendly*
LBIR1336	Soil science and integrated excursions	Yannick Agnan (coord.) Richard Lambert Caroline Vincke	[EN] [q2] [30h+37.5h] [5 Credits] *> English-friendly*
LBIR1349	Analytical Chemistry I	Christine Dupont (coord.) Yann Garcia Yann Garcia (compensates Christine Dupont)	[FR] [q1] [30h+15h] [3 Credits]

LBIR1350	General Microbiology	Annika Gillis	FR [q2] [37.5h+15h] [4 Credits]

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 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

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

University Bachelors

Diploma	Special Requirements	Access	Remarks
UCLouvain Bachelors			
Bachelor in Bioengineering	Additionnal module in Environment	Direct access	
Autre Bachelier UCL du domaine des sciences et technologies		Access based on application	Le/la futur·e étudiant·e rencontrera obligatoirement le Conseiller aux études pour déterminer le programme à suivre.
Others Bachelors of the French speaking Community of Belgium			
Bachelier en sciences de l'ingénieur, orientation bioingénieur		Direct access	Enseignements supplémentaires à déterminer selon le programme suivi antérieurement (max.15 crédits). Prendre obligatoirement contact avec le Conseiller aux études.
		Access based on application	
Bachelors of the Dutch speaking Community of Belgium			
Bachelor of Science in de bio-ingenieurswetenschappen		Direct access	Enseignements supplémentaires à déterminer selon le programme suivi antérieurement (max.15 crédits). Prendre obligatoirement contact avec le Conseiller aux études.
		Access based on application	
Foreign Bachelors			
Bachelier en sciences de l'ingénieur, orientation bioingénieur		Access based on application	Sous réserve d'acceptation du dossier. Enseignements supplémentaires à déterminer selon le programme suivi antérieurement

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) :

- programme designed for the BIR students starting from Year 1
- special programme in second year for all the BIR students
- distinct programme with 30 credits for option courses in third year : three advanced subsidiary subjects available : chemistry , agronomy , environment.

2nd cycle (Master) :

- choice of four Masters in Bioengineering with a professional focus, together with a number of options 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 options, which partly overlap at the level of the four Masters in Bioengineering, correspond to fields of activity identified on the basis of a wide-ranging survey of graduates of the Faculty working professionally and of contacts with potential employers.

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

- availability of courses organized by other faculties ;
- grouping of training activities : combined exercises, joint project, analysis of real situations, simulations ;