





## BIR1BA - Teaching profile

### Learning outcomes

Bachelor in Bioengineering students must undertake to gain a good grounding in order to tackle the training provided in the various Masters organised by the Faculty of Biological, Agricultural and Environmental Engineering.

The objective is to develop into individuals working towards a better reconciliation of human activities and respect for the environment, developing sustainable responses to the major challenges facing our societies today and tomorrow, and improving our quality of life.

The Bachelor programme of study allows students to acquire a broad knowledge base and scientific and technological expertise in the life sciences field, allowing them to understand and conceptualise biological, agricultural and environmental systems.

Through multidisciplinary training, the future bioengineering graduate will develop their training and personal project which they will work on during their Masters programme, and do so with increasing independence.

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

1. To use a body of knowledge (knowledge, methods and techniques, models and processes) in life and human sciences in the fields of agricultural, biological chemical and environmental engineering.

1.1 To know and understand the fundamentals and basic concepts of the fundamental sciences (core courses), to master their formalism and more specifically to do so for the following subjects:

- Mathematics, analysis and data-processing: general mathematics, probability and statistics
- Material sciences: general, organic and analytical chemistry, general physics
- Life sciences: cell, plant and animal biology, plant physiology, biochemistry, genetics, microbiology
- Earth sciences and ecosystems: earth sciences and biosphere engineering

1.2 To know and understand the basic concepts as part of an introduction to philosophy and economics.

1.3 To master a body of knowledge in one of the bioengineering fields (additional module):

- Additional module on agriculture or the environment:
- Life sciences: physiology of the development and systematics of plants of agronomic interest, Animal Physiology (additional module on agronomy only)
- Earth sciences and ecosystems: soil science, bioclimatology, applied ecology, forest science (additional module on environment only)
- Human sciences: environmental economics
- Additional modules on chemistry, material sciences: physical chemistry, organic and analytical chemistry, organic analysis: separation techniques, colloid and surface chemistry

1.4 To master the fundamental experimental techniques in chemistry, physics, biology, earth sciences.

1.5 To use knowledge critically when faced with a simple problem.

1.6 Using several strands of knowledge (to articulate concepts from different fields) to understand a multidisciplinary problem.

2. To make critical use of a body of "engineering and management knowledge" with expertise in the fields of agricultural, biological, chemical and environmental engineering.

2.1 To know and understand the fundamentals, concepts and basic tools in engineering sciences.

- Mathematics, analysis and data-processing: IT and applied mathematics, systems analysis, transfer phenomena
- Earth sciences and ecosystems: biosphere engineering
- Human sciences: business operation and management; environmental economics (only for additional modules on agronomy and environment)
- Material sciences (only for additional modules on chemistry): thermodynamics

2.2 To understand and use the basic tools in engineering sciences (e.g.: Information technology tools, programming, etc.)

2.3 To activate and use their knowledge of engineering with a critical mind and to tackle a simple problem using a quantitative approach.

2.4 To know and understand the basic concepts and major theories in management.

3. To apply an appropriate methodology for research, implementing an analytical scientific and, if applicable, systematic approach in order to consider an original research problem in more depth relevant to agricultural, biological, chemical and environmental engineering, 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 abomu.f to0 0 -1 0 581.1er to consider*



## Programme structure

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This programme which leads to the title of "Bachelor of Engineering Sciences : Bioengineering", is composed of three years of studies.













**BIR1BA - 1ST ANNUAL UNIT**

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- 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, ...)

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


**o Major**

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**o Mathematics, data analysis**

● LBIR1110	<a href="#">Introduction to analysis</a>	Emmanuel Hanert	(FR) [q1] [30h +30h] [6 Credits] 🌐
● LBIR1111			

### o Human Sciences

<p>o LANGL1881</p>	<p>English : reading and listening comprehension of texts in Bioengineering</p>	<p>Charline Coduti (compensates Anne-Julie Toubeau) Ariane Halleux Sandrine Meirlaen (coord.) Yannick Paquin (compensates Anne-Julie Toubeau) Marine Volpe (compensates Amandine Dumont)</p>	<p>ES [q1] [30h] [2 Credits] </p>
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### o Projects and Soft skills

<p>o LBIR1170</p>	<p>Projet appliqué en Chimie</p>	<p>Christine Dupont (coord.) Michel Ghislain Thibaut Huybrechts (compensates Christine Dupont)</p>	<p>ES [q2] [30h +60h] [5 Credits] </p>
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**BIR1BA - 2ND ANNUAL UNIT**

- 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...)

**o Major****o Mathematics, data analysis**

○ LBIR1211	<a href="#">Analysis of multivariate functions</a> ■	Emmanuel Hanert	(FR) [q1] [30h +30h] [5 Credits] 🌐
○ LBIR1212	<a href="#">Probabilities and statistics (I)</a> ■	Patrick Bogaert	(FR) [q1] [30h +15h] [4 Credits] 🌐

**o Sciences et ingénierie de la matière et des procédés**

○ LBIR1221	<a href="#">Wave, optical and modern physics</a> ■	Bruno Bertrand (coord.) Jean-Christophe Charlier	(FR) [q2] [30h +30h] [5 Credits] 🌐
○ LCHM1211A	<a href="#">Chimie générale 2</a> ■	Yann Garcia Tom Leyssens	(FR) [q2] [30h +30h] [5 Credits] 🌐
○ LCHM1244	<a href="#">Organic chemistry 2: deepening of basic concepts</a> ■	Olivier Riant	(FR) [q1] [30h +22.5h] [4 Credits] 🌐

**o Life Sciences**

○ LBIR1250	<a href="#">Biochemistry I</a> ■		
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○ LBIR1260

Principles of economics 🇺🇸

Goedele Van  
den Broeck

EN [q1]  
[30h  
+15h] [4  
Credits] 🌐  
> *French-  
friendly*

## **BIR1BA - 3RD ANNUAL UNIT**

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- 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, ...)

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

### **o Major**

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#### **o Mathematics, data analysis**

o Choice of an option





## BIR1BA - Information

### Access Requirements

Decree of 7 November 2013 defining the landscape of higher education and the academic organization of studies.

The admission requirements must be met prior to enrolment in the University.

**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](#)
- [Access based on validation of professional experience](#)
- [Special requirements to access some programmes](#)

### General access requirements

Except as otherwise provided by other specific legal provisions, admission to undergraduate courses leading to the award of a Bachelor's degree will be granted to students with one of the following qualifications :

1. A Certificate of Upper Secondary Education issued during or after the 1993-1994 academic year by an establishment offering full-time secondary education or an adult education centre in the French Community of Belgium and, as the case may be, approved if it was issued by an educational institution before 1 January 2008 or affixed with the seal of the French Community if it was issued after this date, or an equivalent certificate awarded by the Examination Board of the French Community during or after 1994;
2. A Certificate of Upper Secondary Education issued no later than the end of the 1992-1993 academic year, along with official documentation attesting to the student's ability to pursue higher education for students applying for a full-length undergraduate degree programme;
3. A diploma awarded by a higher education institution within the French Community that confers an academic degree issued under the above-mentioned Decree, or a diploma awarded by a university or institution dispensing full-time higher education in accordance with earlier legislation;
4. A higher education certificate or diploma awarded by an adult education centre;
5. A pass certificate for one of the [entrance examinations](#) organized by higher education institutions or by an examination board of the French Community; this document gives admission to studies in the sectors, fields or programmes indicated therein;
6. A diploma, certificate of studies or other qualification similar to those mentioned above, issued by the Flemish Community of Belgium, the German Community of Belgium or the Royal Military Academy;
7. A diploma, certificate of studies or other qualification obtained abroad and deemed equivalent to the first four mentioned above by virtue of a law, decree, European directive or international convention;

#### Note:

Requests for equivalence must be submitted to the Equivalence department ([Service des équivalences](#)) of the Ministry of Higher Education and Scientific Research of the French Community of Belgium in compliance with the official deadline.

The following two qualifications are automatically deemed equivalent to the Certificate of Upper Secondary Education (Certificat d'enseignement secondaire supérieur – CESS):

- European Baccalaureate issued by the Board of Governors of a European School,
- International Baccalaureate issued by the International Baccalaureate Office in Geneva.

8. Official documentation attesting to a student's ability to pursue higher education (diplôme d'aptitude à accéder à l'enseignement supérieur - DAES), issued by the Examination Board of the French Community.

### Specific access requirements

- Access to bachelor programmes for candidates of nationality outside the European Union who are not assimilated to Belgian nationals is subject to the following criteria:
  - not have obtained a secondary education diploma for more than 3 years maximum. Example: for an admission application for the academic year 2024-2025, you must have obtained your diploma during the academic years 2021-2022, 2022-2023 ou 2023-2024. In the French Community of Belgium, the academic year runs from September 14 to September 13
  - not already hold an undergraduate degree
- Candidates, whatever their nationality, with a secondary school diploma **from a country outside the European Union**, must have obtained an average of 13/20 minimum or, failing that, have obtained this average, have passed one year of study in Belgium (for example special Maths / sciences). A non-successful year will not be taken into consideration.

- For any secondary school diploma **from a European Union country**, the admission request must contain the equivalence of your diploma or, at the very least, proof of the filing of the equivalence request with the Wallonia-Brussels Federation (French Community of Belgium). For any information relating to obtaining an equivalence, please refer to [the following site](#).
- For any secondary school diploma **from a country outside the European Union**, the admission application must contain the [equivalence of your diploma](#) issued by the Wallonia-Brussels Federation (French Community of Belgium). If you have a restrictive equivalence for the programme of your choice, in addition of it, you **must** have either the [DAES](#) or a certificate of successful completion of the [examination giving access to 1<sup>st</sup> cycle studies](#) when you submit your application

## Access based on validation of professional experience

Admission to undergraduate studies on the basis of accreditation of knowledge and skills obtained through professional or personal experience (Accreditation of Prior Experience)

Subject to the general requirements laid down by the authorities of the higher education institution, with the aim of admission to the undergraduate programme, the examination boards accredit the knowledge and skills that students have obtained through their professional or personal experience.

This experience must correspond to at least five years of documented activity, with years spent in higher education being partially taken into account: 60 credits are deemed equivalent to one year of experience, with a maximum of two years being counted. At the end of an assessment procedure organized by the authorities of the higher education institution, the Examination Board will decide whether a student has sufficient skills and knowledge to successfully pursue undergraduate studies.

After this assessment, the Examination Board will determine the additional courses and possible exemptions constituting the supplementary requirements for the student's admission.

## Special requirements to access some programmes

- Admission to **undergraduate studies in engineering: civil engineering and architect**

Pass certificate for the [special entrance examination for undergraduate studies in engineering: civil engineering and architect](#).

Admission to these courses is always subject to students passing the special entrance examination. Contact the faculty office for the programme content and the examination arrangements.

- Admission to **undergraduate studies in veterinary medicine**

[Admission to undergraduate studies in veterinary medicine is governed by the Decree of 16 June 2006 regulating the number of students in certain higher education undergraduate courses \(non-residents\)](#).

- Admission to **undergraduate studies in physiotherapy and rehabilitation**

[Admission to undergraduate studies in physiotherapy and rehabilitation is governed by the Decree of 16 June 2006 regulating the number of students in certain higher education undergraduate courses \(non-residents\)](#).

- Admission to **undergraduate studies in psychology and education: speech and language therapy**

[Admission to undergraduate studies in psychology and education: speech and language therapy is governed by the Decree of 16 June 2006 regulating the number of students in certain higher education undergraduate courses \(non-residents\)](#).

- Admission to **undergraduate studies in medicine and dental science**

[Admission to undergraduate studies in medicine and dental science is governed by the Decree of 16 June 2006 regulating the number of students in certain higher education undergraduate courses \(non-residents\)](#).

Note: students wishing to enrol for a **Bachelor's degree in Medicine** or a **Bachelor's degree in dental science** must first sit an [aptitude test \(fr\)](#).

- Access to **Bachelor of Science in Business Engineering**

The Bachelor of Science in Business Engineering is a joint program organised by KU Leuven and UCLouvain Saint-Louis Bruxelles. In order to register, all candidate must first submit an application via the [KU Leuven admission platform](#). The [conditions of access](#) to this programme are specific.





