UCLouvain

BIR1BA

2019 - 2020

Bachelor in Bioengineering

At Louvain-la-Neuve - 180 credits - 3 years - Day schedule - In french
Dissertation/Graduation Project : **NO** - Internship : **YES**
Activities in English: **NO** - Activities in other languages : **NO**
Activities on other sites : **NO**
Main study domain : **Sciences agronomiques et ingénierie biologique**
Organized by: **Faculté des bioingénieurs (AGRO)**
Programme acronym: **bir1ba** - Francophone Certification Framework: 6

Table of contents

BIR1BA - Introduction

Introduction

Introduction

Au terme du premier cycle, vous

- aurez reçu une solide formation scientifique qui contribuera à faire de vous un professionnel capable de s'adapter à toutes les situations ;
- aurez entamé la formation spécialisée qui sera poursuivie au cours du master ;
- vous serez exercé-e à la résolution de problèmes de plus en plus complexes, seul ou en équipe ;
- aurez pris contact avec le milieu professionnel pour aiguiser votre motivation et vous aider à choisir votre parcours de spécialisation en master.

Your Profile

Pour aborder les études de bioingénieur, il faut avoir certains goûts : celui des sciences, sans doute, mais aussi celui de se poser des questions. Il faut aimer réfléchir et raisonner, avoir envie de résoudre des problèmes.

Pourvu que vous soyez assidu-e et motivé-e, le nombre d'heures de mathématiques ou de sciences que vous avez suivies dans le secondaire ne sera pas le seul facteur de votre réussite. Une bonne maîtrise du français vous aidera à saisir les nuances de l'énoncé d'un problème ou à mieux comprendre le développement d'une théorie.

Your Future Job

Une fois bachelier, vous poursuivrez votre formation par un Master en bioingénieur. Quatre masters vous sont proposés : « sciences agronomiques », « chimie et bioindustries », « sciences et technologies de l'environnement » et « gestion des forêts et des espaces naturels ».

Ces masters, qui se déroulent sur deux ans, vous permettront d'acquérir des savoirs approfondis dans une spécialisation de votre choix ainsi que la maîtrise d'outils professionnels en lien avec la discipline, tout en bénéficiant d'une formation polyvalente dans tous les domaines de la bioingéniérie.

Your Programme

Le programme de bachelier vous formera aux disciplines de base des sciences du vivant ainsi qu'aux techniques de l'ingénieur. Elles constitueront les piliers indispensables à la formation intégrée de bioingénieur.

Ces disciplines relèvent de cinq domaines principaux qui sont approfondis au cours des trois années :

- mathématiques, analyse et traitement de données,
- sciences et ingénierie de la matière et des procédés,
- sciences de la vie,
- sciences du globe et des écosystèmes,
- sciences humaines.

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 above. 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 search for information on a defined and simplified scientific problem, to assess its reliability based on the nature of the source of the information and to produce a summary.

3.2 To identify the causal relations between the key elements of a single scientific problem.

3.3 To implement a rigorous methodology (experimentation – observation – modelling) allowing the acquisition of data to answer a clearly defined scientific question.

3.4 To master the basics of statistical analysis of scientific data.

3.5 To analyse and interpret the results to produce a reasoned critique on a well-defined scientific question.

3.6 To demonstrate an ability to summarise and formulate conclusions on a well-defined scientific question.

3.7 In each of the skills mentioned above, to demonstrate rigour, precision and the critical thinking essential for any scientific method.

4. To formulate and analyse a simple problem in the agricultural, biological, chemical and environmental engineering fields linked with new situations presenting a degree of uncertainty. To be able to develop pertinent, sustainable and innovative solutions through a systematic and multidisciplinary approach.

This skill set will develop throughout the 5 years. It requires the use of a set of skills as described above. These skills correspond in fact to the different stages of the engineering approach. The majority of these skills are developed in the Bachelor and Master programmes, with differentiation on:

- the complexity and scope of the problem addressed;

- the degree of autonomy demonstrated by the student throughout the process;

- the degree of depth in each skill.

4.1 To extract relevant information to formalise a simple problem, with a view to defining one or more clear questions.

4.2 To identify the key concepts required to resolve the simple problem based on the knowledge acquired.

4.3 To analyse and resolve the simple problem using key concepts and to formulate hypotheses underlying the concepts.

4.5 To identify solutions and the limits of their application based on hypotheses formulated during the resolution stage.

5. To design and implement a multidisciplinary project, alone and in teams with the stakeholders concerned. This project should take the objectives into account and incorporate scientific, technical, environmental, economic and human factors.

The graduate should be able to lead a project alone and in a group, focusing on projects of a scientific and technological nature with highly targeted objectives.

5.1 To know and understand the principles of collaborative learning.

5.2 To plan and develop all the stages of a project alone and in a team based on predefined objectives and work together after having allocated the tasks.

5.3 To contribute to the progress of the project and the success of the team in sharing information and expertise in order to achieve the intended objective.

5.4 To recognise and take into account the diverse viewpoints of team members.

6. To communicate, interact and convince in a professional manner, in French and English (level B2 of the Common European Framework of Reference for Languages published by the Council of Europe), both verbally and in writing, adapting to their conversational partners and the context.

6.1 To understand and use scientific texts and literature and basic technical documents in French and English.

6.2 To communicate information, ideas, solutions and conclusions as well as the knowledge and underlying principles, in a clearly structured, substantiated, concise and comprehensive way (as appropriate) both verbally and in writing according to the standards of communication specific to the context.

6.3 To develop logic diagrams to pose simple questions in summary form.

6.4 To produce graphs, with and without IT equipment, meeting scientific standards.

6.5 To communicate the results of observations and/or experiences in a relevant way using tables and scientific graphs.

6.6 To communicate effectively and respectfully with peers and teachers, demonstrating listening skills, empathy and assertiveness.

6.7 To conduct themselves professional environments with the correct attitude, to interact with players in the field, with colleagues.

6.8 To explain and argue their opinions and views with peers and teachers.

6.9 To learn to use basic software for effective communication in the training activities.

6.10 To learn English to level B2 according to the European Framework.

7. To act with concern for sustainable development challenges, be open to the world and adopt a humanistic outlook.

7.1 To demonstrate intellectual independence of thought, to regard knowledge critically.

7.2 To make decisions and act, on their training path, with respect for ethical values and in compliance with laws and conventions.

7.3 To understand the key issues of sustainable development and to situate their own career in the light of these challenges.

7.4 To demonstrate humanism, cultural openness and solidarity.

8. To demonstrate independence and be proactive in acquiring new knowledge and the development of new skills to be able to adapt to changing or uncertain situations and to develop positively. They will develop a professional project and the course encompasses continuing development.

8.1 To adapt to a variety of learning situations and to take advantage of them.

8.2 To manage their education and work independently: to set priorities, anticipate and plan all their activities in time.

8.3 To manage stress and frustration in the face of undefined or urgent situations.

8.4 To take control of their educational career with the aim of defining the direction of their professional project.

8.5 To integrate new knowledge and skills independently (including methodological skills) in response to defined situations.

Programme structure

This programme which leads to the title of "Bachelor of Engineering Sciences : Bioengineering", is composed of three years of studies. The training programme comprises different types of course activities : lectures, practical exercises, group work, individual work, tutorials, work experience and, of course, personal study.

Each course title is followed by a number indicating the number of hours the course represents per academic year. This number corresponds to lectures, unless a different teaching method (seminars, exercises) is mentioned in the course title. Where course activities (exercises, laboratory work or practical tasks) accompany one or several lectures, these are characterised by a second volume of hours per year. The course timetable is available at the secretary's office of the Faculty.

The number in brackets next to the number of course hours, relates to the total number of credits attributed to the course activity. This unit is a measure of the student's global workload for one year of studies and corresponds to the unit used by the European Credit Transfer System (ECTS). A full study year includes 60 credits. The sign (~) refers to the description of the training activity, available on the web site, when the credits differ for the study years or for the options of the same programme.

Information on credits not indicated on the study programme can be obtained from the secretary's office of the Faculty.

Principal Subjects

- Mathematics, analysis and data-processing
- Sciences and Engineering of Matter and Processes
- Life Sciences
- Earth Sciences and Ecosystems
- Human Sciences

BIR1BA Detailled programme

Programme by subject

Major (148 credits)

Mathematics, data analysis (27 credits)

					Year 1	2	3
LBIR1110	Introduction to analysis	Emmanuel Hanert	30h+30h	6 Credits	1q	x		
LBIR1111	Complément d'analyse et d'algèbre	Marino Gran	30h+30h	6 Credits	2q	x		
LBIR1212	Probabilities and statistics (I)	Patrick Bogaert	30h+15h	4 Credits	1q		x	
LBIR1211	Analysis of multivariate functions	Emmanuel Hanert	30h+30h	5 Credits	1q		x	
LBIR1315	Probability and statistics II	Patrick Bogaert	22.5h +22.5h	3 Credits	1q			x
LBIR1351	Introduction to systems analysis	Philippe Baret	10h+20h	3 Credits	1q			x

Sciences et ingénierie de la matière et des procédés (46 credits)

LBIR1140	Chimie générale 1	Pierre Delmelle (coord.) Charles-André Fustin	30h+30h	6 Credits	1q	x		
LCHM1141B	Organic chemistry	Benjamin Elias (coord.) Charles-André Fustin	30h+30h	6 Credits	2q	x		
LBIR1121	General Mechanics	Eric Deleersnijder	30h+30h	6 Credits	1q	x		
LBIR1122	Thermodynamique et électromagnétisme	Sébastien Lambot	30h+30h	6 Credits	2q	x		
LBIR1221	Wave, optical and modern physics	Bruno Bertrand	30h+30h	5 Credits	2q		x	
LCHM1211A	Chimie générale 2	Michel Devillers Geoffroy Hautier	30h+30h	5 Credits	2q		x	
LCHM1241C	Organic chemistry 2	Olivier Riant	30h +22.5h	4 Credits	1q		x	

						Year 1	2	3
LBIR1325A	Transfert de fluides et d'énergie pour les bioingénieurs: partim A	Yann Bartosiewicz Mathieu Javaux Marnik Vanclooster	37.5h +22.5h	5 Credits	1q			x
LBIR1349	Chimie analytique I	Christine Dupont (coord.) Yann Garcia	30h+15h	3 Credits	1q			x

Life Sciences (29 credits)

LBIR1150	Cell Biology	Patrick Dumont Charles Hachez (coord.)	30h+15h	5 Credits	1q	x		
LBIR1151	Biologie de l'organisme	Guillaume Lobet Jean-François Rees (coord.)	30h+30h	6 Credits	2q	x		
LBIR1250	Biochemistry I	Michel Ghislain Yvan Larondelle (coord.)	30h+15h	4 Credits	1q		x	
LBIR1251	Biologie et Physiologie végétale	Xavier Draye (coord.) Stanley Lutts	30h+30h	5 Credits	2q		x	
LBIR1252	Physiologie animale	Cathy Debier (coord.) Isabelle Donnay	30h+30h	5 Credits	2q		x	
LBIR1350	General Microbiology	Jacques Mahillon	37.5h +15h	4 Credits	2q			x

Sciences du globe et des écosystèmes (11 credits)

LBIR1130	Introduction to Earth sciences	Pierre Delmelle (coord.) Sophie Opfergelt	30h+30h	6 Credits	2q	x		
LBIR1230	Introduction to biosphere engineering	Philippe Baret (coord.) Pierre Defourny Pierre Delmelle	60h	5 Credits	2q		x	

Human Sciences (20 credits)

LANGL1881	English : reading and listening comprehension of texts in Bioengineering	Amandine Dumont Ariane Halleux Sandrine Meirlaen (coord.) Anne-Julie Toubeau (coord.)	30h	2 Credits	1q	x		
LANGL1882	English : reading and listening comprehension of texts in Bioengineering	Amandine Dumont Ariane Halleux Sandrine Meirlaen (coord.) Lucille Meyers Charlotte Peters Anne-Julie Toubeau (coord.)	30h	2 Credits	2q		x	
LBIR1260	Principles of Economy	Goedele Van den Broeck	30h+15h	4 Credits	1q		x	
LANGL2480	English Communication Skills for Bioengineers	Ahmed Adrioueche Dominique François Sandrine Meirlaen Charlotte Peters Adrien Pham (coord.) Anne-Julie Toubeau	30h	2 Credits	2q			x
LBIR1360	Firm management and organisation		30h+7.5h	3 Credits	1q			x
LBIR1361	Report on the work experience training	David Alsteens Charles Bielders Cathy Debier Stephan Declerck Eric Gaigneaux (coord.)	60h	5 Credits				x
LSC1120A	Philosophy	Alexandre Guay	30h	2 Credits	1q		x	

Projects and Soft skills (15 credits)

LBIR1170	Projet appliqué en Chimie	Christine Dupont (coord.) Michel Ghislain	30h+60h	5 Credits	2q	x		

						Year 1	2	3
LBIR1270	Projet intégré en diagnostic environnemental	Yannick Agnan Anne-Laure Jacquemart (coord.)	30h+30h	5 Credits	1q		x	
LBIR1271	Projet intégré en informatique et mathématiques appliquées	Patrick Bogaert Emmanuel Hanert (coord.) Marnik Vanclooster	30h+30h	5 Credits	2q		x	

Choice of an option (32 credits)

Agronomy

LBIR1353	Biologie intégrative	Guillaume Lobet Stanley Lutts (coord.) Muriel Quinet	22.5h +15h	3 Credits	1q			x
LBIR1354	Biologie des interactions	Anne-Laure Jacquemart (coord.) Anne Legrève	22.5h +15h	3 Credits	2q			x
LBIR1355	Métabolisme microbien et synthèse de biomolécules	Michel Ghislain (coord.) Yvan Larondelle	22.5h +15h	3 Credits	2q			x
LBIR1362	Environmental Economics	Frédéric Gaspart	30h+7.5h	3 Credits	2q			x
LBIR1336B	Sciences du sol et excursions intégrées - partim B	Yannick Agnan Richard Lambert Caroline Vincke	22.5h +30h	4 Credits	2q			x
LBIR1352B	Génétique générale: partim B	Philippe Baret	30h+15h	4 Credits	2q			x
LBIR1328A	Climatology and hydrology applied to agronomy and the environment - partim 1	Charles Bielders Hugues Goosse Marnik Vanclooster	22.5h	2 Credits	1q			x
	Activités au choix libre *The students have a free choice of courses of 10 credits.It's advisable to choose 3 credits within the other options in order to reach 32 credits of the option.*			Credits				x

Chemistry

LBIR1355	Métabolisme microbien et synthèse de biomolécules	Michel Ghislain (coord.) Yvan Larondelle	22.5h +15h	3 Credits	2q			x
LBIR1340	Fondements de mécanique quantique et de spectroscopie	Eric Gaigneaux (coord.) Xavier Gonze	22.5h +22.5h	3 Credits	2q			x
LBIR1342	Analyse de composés organiques dans des matrices complexes	Sonia Collin	30h+45h	5 Credits	2q			x
LBIR1346	Surface and colloid chemistry	Christine Dupont	30h	3 Credits	2q			x
LBIR1341	Laboratories, seminars and integrated practice of analytical chemistry	Christine Dupont	30h+45h	5 Credits	1q			x

One course to be chosen amongst the follwong two:

En fonction de l'activité choisie, l'étudiant·e prend 10 ou 11 crédits d'activité au choix libre.

LBIR1352A	Génétique générale - partim A	Philippe Baret	30h+7.5h	3 Credits	2q			x
LBIR1325B	Transferts de fluide et d'énergie pour les bioingénieurs (partim B): Case studies	Yann Bartosiewicz Mathieu Javaux Marnik Vanclooster	0h+30h	2 Credits	2q			x
	Activités au choix libre *The students have a free choice of courses of 10 credits.It's advisable to choose 3 credits within the other options in order to reach 32 credits of the option.*			Credits				x

Environment

LBIR1328	Climatology and hydrology applied to agronomy and the environment	Charles Bielders Hugues Goosse Marnik Vanclooster (coord.)	45h +22.5h	6 Credits	1q			x
LBIR1362	Environmental Economics	Frédéric Gaspart	30h+7.5h	3 Credits	2q			x
LBIR1336	Sciences du sol et excursions intégrées	Yannick Agnan (coord.) Richard Lambert Caroline Vincke	30h +37.5h	5 Credits	2q			x
LBIR1334	Introduction to forestry sciences	Quentin Ponette (coord.) Caroline Vincke	22.5h +15h	3 Credits	2q			x

						Year 1	2	3
LBIR1354	Biologie des interactions	Anne-Laure Jacquemart (coord.) Anne Legrève	22.5h +15h	3 Credits	2q			x
LBIR1325B	Transferts de fluide et d'énergie pour les bioingénieurs (partim B): Case studies	Yann Bartosiewicz Mathieu Javaux Marnik Vanclooster	0h+30h	2 Credits	2q			x
	Activités au choix libre *The students have a free choice of courses of 10 credits.It's advisable to choose 3 credits within the other options in order to reach 32 credits of the option.*			Credits				x

Course prerequisites

A document entitled en-prerequis-2019-bir1ba.pdf specifies the activities (course units - CU) with one or more pre-requisite(s) within the study programme, that is the CU whose learning outcomes must have been certified and for which the credits must have been granted by the jury before the student is authorised to sign up for that activity.

These activities are identified in the study programme: their title is followed by a yellow square.

As the prerequisites are a requirement of enrolment, there are none within a year of a course.

The prerequisites are defined for the CUs for different years and therefore influence the order in which the student can enrol in the programme's CUs.
In addition, when the panel validates a student's individual programme at the beginning of the year, it ensures the consistency of the individual programme:

- It can change a prerequisite into a corequisite within a single year (to allow studies to be continued with an adequate annual load);
- It can require the student to combine enrolment in two separate CUs it considers necessary for educational purposes.

For more information, please consult regulation of studies and exams.

The programme's courses and learning outcomes

For each UCLouvain training programme, a reference framework of learning outcomes specifies the competences expected of every graduate on completion of the programme. You can see the contribution of each teaching unit to the programme's reference framework of learning outcomes in the document *"In which teaching units are the competences and learning outcomes in the programme's reference framework developed and mastered by the student?"*

The document is available by clicking this link after being authenticated with UCL account.

Programme type

BIR1BA - 1ST ANNUAL UNIT

O Mandatory	⊠ Optional
△ Courses not taught during 2019-2020	⊘ Periodic courses not taught during 2019-2020
⊕ Periodic courses taught during 2019-2020	Activity with requisites

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

O *Major*

O Mathematics, data analysis

O LBIR1110	Introduction to analysis	Emmanuel Hanert	30h+30h	6 Credits	1q
O LBIR1111	Complément d'analyse et d'algèbre	Marino Gran	30h+30h	6 Credits	2q

O Sciences et ingénierie de la matière et des procédés

O LBIR1140	Chimie générale 1	Pierre Delmelle (coord.) Charles-André Fustin	30h+30h	6 Credits	1q
O LCHM1141B	Organic chemistry	Benjamin Elias (coord.) Charles-André Fustin	30h+30h	6 Credits	2q
O LBIR1121	General Mechanics	Eric Deleersnijder	30h+30h	6 Credits	1q
O LBIR1122	Thermodynamique et électromagnétisme	Sébastien Lambot	30h+30h	6 Credits	2q

O Life Sciences

O LBIR1150	Cell Biology	Patrick Dumont Charles Hachez (coord.)	30h+15h	5 Credits	1q
O LBIR1151	Biologie de l'organisme	Guillaume Lobet Jean-François Rees (coord.)	30h+30h	6 Credits	2q

Sciences du globe et des écosystèmes

LBIR1130	Introduction to Earth sciences	Pierre Delmelle (coord.) Sophie Opfergelt	30h+30h	6 Credits	2q

Human Sciences

LANGL1881	English : reading and listening comprehension of texts in Bioengineering	Amandine Dumont Ariane Halleux Sandrine Meirlaen (coord.) Anne-Julie Toubeau (coord.)	30h	2 Credits	1q

Projects and Soft skills

LBIR1170	Projet appliqué en Chimie	Christine Dupont (coord.) Michel Ghislain	30h+60h	5 Credits	2q

BIR1BA - 2ND ANNUAL UNIT

O Mandatory	⊠ Optional
△ Courses not taught during 2019-2020	⊘ Periodic courses not taught during 2019-2020
⊕ Periodic courses taught during 2019-2020	Activity with requisites

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

O Major

O Mathematics, data analysis

O LBIR1212	Probabilities and statistics (I)	Patrick Bogaert	30h+15h	4 Credits	1q
O LBIR1211	Analysis of multivariate functions	Emmanuel Hanert	30h+30h	5 Credits	1q

O Sciences et ingénierie de la matière et des procédés

O LBIR1221	Wave, optical and modern physics	Bruno Bertrand	30h+30h	5 Credits	2q
O LCHM1211A	Chimie générale 2	Michel Devillers Geoffroy Hautier	30h+30h	5 Credits	2q
O LCHM1241C	Organic chemistry 2	Olivier Riant	30h +22.5h	4 Credits	1q

O Life Sciences

O LBIR1250	Biochemistry I	Michel Ghislain Yvan Larondelle (coord.)	30h+15h	4 Credits	1q
O LBIR1251	Biologie et Physiologie végétale	Xavier Draye (coord.) Stanley Lutts	30h+30h	5 Credits	2q
O LBIR1252	Physiologie animale	Cathy Debier (coord.) Isabelle Donnay	30h+30h	5 Credits	2q

O Sciences du globe et des écosystèmes

O LBIR1230	Introduction to biosphere engineering	Philippe Baret (coord.) Pierre Defourny Pierre Delmelle	60h	5 Credits	2q

O Human Sciences

O LANGL1882	English : reading and listening comprehension of texts in Bioengineering	Amandine Dumont Ariane Halleux Sandrine Meirlaen (coord.) Lucille Meyers Charlotte Peters Anne-Julie Toubeau (coord.)	30h	2 Credits	2q
O LBIR1260	Principles of Economy	Goedele Van den Broeck	30h+15h	4 Credits	1q
O LSC1120A	Philosophy	Alexandre Guay	30h	2 Credits	1q

O Projects and Soft skills

O LBIR1270	Projet intégré en diagnostic environnemental	Yannick Agnan Anne-Laure Jacquemart (coord.)	30h+30h	5 Credits	1q
O LBIR1271	Projet intégré en informatique et mathématiques appliquées	Patrick Bogaert Emmanuel Hanert (coord.) Marnik Vanclooster	30h+30h	5 Credits	2q

BIR1BA - 3RD ANNUAL UNIT

○ Mandatory	⊠ Optional
△ Courses not taught during 2019-2020	⊘ Periodic courses not taught during 2019-2020
⊕ Periodic courses taught during 2019-2020	Activity with requisites

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

○ Major

○ Mathematics, data analysis

○ LBIR1315	Probability and statistics II	Patrick Bogaert	22.5h +22.5h	3 Credits	1q
○ LBIR1351	Introduction to systems analysis	Philippe Baret	10h+20h	3 Credits	1q

○ Sciences et ingénierie de la matière et des procédés

○ LBIR1325A	Transfert de fluides et d'énergie pour les bioingénieurs: partim A	Yann Bartosiewicz Mathieu Javaux Marnik Vanclooster	37.5h +22.5h	5 Credits	1q
○ LBIR1349	Chimie analytique I	Christine Dupont (coord.) Yann Garcia	30h+15h	3 Credits	1q

○ Life Sciences

○ LBIR1350	General Microbiology	Jacques Mahillon	37.5h +15h	4 Credits	2q

○ Human Sciences

○ LANGL2480	English Communication Skills for Bioengineers	Ahmed Adrioueche Dominique François Sandrine Meirlaen Charlotte Peters Adrien Pham (coord.) Anne-Julie Toubeau	30h	2 Credits	2q
○ LBIR1360	Firm management and organisation		30h+7.5h	3 Credits	1q
○ LBIR1361	Report on the work experience training	David Alsteens Charles Bielders Cathy Debier Stephan Declerck Eric Gaigneaux (coord.)	60h	5 Credits	

○ Choice of an option

⊠ Agronomy

○ LBIR1353	Biologie intégrative	Guillaume Lobet Stanley Lutts (coord.) Muriel Quinet	22.5h +15h	3 Credits	1q
○ LBIR1354	Biologie des interactions	Anne-Laure Jacquemart (coord.) Anne Legrève	22.5h +15h	3 Credits	2q
○ LBIR1355	Métabolisme microbien et synthèse de biomolécules	Michel Ghislain (coord.) Yvan Larondelle	22.5h +15h	3 Credits	2q
○ LBIR1362	Environmental Economics	Frédéric Gaspart	30h+7.5h	3 Credits	2q
○ LBIR1336B	Sciences du sol et excursions intégrées - partim B	Yannick Agnan Richard Lambert Caroline Vincke	22.5h +30h	4 Credits	2q
○ LBIR1352B	Génétique générale: partim B	Philippe Baret	30h+15h	4 Credits	2q
○ LBIR1328A	Climatology and hydrology applied to agronomy and the environment - partim 1	Charles Bielders Hugues Goosse Marnik Vanclooster	22.5h	2 Credits	1q
○	Activités au choix libre *The students have a free choice of courses of 10 credits.It's advisable to choose 3 credits within the other options in order to reach 32 credits of the option.*			Credits	

⊠ Chemistry

LBIR1355	Métabolisme microbien et synthèse de biomolécules	Michel Ghislain (coord.) Yvan Larondelle	22.5h +15h	3 Credits	2q
LBIR1340	Fondements de mécanique quantique et de spectroscopie	Eric Gaigneaux (coord.) Xavier Gonze	22.5h +22.5h	3 Credits	2q
LBIR1342	Analyse de composés organiques dans des matrices complexes	Sonia Collin	30h+45h	5 Credits	2q
LBIR1346	Surface and colloid chemistry	Christine Dupont	30h	3 Credits	2q
LBIR1341	Laboratories, seminars and integrated practice of analytical chemistry	Christine Dupont	30h+45h	5 Credits	1q

One course to be chosen amongst the follwong two:
En fonction de l'activité choisie, l'étudiant·e prend 10 ou 11 crédits d'activité au choix libre.

LBIR1352A	Génétique générale - partim A	Philippe Baret	30h+7.5h	3 Credits	2q
LBIR1325B	Transferts de fluide et d'énergie pour les bioingénieurs (partim B): Case studies	Yann Bartosiewicz Mathieu Javaux Marnik Vanclooster	0h+30h	2 Credits	2q
	Activités au choix libre *The students have a free choice of courses of 10 credits.It's advisable to choose 3 credits within the other options in order to reach 32 credits of the option.*			Credits	

Environment

LBIR1328	Climatology and hydrology applied to agronomy and the environment	Charles Bielders Hugues Goosse Marnik Vanclooster (coord.)	45h +22.5h	6 Credits	1q
LBIR1362	Environmental Economics	Frédéric Gaspart	30h+7.5h	3 Credits	2q
LBIR1336	Sciences du sol et excursions intégrées	Yannick Agnan (coord.) Richard Lambert Caroline Vincke	30h +37.5h	5 Credits	2q
LBIR1334	Introduction to forestry sciences	Quentin Ponette (coord.) Caroline Vincke	22.5h +15h	3 Credits	2q
LBIR1354	Biologie des interactions	Anne-Laure Jacquemart (coord.) Anne Legrève	22.5h +15h	3 Credits	2q
LBIR1325B	Transferts de fluide et d'énergie pour les bioingénieurs (partim B): Case studies	Yann Bartosiewicz Mathieu Javaux Marnik Vanclooster	0h+30h	2 Credits	2q
	Activités au choix libre *The students have a free choice of courses of 10 credits.It's advisable to choose 3 credits within the other options in order to reach 32 credits of the option.*			Credits	

BIR1BA - Information

Teaching method

La structure générale de la formation (programmes de bachelier en Sciences de l'ingénieur, orientation bioingénieur, et de master bioingénieur) concrétise les concepts d'orientation, de choix progressifs et d'individualisation des *cursi* :

Dans le premier cycle (bachelier) :

- programme commun à SC et AGRO en 1ère année (BIR11BA),
- programme unique en 2ème année (BIR12BA) pour l'ensemble des étudiants BIR,
- programme différencié avec 30 crédits d'option en 3ème année (BIR**C**13BA, BIR**A**13BA, BIR**E**13BA) : ce programme différencié propose trois mineures d'approfondissement : chimie (BIRC), agronomie (BIRA), environnement (BIRE).

L'interdisciplinarité et l'approche intégrée sont des dimensions essentielles dans la formation des **bioingénieurs en sciences agronomiques**. Ces dimensions sont soutenues par :

- l'offre d'enseignements organisés par d'autres Facultés ;
- le regroupement d'activités de formation : exercices intégrés, projet intégré, analyses de situation réelles, mises en situation ;
- la perception, l'analyse, le diagnostic et la proposition de cahiers de charges (gestion, conception de nouveaux procédésâ€¦) intégrant divers types d'outils (observations de terrain, analyses de laboratoire, bases de données, biométrie, modélisation, simulationâ€¦) et diverses échelles d'espace (du moléculaire à la parcelle et à l'exploitation, de la région agricole au sous-continent, et au-delà) et de temps ;
- l'implication d'équipes d'enseignants de compétences variées et complémentaires ;
- la formation et la stimulation au travail en équipe d'étudiants intégrant le développement d'une véritable capacité autonome de travail intellectuel.

La formation générale comprend différents types de prestations : cours magistraux, exercices pratiques, travaux de groupe, travaux personnels, monitorats, stage et bien entendu, étude individuelle.

Chaque intitulé de cours est suivi d'un nombre qui indique le nombre d'heures de ce cours par année académique. Ce nombre correspond à des cours magistraux sauf si l'intitulé mentionne un autre mode d'enseignement (séminaires, exercices...). Lorsque des activités de formations (exercices, laboratoires, travaux pratiques...) accompagnent un ou plusieurs cours magistraux, elles sont caractérisées par un second volume horaire annuel. Une fiche descriptive de l'activité de formation est disponible sur le site web quand les crédits sont différents pour les années d'études ou les options d'un même programme.

L'horaire de cours est disponible au secrétariat de la Faculté et via le portail.

Evaluation

The evaluation methods comply with the regulations concerning studies and exams. More detailed explanation of the modalities specific to each learning unit are available on their description sheets under the heading "Learning outcomes evaluation method".

Différentes modalités sont mises en oeuvre pour l'évaluation des connaissances et des compétences acquises au cours de la formation; elles sont adaptées aux types de prestations : évaluation continue notamment pour les exercices pratiques, évaluation des travaux personnels et de groupe, évaluation globale (écrite et/ou orale) durant les sessions d'examens.

Mobility and/or Internationalisation outlook

Il n'y a pas de mobilité en tant que telle durant les 3 premières années de bachelier.

Cependant, l'étudiant peut réaliser son **stage de premier cycle** à l'étranger.

Il pourra aussi, si il souhaite, suivre un ou plusieurs cours équivalents à la KULeuven dans le cadre de l'accord existant entre les deux universités.

Possible trainings at the end of the programme

Positioning of the programme within the University curses

Successful completion of the1st year allows direct access not only to the second year in Bioengineering, but also to the second year of the bachelor's programmes in Biological, Chemical or Geographical Sciences.

Upon successful completion of his bachelor's studies, the student will be entitled access to three master's programmes, in the context of the second cycle of studies of the Faculty of Bioengineering, Agronomy and Environment :

Bioengineering : Agronomical Sciences, Bioengineering : Chemistry and Bio-industries Bioengineering : Sciences and Technologies of the Environment.

Other studies accessible upon completion of the programme

In addition, the student will also be able to access other master's programmes organised in other UCL faculties or in other universities in Belgium or abroad, subject to possible prerequisites specified for the programme in question.

Contacts

Curriculum Managment

Faculty

Structure entity	SST/AGRO
Denomination	Faculty of bioscience engineering (AGRO)
Sector	Sciences and Technology (SST)
Acronym	AGRO
Postal address	Croix du Sud 2 - bte L7.05.01 1348 Louvain-la-Neuve Tel: +32 (0)10 47 37 19 - Fax: +32 (0)10 47 47 45
Web site	http://www.uclouvain.be/agro

Mandate(s)

- Doyen : Philippe Baret
- Directeur administratif de faculté : Christine Denayer

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)

Academic supervisor: Mathieu Javaux

Jury

- Président de jury: Charles Bielders
- Secrétaire de jury BIR11BA: Anne Legrève
- Secrétaire de jury BIR13BA: Anne Legrève

Usefull Contact(s)

- Conseiller aux études: Eric Gaigneaux