



BA-IRBI | 2024-2025

# Bachelor in Bioengineering

The 2024-2025 programme is subject to change. It is provided for information purposes only.

## Programme mnemonic

BA-IRBI

## Studies level

Bachelor

## Learning language

french

## Schedule

office hours

## Studies categories / subcategories

Sciences and technics / Agronomy and bioengineering and / Sciences and technics

## Campus

Plaine and Solbosch

teaching enabling students to get in touch with a variety of sciences in general and engineering sciences in particular.

Learning by doing, through the implementation of projects in group, with coaching by a dedicated tutor, gets a lot of attention. On top of the help of professors and their assistants, each student can count on the support of a coaching teams organized per discipline. Stays abroad are offered at the Master's level but the study programs are tailored to the student's profile already at the end of the Bachelor,

Bioengineers of the ULB benefit from an enabling environment that is uniquely hybrid, between sciences and engineering, within a pluridisciplinary university in the heart of the capital of Europe and close to the European institutions. The combination of teachings from the Faculty of Sciences and the Polytechnics School of Brussels gives students a headstart toward the renowned versatility of this degree.

Over the course of the year students:

- > experience team work to carry out projects with the help and advice of a tutor;
- > get help from lecturers and teaching assistants and guidance from a special support unit specialized in a particular area.

Students will be able to make use of:

- > a specific and practical laboratory for most subjects;
- > the different department libraries;
- > the central university libraries and, in particular, the library of sciences and techniques
- > computer rooms.

## Programme objectives

Bioengineers are engineers of living matter and the environment. They are important in today's society to formulate and solve problems related to sustainable development, natural resources, climate change, GMOs, food security and the ethical questions all these problems raise. Bioengineers possess a large action radius in these matters.

The pluridisciplinarity of bioengineering studies allows students to develop the necessary creativity and all-roundness to operate with ease in a wide variety of engineering professions – creation, conception, production, optimization – as well as in biological, agronomical and environmental research.

## Programme's added value

At the ULB, the Interfaculty School of Bioengineering depends on both the Faculty of Sciences and the Polytechnics School of Brussels. This hybrid status guarantees a multidisciplinary

## Teaching methods

From the first year on, the study program alternates between different teaching methods (from ex cathedra theoretical teaching to project development). About half of the study credits are acquired through projects, exercises, personal assignments and laboratory work and the other half consist of theory. Excursions are organized as well.



## Succeed in your studies

### Choose

The information and guidance counsellors at the InfOR-études [<https://www.ulb.be/en/studies-info-desk-1>] service will help you choose your studies throughout the year.

### Succeed

Take part in preparatory courses [<https://www.ulb.be/en/studies-info-desk-1>] or get help to succeed [<https://www.ulb.be/en/studies-info-desk-1>], before or during your studies.

### Get help

Apply for financial aid, look for accommodation or a student job, get support [<https://www.ulb.be/fr/aides-services-et-accompagnement/aid-services-and-support-1>] for your specific needs.

## International/Openness

A period of study in foreign country with a programme adapted to each individual profile is organized during the Master.

The principle of this study programme abroad is to attend the courses abroad that are more or less identical to those not attended at the home university during the intended period. Since this exchange programme is reciprocal, foreign students are entitled to attend our courses as well. These exchanges are extremely beneficial for all involved students.

All teaching is organized by and at the ULB

## Job opportunities

The Bachelor of Bioengineering gives access to three distinct Masters in Bioengineering: agronomy, chemistry and bio-industry, and environmental technologies. Each one of those Master's degrees gives access to a variety of economic sectors, such as:

- Industry-related: chemical, agro-food or pharmaceutical industries, biotechnologies, informatics

- Agronomy, agriculture and agroecology
- Environmental management
- Public sector and international organizations and NGOs (regional, national, European, international)
- Consultancy
- Development aid
- Research (universities, public and private)
- Teaching (secondary and higher education)

If students wish to reorient themselves to other Masters, the Bachelor of Bioengineering gives access to several alternatives.

If the student prolongs the Bachelor's degree in Bioengineering with a Master's degree in Bioengineering, (s)he will thrive in a variety of professions:

- Bio-industrial engineering (research and development, production, marketing,...)
- Environmental engineering (consultancy, administrations, research,...)
- Agricultural engineering, soil and water management (consultancy, administrations, research, development aid (NGOs, administrations, ...))

### Contacts

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☁ <https://bioing.ulb.be/>

### Jury Presidents

Cyril GUEYDAN (bloc 1) and Axel Coussement (bloc 2 & 3)

### Jury Secretaries

Christian HERMANS (bloc 1) and Cécile Thonar (bloc 2 & 3)



# Bachelor in Bioengineering

The teaching covers four areas

- > A general background in sciences: mathematics, chemistry, physics, biology (general, zoology and botany), informatics;
- > Engineering sciences: transport phenomena, applied thermodynamics, electricity and electronics, chemical engineering, modeling;
- > Bioengineering sciences: agronomy, biochemistry and molecular biology, earth and soil science, environmental technologies
- > Humanities, in particular languages and an optional course in epistemology and business economics

The courses are taught ex cathedra and through the implementation of concrete projects. About half of the teaching volume consists of projects, exercises and laboratory work. The other half consists of theoretical teaching. Excursions are organized as well.

## Bloc 1 | BA-IRBI

### Cours obligatoires

BING-F1001	<b>Sciences de la terre et du bioingénieur, environnement et société</b>   Pierre REGNIER (Coordinator), Jean-Michel DECROLY, Christian HERMANS, Frank PATTYN and Alizée Roobaert 5 credits [lecture: 48h, seminars: 12h]  first term  French
BIOL-F105	<b>Biologie générale</b>   Martine VERCAUTEREN (Coordinator), Mélanie BOECKSTAENS, Cyril GUEYDAN, Véronique KRUYIS and Karine VAN DONINCK 10 credits [lecture: 94h, tutorial classes: 6h, practical work: 20h]  first and second terms  French
CHIM-F101	<b>Chimie générale</b>   Thierry VISART DE BOCARME (Coordinator), François RENIERS and Laurence RONGY 15 credits [lecture: 84h, tutorial classes: 48h, practical work: 52h, project: 40h]  first and second terms  French
CHIM-F102	<b>Chimie organique 1</b>   Cécile MOUCHERON (Coordinator) 5 credits [lecture: 30h, tutorial classes: 18h]  second term  French
MATH-F115	<b>Compléments d'analyse et algèbre linéaire</b>   Joel FINE (Coordinator) and Michele D'ADDARIO 5 credits [lecture: 30h, tutorial classes: 24h]  second term  French
MATH-F118	<b>Mathématiques</b> 10 credits [lecture: 60h, tutorial classes: 60h]  academic year  French
PHYS-H101	<b>Connaissances fondamentales et éléments de physique</b>   Yves LOUIS (Coordinator) and Marc HAELTERMAN 10 credits [lecture: 68h, tutorial classes: 40h, practical work: 12h]  first and second terms  French

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## Bloc 2 | BA-IRBI

### Cours obligatoires

BING-F202	<b>Agriculture et agroécologie</b>   Marjolein VISSER (Coordinator) ⌚ 5 credits [lecture: 36h, tutorial classes: 12h] 📅 second term 🗨 French
BIOL-F201	<b>Evolution et diversité des eucaryotes : botanique</b>   Pierre Jacques MEERTS (Coordinator) and Jason VLEMINCKX ⌚ 5 credits [lecture: 48h, practical work: 12h] 📅 first and second terms 🗨 French
BIOL-F202	<b>Evolution et diversité des eucaryotes : métazoaires</b>   Jean-François FLOT (Coordinator) and Jean-Christophe DE BISEAU D'HAUTEVILLE ⌚ 5 credits [lecture: 60h] 📅 second term 🗨 French
BIOL-F208	<b>Biochimie et physiologie de la cellule</b>   Vincent RAUSSENS (Coordinator), Véronique KRUYIS and Maud MARTIN ⌚ 5 credits [lecture: 60h] 📅 first term 🗨 French
BIOL-F209	<b>Travaux pratiques de botanique et zoologie</b>   Jean-Christophe DE BISEAU D'HAUTEVILLE (Coordinator), Jean-François FLOT, Pierre Jacques MEERTS and Jason VLEMINCKX ⌚ 5 credits [practical work: 60h] 📅 second term 🗨 French
CHIM-F201	<b>Chimie analytique 1</b>   Thomas DONEUX (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 36h, project: 12h] 📅 first term 🗨 French
ELEC-H201	<b>Electricité et électronique</b>   Frédéric ROBERT (Coordinator) and Johan GYSELINCK ⌚ 5 credits [lecture: 24h, tutorial classes: 12h, practical work: 24h] 📅 second term 🗨 French
GEOL-F2001	<b>Introduction à la minéralogie et à la pédologie</b>   Steeve BONNEVILLE (Coordinator) and Thomas DROUET DE LA THIBAUDERIE ⌚ 5 credits [lecture: 28h, practical work: 12h, field trips: 12h] 📅 first term 🗨 French
INFO-F206	<b>Informatique</b>   Olivier MARKOWITCH (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h, project: 12h] 📅 first term 🗨 French
LANG-F201	<b>Anglais scientifique I</b>   Alexander CORNFORD (Coordinator) ⌚ 5 credits [tutorial classes: 48h] 📅 second term 🗨 English
MATH-F215	<b>Mécanique</b>   Mélanie BERTELSON (Coordinator) ⌚ 5 credits [lecture: 30h, tutorial classes: 30h] 📅 second term 🗨 French
MECA-H301	<b>Systèmes énergétiques : principes de bases et technologies durables</b>   Axel Coussement (Coordinator) and Alessandro PARENTE ⌚ 5 credits [lecture: 30h, tutorial classes: 14h, practical work: 16h] 📅 first term 🗨 French

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## Bloc 3 | BA-IRBI

### Cours obligatoires

BING-F3004	<b>Anglais scientifique et épistémologie des sciences</b>   Céline KERMISCH (Coordinator) and Alexander CORNFORD ⌚ 5 credits [lecture: 48h] 📅 first and second terms 🗨 French
BING-F301	<b>Microbiologie générale et environnementale</b>   Isabelle GEORGE (Coordinator), Sigrid FLAHAUT and Cécile Thonar ⌚ 5 credits [lecture: 36h, practical work: 24h] 📅 second term 🗨 French
BING-F406	<b>Gestion de projet et projet de recherche</b>   Dimitri GILIS (Coordinator), Nathalie GYPENS, Christian HERMANS and Patrick SIMON ⌚ 5 credits [lecture: 24h, project: 36h] 📅 academic year 🗨 French
BIOL-F301	<b>Physiologie et développement des plantes</b>   Nathalie VERBRUGGEN (Coordinator) ⌚ 5 credits [lecture: 36h, practical work: 24h] 📅 first and second terms 🗨 French
BIOL-F309	<b>Ecologie</b>   Isabelle GEORGE (Coordinator), Pierre Jacques MEERTS and Jason VLEMINCKX ⌚ 5 credits [lecture: 30h, practical work: 30h] 📅 first term 🗨 French
BIOL-F323	<b>Génétique: aspects fondamentaux et appliqués</b>   Bruno ANDRE (Coordinator) and Benoît VANHOLLEBEKE ⌚ 5 credits [lecture: 42h] 📅 academic year 🗨 French
CHIM-H302	<b>Pollution du milieu physique</b>   Michel VERBANCK (Coordinator) and Gilles BRUYLANTS ⌚ 5 credits [lecture: 40h, tutorial classes: 8h, practical work: 12h] 📅 second term 🗨 French
CHIM-H314	<b>Introduction au génie des procédés</b>   Benoît HAUT (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h, practical work: 12h] 📅 second term 🗨 French
MATH-F316	<b>Biogéostatistiques</b>   Thomas VERDEBOUT (Coordinator) ⌚ 5 credits [lecture: 30h, tutorial classes: 24h] 📅 second term 🗨 French
MATH-H302	<b>Introduction à l'analyse complexe et au calcul numérique</b>   Artem NAPOV (Coordinator) and Michel KINNAERT ⌚ 5 credits [lecture: 24h, tutorial classes: 30h] 📅 first term 🗨 French
MECA-H3001	<b>Fluid mechanics and transfer processes</b>   Alessandro PARENTE (Coordinator) and Frédéric DEBASTE ⌚ 5 credits [lecture: 30h, tutorial classes: 24h] 📅 first term 🗨 English

*A total of five credits chosen from the following*

BING-F306 (optional)	<b>Travaux pratiques en Biochimie et Biologie Moléculaire</b>   Guillaume OLDENHOVE (Coordinator) and David PEREZ-MORGA ⌚ 5 credits [practical work: 48h] 📅 second term 🗨 French
ENVI-F454 (optional)	<b>Energie: Société et environnement</b>   Michel HUART (Coordinator) and Nadine MATTIELLI ⌚ 5 credits [lecture: 30h, practical work: 12h, project: 24h] 📅 first term 🗨 French
ETHI-F201 (optional)	<b>Sciences, éthique, histoire et société</b>   Grégoire Wallenborn (Coordinator) and Eric MURAILLE ⌚ 5 credits [lecture: 48h] 📅 second term 🗨 French
ETHI-F301 (optional)	<b>Science et Société : analyse de controverses scientifiques</b>   Patrick MARDULYN (Coordinator) and Grégoire Wallenborn ⌚ 5 credits [lecture: 24h, project: 70h] 📅 first term 🗨 French
PHYS-F317 (optional)	<b>How To Make (almost) Any Experiment Using Digital Fabrication</b>   Denis TERWAGNE (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 first term 🗨 French

TRAN-F201  
(optional)

**Introduction aux enjeux de la durabilité** | Wouter ACHTEN (Coordinator) and Chiara ARMENI

🕒 5 credits [lecture: 24h, project: 24h] 📅 second term 🗣️ French

