

BIRC2M

2015 - 2016

Master [120] in Chemistry and Bioindustries

At Louvain-la-Neuve - 120 credits - 2 years - Day schedule - In frenchDissertation/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: **Faculté des bioingénieurs (AGRO)**Programme code: **birc2m** - Francophone Certification Framework: 7**Table of contents**

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BIRC2M - Introduction

Introduction

BIRC2M - Teaching profile

Learning outcomes

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Programme structure

This programme comprises a series of activities totalling 120 credits spread over two years worth 60 credits each.

The special nature of certain option courses (international programme for the option course in brewing and shared programme for the option course in Information Analysis and Management in Biological Engineering between the three Masters in Bioengineering) requires different approaches for the core subjects programme and the professional focus.

The programme is described according to three special subjects:

1. foundation special subject (applies to option course 1C, 2C, 3C and 4C),
2. Information Analysis and Management in Biological Engineering special subject (applies to option course 10C)
3. Brewing special subject (applies to option 12C).

Certain foundation special subject option courses are organized jointly with one or two of the other Masters in Bioengineering programmes. This is the reason for the special numbering of these option courses. (For example, option course 1C is also in the programme for the Master in Agronomic Science where it is called option course 1A.)

Year 1 :

core subjects programme :

1. Foundation special subject: 10 credits
2. Information Analysis and Management special subject: 15 credits
3. Brewing special subject : 11 credits

professional focus programme :

- 1 Foundation special subject : 30 credits
2. Information Analysis and Management special subject: 30 credits
3. Brewing special subject: 19 credits

choice of one option course from six available :

1. Foundation special subject: 20 credits
2. Information Analysis and Management special subject: 15 credits
3. Brewing special subject: 30 credits

Year 2 :

core subjects programme :

1. Foundation special subject: 50 credits
2. Information Analysis and Management special subject: 45 credits
3. Brewing special subject: 49 credits (dissertation + 19 credits for courses at the University of Lorraine)

professional focus programme :

1. Foundation special subject : 0 credits
2. Information Analysis and Management special subject: 0 credits
3. Brewing special subject: 11 credits (taken at the University of Lorraine)

choice of one option course from six available :

1. Foundation special subject : 10 credits
2. Information Analysis and Management special subject: 15 credits
3. Brewing special subject: 0 credits

Optional subjects :

There are some optional courses within the programme. They may either be chosen from a suggested list or may be chosen freely from all the courses available at UCL or even at another institution. The same applies to all the optional courses in the programme.

All these choices must be made in the timescale laid down by the Faculty Department and agreed by the Academic Secretary. For courses from another faculty or institution, students must gain prior agreement from the lecturer in charge of the course.

Additional training "Business Creation"

Students enrolled on the Master in Bioengineering programme have the possibility of taking a module of interdisciplinary training entitled "Business Creation". This additional programme features in the Master programmes of various faculties (Bioengineering, Law, Business Management, Civil Engineering, Psychology). It is designed to provide students, as potential creators, with the tools for analysis and understanding which will help them to appreciate how entrepreneurship works when creating or taking on a business and develop projects of this kind within existing organizations.

In addition, this training enables students to gain familiarity with other disciplines and to learn how to work in multidisciplinary teams.

For further information :

- on the training programme, please refer to : <https://www.uclouvain.be/cpme.html>
- on how the Master in Bioengineering programmes work, please contact the Faculty Office.

For a programme-type, and regardless of the focus, options/or elective courses selected, this master will carry a minimum of 120 credits divided over two annual units, corresponding to 60 credits each.

> [Tronc commun](#) [[en-prog-2015-birc2m-lbirc200t.html](#)]

> [Professional focus](#) [[en-prog-2015-birc2m-lbirc200s](#)]

Options courses

- > [Science, Technology and Food Quality \(Option 1C\)](#) [[en-prog-2015-birc2m-lbirc201o.html](#)]
- > [Biomolecular and Cellular Engineering \(Option 2C\)](#) [[en-prog-2015-birc2m-lbirc202o.html](#)]
- > [Nanobiotechnology, Materials and Catalysis \(Option 3C\)](#) [[en-prog-2015-birc2m-lbirc203o.html](#)]
- > [Environmental Technology, Water, Earth, Air \(Option 4C\)](#) [[en-prog-2015-birc2m-lbirc204o.html](#)]
- > [Information Analysis and Management in Biological Engineering \(Option 10C\)](#) [[en-prog-2015-birc2m-lbirc210o.html](#)]
- > [Business Creation \(Option 13C\)](#) [[en-prog-2015-birc2m-lbirc213o.html](#)]

BIRC2M Detailed programme

Programme by subject

CORE COURSES [60.0]

Cours au choix :

Au sein de ce programme, des cours sont proposés au choix. Ils sont à choisir au sein d'une liste ou peuvent faire l'objet d'un choix totalement libre dans le portefeuille de cours de l'UCL, voire d'une autre institution. Tous ces choix doivent être validés par le vice-doyen et/ou avoir reçu l'accord préalable du titulaire du cours, si le cours est emprunté dans une autre faculté ou institution.

● Mandatory

△ Courses not taught during 2015-2016

⊕ Periodic courses taught during 2015-2016

⊗ Optional

⊖ Periodic courses not taught during 2015-2016

■ Activity with requisites

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

Students taking the option "Information Analysis and Management in Biological Engineering" will enrol at the specific commun courses called "tronc commun" of that option.

Year

1 2

⊗ Programme for students choosing one of these options 1C, 2C, 3C, 4C and 13C (60 credits)

Students taking option 3C must add the course LBIRC2106 to their programme in the first year of their master's programme. Students choosing the option "entrepreneurship"(13C) will realise their master thesis within this specific programme.

● LBIRC2200	Master thesis ■	N.		27 Credits			x
● LBIRC2210	Master thesis' accompanying seminar	Marc Boutry, Sonia Collin, Stephan Declerck (coord.), Christine Dupont, Eric Gaigneaux, Patrick Gerin	30h	3 Credits	1 + 2q		x
● LBIRC2107	Bibliographical team project: chemistry and bio-industries	Stephan Declerck, Eric Gaigneaux, Patrick Gerin (coord.), Michel Ghislain	45h	4 Credits	1 + 2q		x
● LBIRC2109	Process engineering : unit operations	Damien Debecker	60h+15h	6 Credits	2q		x
● LBIRC2106	Chemometrics	Bernadette Govaerts	22.5h +15h	3 Credits	1q		x x

Year

						1	2
○ LMAPR2430	Industrial processes for the production of base chemicals 🟡	Juray De Wilde	30h +22.5h	5 Credits	1q	x	x

○ Traineeship or Courses to be chosen for 10 credits:

Students not doing the traineeship will take the Industrial project LBIRC2201 - 5 credits AND a free choice of courses for 5 credits.

⌘ LBIR2000	Masters Internship	N.		10 Credits	2q		x
⌘ LBIRC2201	Industrial project in chemical and biochemical engineering 🟡	Patrick Gerin	52.5h	5 Credits	1q		x
⌘	Free choice of courses for 5 credits.	N.		Credits			x

○ Ethics (2 credits)

The students will opt firstly for the course LTECO2300. Two other choices are also available.

⌘ LTECO2300	Questions of religious sciences: questions about ethics	Marcela Lobo Bustamante	15h	2 Credits	1q	x	x
⌘ LTECO2100	Questions of religious sciences: Biblical readings	Hans Ausloos	15h	2 Credits	1q	x	x
⌘ LTECO2200	Questions of religious sciences: reflections about Christian faith	Dominique Martens	15h	2 Credits	2q	x	x

⌘ Programme for students taking Option 10C - Information Analysis and Management in Biological Engineering (60 credits)

○ LBIRC2200	Master thesis 🟡	N.		27 Credits			x
○ LBIRC2210	Master thesis' accompanying seminar	Marc Boutry, Sonia Collin, Stephan Declerck (coord.), Christine Dupont, Eric Gaigneaux, Patrick Gerin	30h	3 Credits	1 + 2q		x
○ LBIRC2109	Process engineering : unit operations	Damien Debecker	60h+15h	6 Credits	2q		x
○ LBIRA2101	Biometry : analysis of the variance	Xavier Draye (coord.), Anouar El Ghouch, Bernadette Govaerts	30h+15h	4 Credits	1q		x
○ LBRMC2201	Bioinformatics : DNA and protein sequences	Michel Ghislain (coord.), Jacques Mahillon	30h+15h	4 Credits	1q		x
○ LBIRC2107	Bibliographical team project: chemistry and bio-industries	Stephan Declerck, Eric Gaigneaux, Patrick Gerin (coord.), Michel Ghislain	45h	4 Credits	1 + 2q		x

○ Traineeship or Courses to be chosen for 10 credits:

Students not doing the traineeship will take the Industrial project LBIRC2201 - 5 credits AND a free choice of courses for 5 credits.

⌘ LBIR2000	Masters Internship	N.		10 Credits	2q		x
⌘ LBIRC2201	Industrial project in chemical and biochemical engineering 🟡	Patrick Gerin	52.5h	5 Credits	1q		x
⌘	Free choice of courses for 5 credits.	N.		Credits			x

○ Ethics (2 credits)

The students will opt firstly for the course LTECO2300. Two other choices are also available.

⌘ LTECO2300	Questions of religious sciences: questions about ethics	Marcela Lobo Bustamante	15h	2 Credits	1q	x	x
⌘ LTECO2100	Questions of religious sciences: Biblical readings	Hans Ausloos	15h	2 Credits	1q	x	x
⌘ LTECO2200	Questions of religious sciences: reflections about Christian faith	Dominique Martens	15h	2 Credits	2q	x	x

PROFESSIONAL FOCUS [30.0]

● Mandatory

△ Courses not taught during 2015-2016

⊕ Periodic courses taught during 2015-2016

⊗ Optional

⊖ Periodic courses not taught during 2015-2016

■ Activity with requisites

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

						Year	
						1	2
● LBIRC2101	Biochemical analysis and genetic engineering	Marc Boutry (coord.), François Chaumont, Charles Hachez (compensates Marc Boutry), Pierre Morsomme	37.5h +45h	7 Credits	1q	x	
● LBIRC2102	Organic analysis II	Sonia Collin (coord.), Marie-France Herent, Raphaël Robiette	45h+30h	7 Credits	2q	x	
● LBIRC2104	Analytical chemistry II	Christine Dupont, Yann Garcia (coord.)	22.5h +30h	5 Credits	1q	x	
● LBIRC2108	Biochemical and Microbial Engineering	Benoît Stenuit	30h +22.5h	5 Credits	2q	x	
● LBIRC2105	Physical chemistry II	Damien Debecker	45h+15h	6 Credits	1q	x	

OPTIONS [30.0]

- > Science, Technology and Food Quality (Option 1C) [en-prog-2015-birc2m-lbirc201o]
- > Biomolecular and Cellular Engineering (Option 2C) [en-prog-2015-birc2m-lbirc202o]
- > Nanobiotechnology, Materials and Catalysis (Option 3C) [en-prog-2015-birc2m-lbirc203o]
- > Environmental Technology, Water, Earth, Air (Option 4C) [en-prog-2015-birc2m-lbirc204o]
- > Information Analysis and Management in Biological Engineering (Option 10C) [en-prog-2015-birc2m-lbirc210o]
- > Business Creation (Option 13C) [en-prog-2015-birc2m-lbirc213o]

SCIENCE, TECHNOLOGY AND FOOD QUALITY (OPTION 1C) [30.0]

● Mandatory

△ Courses not taught during 2015-2016

⊕ Periodic courses taught during 2015-2016

⊗ Optional

⊖ Periodic courses not taught during 2015-2016

■ Activity with requisites

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

Year

1 2

● LBRAL2103	Food chemistry	Sonia Collin	30h +22.5h	5 Credits	1q	x	
● LBRAL2104	Food microbiology	Jacques Mahillon	30h +22.5h	5 Credits	2q	x	
● LBRAL2201A	Food technology (partim)	Axel Kather	52.5h	5 Credits	2q	x	x

o Courses to be chosen for 15 credits minimum amongst the following list:

⊗ LBRAL2102	Physiological and nutritional biochemistry	Yvan Larondelle (coord.), Yves-Jacques Schneider	52.5h	5 Credits	1q	x	x
⊗ LBRAL2105	Brewing biochemistry	Pablo Alvarez Costales, Stephan Declerck (coord.), Catherine Liégeois	30h +22.5h	5 Credits	1q	x	x
⊗ LBRAL2106	Brewing biochemistry	Sonia Collin	30h +22.5h	5 Credits	1q	x	x
⊗ LBRAL2101	Beer organoleptic and microbiological quality ■	Sonia Collin (coord.), Marc Maudoux	30h +22.5h	5 Credits	2q	x	x
⊗ LBRTE2201	Human and environmental toxicology	Alfred Bernard, Cathy Debier (coord.)	45h+7.5h	5 Credits	1q	x	x

BIOMOLECULAR AND CELLULAR ENGINEERING (OPTION 2C) [30.0]

○ Mandatory

△ Courses not taught during 2015-2016

⊕ Periodic courses taught during 2015-2016

⊗ Optional

⊖ Periodic courses not taught during 2015-2016

■ Activity with requisites

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

Year

1 2

○ LBRMC2101	Genetic engineering ■	Marc Boutry, Charles Hachez (compensates Marc Boutry)	30h+7.5h	3 Credits	1q	x	
○ LBRMC2201	Bioinformatics : DNA and protein sequences	Michel Ghislain (coord.), Jacques Mahillon	30h+15h	4 Credits	1q	x	
○ LBRMC2202	Cell culture technology	Marc Boutry (coord.), Pascal Hols, Yves-Jacques Schneider	30h	3 Credits	1q	x	

○ Courses to be chosen for 15 credits minimum amongst the suggested list:

⊗ LGBIO2030A	Biomaterials	Sophie Demoustier, Christine Dupont, Gaëtane Leloup	30h+10h	3 Credits	1q	x	x
⊗ LBRNA2202	Nano-biotechnologies	Yves Dufrêne	30h	3 Credits	2q	x	x
⊗ LBBMC2104	Biochimie physiologique animale	Cathy Debier, Marc Francaux, Pierre Morsomme (compensates Marc Francaux), Yves-Jacques Schneider (coord.)	36h+18h	5 Credits	2q	x	x
⊗ LBBMC2106	Génétique moléculaire et génomique microbiennes ■	Bernard Hallet, Pascal Hols	36h+18h	5 Credits	2q	x	x
⊗ LBBMC2107	Physiologie cellulaire microbienne	Stephan Declerck, Michel Ghislain, Bernard Hallet, Pascal Hols, Pierre Morsomme	36h+18h	5 Credits	2q	x	x
⊗ LBBMC2108	Génétique moléculaire et génomique végétale ■	Henri Batoko, François Chaumont (coord.), Xavier Draye	36h+18h	5 Credits	2q	x	x
⊗ LBBMC2109	Physiologie cellulaire végétale	Henri Batoko, Marc Boutry, François Chaumont, Pierre Morsomme	36h+18h	5 Credits	2q	x	x
⊗ LBBMC2110	Génétique moléculaire et génomique animales et humaines ■	Françoise Gofflot, Bernard Knoops, René Rezsóhazy	36h+18h	5 Credits	2q	x	x
⊗ LBBMC2111	Physiologie cellulaire animale et humaine	Patrick Dumont, Bernard Knoops	36h+18h	5 Credits	2q	x	x
⊗ LBBMC2203	Ateliers interuniversitaires	Patrice Soumillion (coord.)	40h+40h	5 Credits		x	x
⊗ LBBMC2101	Biochimie structurale et fonctionnelle	Pierre Morsomme, Patrice Soumillion	36h+6h	4 Credits	1q	x	x
⊗ LBRT2201	Human and environmental toxicology	Alfred Bernard, Cathy Debier (coord.)	45h+7.5h	5 Credits	1q	x	x
⊗ LBIO1335	Immunology	Jean-Paul Dehoux	25h+15h	3 Credits	1q	x	x

○ Courses to be chosen for 5 credits minimum.

NANOBIOTECHNOLOGY, MATERIELS AND CATALYSIS (OPTION 3C)**[30.0]**

○ Mandatory

△ Courses not taught during 2015-2016

⊕ Periodic courses taught during 2015-2016

⊗ Optional

⊖ Periodic courses not taught during 2015-2016

■ Activity with requisites

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

						Year	
						1	2
○ LGBIO2030A	Biomaterials	Sophie Demoustier, Christine Dupont, Gaëtane Leloup	30h+10h	3 Credits	1q		x
○ LBRNA2102	Material surface characterisation	David Alsteens, Christine Dupont (coord.), Eric Gaigneaux	52.5h	5 Credits	2q	x	
○ LBRNA2103	Chemistry of solids	Eric Gaigneaux	42h	4 Credits	1q	x	
○ LMAPR2019	Polymer Science and Engineering	Sophie Demoustier, Alain Jonas, Evelyne Van Ruymbeke	45h+15h	5 Credits	1q	x	
○ LBRNA2201	Principles in heterogeneous catalysis	Eric Gaigneaux	52.5h	5 Credits	1q		x
○ LBRNA2202	Nano-biotechnologies	Yves Dufrêne	30h	3 Credits	2q	x	
○ LBBMC2101A	Biochimie structurale et fonctionnelle	N.	20h	2 Credits	1q		x

○ Courses to be chosen for 3 credits minimum amongst the following list p.e.:

⊗ LMAPR2010	Polymer Materials ■	Christian Bailly, Bernard Nysten	45h+15h	5 Credits	1q		x
⊗ LMAPR2016	Project in Polymer Science ■	Charles-André Fustin, Alain Jonas	0h+45h	5 Credits	2q		x
⊗ LMAPR2018	Rheometry and Polymer Processing ■	Christian Bailly, Evelyne Van Ruymbeke	30h +22.5h	5 Credits	2q		x
⊗ LMAPR2013	Physical Chemistry for Metals and Ceramics	Pascal Jacques	30h+30h	5 Credits	1q		x
⊗ LBRMC2201	Bioinformatics : DNA and protein sequences	Michel Ghislain (coord.), Jacques Mahillon	30h+15h	4 Credits	1q		x
⊗ LGBIO2030B	Biomaterials	N.	0h+20h	2 Credits	1q		x

ENVIRONMENTAL TECHNOLOGY, WATER, EARTH, AIR (OPTION 4C)
[30.0]

● Mandatory

△ Courses not taught during 2015-2016

⊕ Periodic courses taught during 2015-2016

⊗ Optional

⊖ Periodic courses not taught during 2015-2016

■ Activity with requisites

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

Year

1 2

● LBRES2103	Soil physics applied to Agronomy and Environment	Charles Bielders (compensates Mathieu Javaux), Charles Bielders (coord.), Mathieu Javaux	30h+15h	4 Credits	1q	x	
● LBRTE2101	Aquatic and soil biological and physical chemistry	Pierre Delmelle, Patrick Gerin (coord.)	37.5h +15h	5 Credits	1q	x	
● LBRTE2201	Human and environmental toxicology	Alfred Bernard, Cathy Debier (coord.)	45h+7.5h	5 Credits	1q		x

o Two courses to be chosen for 10 credits minimum:

⊗ LBRES2102	Engineering of the water and the pollutants in grounds and groundwaters	Sébastien Lambot, Marnik Vanclooster (coord.)	30h +22.5h	5 Credits	2q	x	x
⊗ LAUCE2191	Hydrogeology and Geoenvironment	Pierre-Yves Bolly, Alain Holeyman	40h+10h	5 Credits	2q	x	x
⊗ LMAPR2648	Sustainable treatment of industrial and domestic waste: Case studies	Damien Debecker, Olivier Françoisse, Patricia Luis Alconero, Olivier Noiset, Benoît Stenuit	30h+15h	5 Credits	2q	x	x
⊗ LMAPR2647	Sustainable treatment of industrial and domestic waste: Fundamentals	Jacques Devaux, Olivier Françoisse, Patricia Luis Alconero, Olivier Noiset	30h+15h	5 Credits	1q	x	x

o Free choice of courses for 6 credits.

INFORMATION ANALYSIS AND MANAGEMENT IN BIOLOGICAL ENGINEERING (OPTION 10C) [30.0]

● Mandatory

△ Courses not taught during 2015-2016

⊕ Periodic courses taught during 2015-2016

⊗ Optional

⊖ Periodic courses not taught during 2015-2016

■ Activity with requisites

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

Year

1 2

● LBRTI2202	Special questions in information management	Patrick Bogaert (coord.), Emmanuel Hanert	30h	3 Credits	2q		x
● LSINF1225	Object-oriented design and data management	Kim Mens	30h+30h	5 Credits	2q	x	
● LSTAT2320	Design of experiment.	Patrick Bogaert, Bernadette Govaerts	22.5h +7.5h	5 Credits	2q	x	
● LAGES2530	Communication des savoirs scientifiques	Philippe Verhaegen	30h	4 Credits	1q	x	x
● LBRTI2102	Process modelling and forecasting systems	Emmanuel Hanert	30h+15h	5 Credits	1q	x	x

○ Courses to be chosen for 8 ECTS minimum amongst the following list:

⊗ LBRA2102	Spatial modelling of territorial dynamics	Pierre Defourny, Julien Radoux (compensates Pierre Defourny)	15h+15h	3 Credits	2q		x
⊗ LSINF2224	Programming methods	Charles Pecheur	30h+15h	5 Credits	2q		x
⊗ LINGI1122	Program conception methods	Charles Pecheur	30h+30h	5 Credits	2q		x
⊗ LGEO2130	Geographic modelling	Eric Deleersnijder, Sophie Vanwambeke	30h+30h	5 Credits	2q		x
⊗ LELEC2920	Communication networks	Benoît Macq	30h+30h	5 Credits	1q		x
⊗ LELEC2870	Machine Learning : regression, dimensionality reduction and data visualization	John Lee (compensates Michel Verleysen), Michel Verleysen	30h+30h	5 Credits	1q		x
⊗ LSINF2275	Data mining & decision making	Marco Saerens	30h+30h	5 Credits	2q		x
⊗ LSTAT2350	Data Mining	Libei Chen	15h+15h	5 Credits	2q		x
⊗ LSTAT2120	Linear models	Christian Hafner	22.5h +7.5h	5 Credits	1q		x
⊗ LDEMO2220B	Population models and projections (Part B)	N.	25h+15h	5 Credits	1q		x
⊗ LDEMO2220A	Population models and projections (Part A)	N.	15h+5h	2 Credits	1q		x
⊗ LBIRA2101A	Biométrie: analyse de la variance	Xavier Draye, Anouar El Ghouch, Bernadette Govaerts	22h+10h	3 Credits	1q		x
⊗ LBRAI2101	Population and quantitative genetics	Philippe Baret (coord.), Xavier Draye	30h+7.5h	3 Credits	1q		x
⊗ LPHY2153	Introduction to the physics of the climate system and its modeling	Hugues Goosse, Jean-Pascal van Ypersele de Strihou	30h+15h	5 Credits	1q		x
⊗ LPHY2252	Supplements in climate system modeling	Michel Crucifix, Thierry Fichefet, Hugues Goosse, Qiuzhen Yin	45h+7.5h	6 Credits	2q		x
⊗ LECGE1333	Game theory and the information economy	Pierre Dehez (compensates Julio Davila Muro)	30h+10h	5 Credits	2q		x
⊗ LSTAT2020	Statistical computing	Céline Bugli	20h+20h	6 Credits	1q		x
⊗ LINGE1322	Computer science: Analysis and Design of Information Systems	Stéphane Faulkner, Stéphane Faulkner (compensates Jean Vanderdonckt), Jean Vanderdonckt	30h+15h	5 Credits	2q	x	x

BUSINESS CREATION (OPTION 13C) [30.0]

L'objectif du module CPME est de fournir aux étudiants, créateurs potentiels d'entreprise, les outils d'analyse et de réflexion qui les aideront à comprendre les processus entrepreneuriaux afin de créer ou reprendre une entreprise et de développer des projets de cette nature au sein d'organisations existantes.

En outre, cette formation permet aux étudiants de se familiariser avec d'autres disciplines et d'apprendre à travailler en équipes multidisciplinaires.

Les étudiants qui souhaitent suivre le module interdisciplinaire en Création d'entreprise (CPME) doivent s'y inscrire en même temps qu'à l'option dès la première année de master. En effet, le programme de ce module devra s'articuler avec celui de l'option sur les deux années de master. Attention: l'inscription à ce module fait l'objet d'une sélection. Ce n'est qu'après avoir reçu l'accord de participation à ce programme que les étudiants pourront prendre contact avec le vice-doyen pour aménager leur programme de cours personnel et répartir les cours CPME et les cours d'option sur les deux années du master.

○ Mandatory

△ Courses not taught during 2015-2016

⊕ Periodic courses taught during 2015-2016

⊗ Optional

⊖ Periodic courses not taught during 2015-2016

■ Activity with requisites

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

Access to this option is limited via a selection process at the beginning of the master programme (<http://www.uclouvain.be/cpme.html> ou cpme@uclouvain.be). Students enrolled for this option do not take the course LBIRC2210 (master thesis' accompanying seminar) and are required to take another course for 3 credits.

						Year	
						1	2
○ LCPME2001	Entrepreneurship Theory (in French)	Frank Janssen	30h+20h	5 Credits	1q	x	
○ LCPME2002	Managerial, legal and economic aspects of the creation of a company (in French)	Régis Coeurderoy, Yves De Cordt, Marine Falize (compensates Régis Coeurderoy)	30h+15h	5 Credits	1q	x	
○ LCPME2003	Business plan of the creation of a company (in French)	Frank Janssen	30h+15h	5 Credits	2q	x	x
○ LCPME2004	Advanced seminar on Entrepreneurship (in French)	Roxane De Hoe (compensates Frank Janssen), Frank Janssen	30h+15h	5 Credits	2q	x	

○ Courses to be chosen for 10 credits minimum among one of the others options of this master

Course prerequisites

A document entitled [en-prerequis-2015-birc2m.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 UCL 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.

BIRC2M - Information

Admission

General and specific admission requirements for this program must be satisfied at the time of enrolling at the university..

1. Être titulaire d'un diplôme universitaire de premier cycle en sciences de l'ingénieur, orientation bioingénieur (voir plus loin)
2. Apporter la preuve d'une maîtrise suffisante de la langue française (niveau B1 du [Cadre européen commun de référence](#))

Si le total de prérequis dépasse 15 crédits, l'accès au master est conditionné à la réussite de l'année préparatoire dont le programme est établi sur base du dossier de l'étudiant.

- [University Bachelors](#)
- [Non university Bachelors](#)
- [Holders of a 2nd cycle University degree](#)
- [Holders of a non-University 2nd cycle degree](#)
- [Adults taking up their university training](#)
- [Personalized access](#)

University Bachelors

Diploma	Special Requirements	Access	Remarks
UCL Bachelors			
Bachelor in Bioengineering	Additional module in Chemistry [30.0](unknown URL)	Direct access	
Bachelier en Sciences de l'ingénieur: orientation bioingénieur	Approfondissement en environnement	Access with additional training	L'étudiant bachelier en sciences de l'ingénieur, orientation bioingénieur ayant suivi au préalable la mineure d'approfondissement en environnement introduit un dossier auprès du vice-doyen, en mentionnant son curriculum détaillé. La commission propose à l'étudiant un programme adapté. Si le volume de cours dépasse les 15 crédits, une année supplémentaire pourra être envisagée.
Bachelier en Sciences de l'ingénieur: orientation bioingénieur	Approfondissement en agronomie	Access with additional training	L'étudiant bachelier en sciences de l'ingénieur, orientation bioingénieur ayant suivi au préalable la mineure d'approfondissement en agronomie introduit un dossier auprès du vice-doyen, en mentionnant son curriculum détaillé. La commission propose à l'étudiant un programme adapté. Si le volume de cours dépasse les 15 crédits, une année supplémentaire pourra être envisagée.
Others Bachelors of the French speaking Community of Belgium			
Bachelier en Sciences de l'ingénieur, orientation bioingénieur	Avoir suivi l'option spécifique en chimie	Direct access	
		On the file: direct access or access with additional training	
Bachelors of the Dutch speaking Community of Belgium			

		On the file: direct access or access with additional training	Les conditions d'accès seront définies au cas par cas en fonction des prérequis nécessaires.
Foreign Bachelors			
		On the file: direct access or access with additional training	Les conditions d'accès seront définies au cas par cas en fonction des prérequis nécessaires.

— Non university Bachelors

Diploma	Access	Remarks
> Find out more about links to the university		
> BA en agronomie > BA en chimie (toutes finalités) > BA en chimie finalité biochimie > BA-AESI en sciences: biologie, chimie, physique	Accès au master moyennant ajout de maximum 60 crédits d'enseignements supplémentaires obligatoires au programme. Voir 'Module complémentaire'	Type court
> BA en sciences agronomiques - type long > BA en sciences industrielles - type long	Accès au master moyennant ajout de maximum 60 crédits d'enseignements supplémentaires obligatoires au programme. Voir 'Module complémentaire'	Type long

— Holders of a 2nd cycle University degree

Diploma	Special Requirements	Access	Remarks
"Licenciés"			
Ingénieur chimiste et des bioindustries		On the file: direct access or access with additional training	
Ingénieur agronome		On the file: direct access or access with additional training	
Bioingénieur		On the file: direct access or access with additional training	
		On the file: direct access or access with additional training	
		On the file: direct access or access with additional training	
		On the file: direct access or access with additional training	
		On the file: direct access or access with additional training	Les masters bioingénieur peuvent également être accessibles sur dossier et notamment par validation des acquis de l'expérience (VAE).
Masters			
		On the file: direct access or access with additional training	
		On the file: direct access or access with additional training	
		On the file: direct access or access with additional training	

		On the file: direct access or access with additional training	
		On the file: direct access or access with additional training	
		Direct access	

— Holders of a non-University 2nd cycle degree

Diploma	Access	Remarks
> Find out more about links to the university		
<ul style="list-style-type: none"> > MA architecte paysagiste > MA en sciences agronomiques > MA en sciences de l'ingénieur industriel en agronomie > MA en sciences de l'ingénieur industriel, finalités chimie et biochimie > MA en sciences industrielles, finalités chimie et biochimie 	Accès direct au master moyennant ajout éventuel de 15 crédits max	Type long

— Adults taking up their university training

> See the website www.uclouvain.be/en-vae

Tous les masters peuvent être accessibles selon la procédure de valorisation des acquis de l'expérience.

— Personalized access

Reminder : all Masters (apart from Advanced Masters) are also accessible on file.

— Admission and Enrolment Procedures for general registration

Supplementary classes

To enrol for this Masters, the student must have a good command of certain subjects. If this is not the case, they must add preparatory modules to their Master's programme.

● Mandatory

△ Courses not taught during 2015-2016

⊕ Periodic courses taught during 2015-2016

⊗ Optional

⊖ Periodic courses not taught during 2015-2016

■ Activity with requisites

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

Students not meeting the prerequisite for this master will have to follow a number of supplementary courses. The programme will be established with the Study Adviser of the Faculty.

●	Supplementary classes	N.	Credits
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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) :

- same programme for SC and AGRO in first year (BIR11BA),
- special programme in second year (BIR12BA) for all the BIR students
- distinct programme with 30 credits for option courses in third year (BIRC13BA, BIRA13BA, BIRE13BA) : three advanced subsidiary subjects available : chemistry (BIRC), agronomy (BIRA), environment (BIRE).

2nd cycle (Master) :

à€ choice of three Masters in Bioengineering with a professional focus, together with twelve option courses 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 twelve option courses, which partly overlap at the level of the three 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 chemistry and bioindustry**. This is reflected by :

- availability of courses organized by other faculties ;
- grouping of training activities : combined exercises, joint project, analysis of real situations, simulations ;
- the perception, analysis, diagnosis and content of the course specifications (management, design of new processes etc) combine different kinds of tools (field observation, laboratory analysis, databases, chimiometrics etc) and various scales in space (from the molecular to plots of land and farms, from an agricultural region to a sub-continent and beyond) and in time ;
- teaching teams with a wide range of expertise ;
- learning how best to work in groups of students to develop a real, independent capacity for intellectual work.

Training for research, through research, which is essential for conceptual and innovative awareness and developing intellectual rigour, is reflected by different types of activities :

- producing a final dissertation and taking part in dissertation seminars ;
- participation in subject seminars providing direct contact with young researchers working in the field of chemistry, applied biology and bioindustry;
- presentation of seminars by students from an outside research group or groups and the production of a dissertation.

The application of skills, knowledge and techniques that students have acquired and how they use them together is taken into account in an integrated project in applied chemistry and biology. This is an important learning activity supplements the dissertation which, in the view of the Faculty, remains the most important part of training for research.

Through the close connection between the teaching and research, the development of new tools and new approaches is the subject of advanced training from the beginning of the 2nd cycle and is therefore central to this Master programme (e.g. biotechnology and nanotechnology). All this enables graduates of this programme to be able to make rapid use of new techniques and approaches in their early professional experience.

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".

Students are assessed according to the activities in the programme : this can take the form of written and/or oral examinations as well as individual and/or group work.

Further details about how the assessment is done can be found in the course specifications.

Mobility and/or Internationalisation outlook

The programme for the Master in Chemistry and Bio-industries offers a wide range of opportunities to study at other institutions, in Belgium, Europe and elsewhere.

The Faculty would like to highlight the strengths of this programme, particularly the potential for research and the fact that it is very much a part of a complete University. The shape of the option courses available has also been influenced by the different fields of activity in which bioengineers work.

There are two kinds of international mobility : students who have already gained their Bachelor degree can move abroad to study for their Master at another institution ; it is also possible to take some course modules in another institution. The mobility rate for AGRO

students on exchange schemes such as Erasmus is around 30-40% and the number of our students who go abroad is similar to the number of foreign students who come to study here.

This mobility should increase given the harmonization of education at the European level and the conclusion of new partnership agreements outside ERASMUS as well as membership of thematic networks. The AGRO Faculty is also a member of the ATHENS network.

In particular, the programme of the Master in Chemistry and Bio-industries offers an option course on brewing, organized in cooperation with the University of Lorraine (France). The precise terms for the exchange of course and students between the two institutions are still being negotiated and will be announced as soon as possible.

Possible trainings at the end of the programme

The Master in Bioengineering programme follows on directly from the Bachelor in Engineering Science (Bioengineering) with an option course in Chemistry.

Successful completion of this programme enables direct entry to other training programmes in the second and third cycles.

- **Advanced Masters** : The Advanced Masters in the field authorized by regulations in addition to those established by the University Development Commission (Commission Universitaire au Développement à€" CUD) in the same field.
- **Doctoral programmes** : doctorates in Agronomic Sciences and Biological Engineering.

Contacts

Curriculum Management

Entite de la structure AGRO

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Dénomination	Faculté des bioingénieurs	
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Secteur	Secteur des sciences et technologies (SST)	
Faculté	Faculté des bioingénieurs (AGRO)	
Mandats	Yvan Larondelle	Doyen
	Christine Devlesaver	Directeur administratif de faculté
Commissions de 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 : [Eric Gaigneaux](#)

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Président : [Pierre Bertin](#)

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Usefull Contacts

- Informations pour les étudiants: Conseiller aux études : [Patrick Bogaert](#)

