

BIRC2M

2013 - 2014

Master [120] in Chemistry and Bio-industries

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 d'ingénierie biologique, agronomique et
environnementale (AGRO)**Programme code: **birc2m** - European Qualifications Framework (EQF): 7**Table of contents**

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BIRC2M - Introduction

BIRC2M - Admission

For the specific conditions of this program : refer to the French version

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

BIRC2M - Information

Learning outcomes

Erreur de transformation xhtml vers fo pour 'programme_detaille' erreur=org.xml.sax.SAXParseException; lineNumber: 884; columnNumber: 706; Le préfixe "o" de l'élément "o:p" n'est pas lié.

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) :

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

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 " CUD) in the same field.
- **Doctoral programmes** : doctorates in Agronomic Sciences and Biological Engineering.

BIRC2M - Contacts

Curriculum Managment

Entite de la structure AGRO

Sigle	AGRO	
Dénomination	Faculté des bioingénieurs	
Adresse	Croix du Sud, 2 bte L7.05.01 1348 Louvain-la-Neuve Tél 010 47 37 19 - Fax 010 47 47 45	
Site web	https://www.uclouvain.be/agro	
Secteur	Secteur des sciences et technologies (SST)	
Faculté	Faculté des bioingénieurs (AGRO)	
Mandats	Philippe Baret Christine Devlesaver	Doyen 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](#)

Jury

Président : **Pierre Bertin**

Secrétaire du jury 1ère année de master : **Anne Legrève**

Secrétaire du Jury de la 2ième année de master : **Quentin Ponette**

Usefull Contacts

- Informations pour les étudiants: Conseiller aux études : **Patrick Bogaert**

BIRC2M - Detailed programme

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.

Whatever the focus or the options chosen, the programme of this master shall totalize 120 credits, spread over two years of studies each of 60 credits.

> [Tronc commun](#) [en-prog-2013-birc2m-lbirc200t.html]

> [Professional focus](#) [en-prog-2013-birc2m-lbirc200s]

Options courses

- > [Science, Technology and Food Quality \(Option 1C\)](#) [en-prog-2013-birc2m-lbirc201o.html]
- > [Biomolecular and Cellular Engineering \(Option 2C\)](#) [en-prog-2013-birc2m-lbirc202o.html]
- > [Nanobiotechnology, Materials and Catalysis \(Option 3C\)](#) [en-prog-2013-birc2m-lbirc203o.html]
- > [Environmental Technology, Water, Earth, Air \(Option 4C\)](#) [en-prog-2013-birc2m-lbirc204o.html]
- > [Information Analysis and Management in Biological Engineering \(Option 10C\)](#) [en-prog-2013-birc2m-lbirc210o.html]
- > [Business Creation \(Option 13C\)](#) [en-prog-2013-birc2m-lbirc213o.html]

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 2013-2014

⊕ Periodic courses taught during 2013-2014

⊗ Optional

⊖ Periodic courses not taught during 2013-2014

‡ Two years course

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

L'étudiant choisira le programme du tronc commun en fonction de son choix d'option.

Year

1 2

⊗ Programme for the options 1C,2C,3C,4C and 13C (60 credits)

Students taking option 3C must add the course LBIRC2106 to their programme in year 1.

○ LBIRC2200	Master thesis	N.		27 Credits			x
○ LBIRC2210	Seminars accompanying the dissertation	Marc Boutry, Sonia Collin, Stephan Declerck (coord.), Yves Dufrêne (compensates Christine Dupont), Christine Dupont, Eric Gaigneaux, Patrick Gerin	30h	3 Credits	1+2q		x
○ LBIRC2107	Integrated exercises in applied chemistry and bioindustries	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	
○ LBIRC2201	Project in industrial chemistry	Patrick Gerin	52.5h	5 Credits	1q		x
○ LMAPR2330	Reactor Design	Juray De Wilde	30h+30h	5 Credits	1q		x
○ LBIRC2106	Chemometrics	Bernadette Govaerts	22.5h +15h	3 Credits	1q	x	x

○ Cours au choix libre en 2ème année de master (5 credits)

○ Religious Sciences: one course to choose among the following: (2 credits)

⊗ 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

						Year	
						1	2
⊗ LTECO2300	Questions of religious sciences: questions about ethics	Philippe Cochinaux	15h	2 Credits	1q	x	x

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

○ LBIRC2200	Master thesis	N.		27 Credits			x
○ LBIRC2210	Seminars accompanying the dissertation	Marc Boutry, Sonia Collin, Stephan Declerck (coord.), Yves Dufrêne (compensates Christine Dupont), Christine Dupont, Eric Gaigneaux, Patrick Gerin	30h	3 Credits	1+2q		x
○ LBIRC2107	Integrated exercises in applied chemistry and bioindustries	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
○ LBIRA2101	Biometry : analysis of the variance	Xavier Draye (coord.), Anouar El Ghouch, Bernadette Govaerts	30h+15h	4 Credits	1q		x
○ LBIRC2201	Project in industrial chemistry	Patrick Gerin	52.5h	5 Credits	1q		x
○ LBRTI2102	Process modelling and forecasting systems	Emmanuel Hanert	30h+15h	5 Credits	1q		x

○ Cours au choix libre en 1ère année de master (4 credits)

○ Religious Sciences: one course to choose among the following: (2 credits)

⊗ 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
⊗ LTECO2300	Questions of religious sciences: questions about ethics	Philippe Cochinaux	15h	2 Credits	1q	x	x

Professional focus [30.0]

○ Mandatory

△ Courses not taught during 2013-2014

⊕ Periodic courses taught during 2013-2014

⊗ Optional

⊖ Periodic courses not taught during 2013-2014

⊠ Two years course

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, Pierre Morsomme	37.5h +45h	7 Credits	1q	x	
○ LBIRC2102	Organic analysis II	Sonia Collin (coord.), Raphaël Robiette	45h+30h	7 Credits	2q		x
○ LBIRC2104	Analytical chemistry II	Christine Dupont, Yann Garcia (compensates Christine Dupont), Yann Garcia (coord.)	22.5h +30h	5 Credits	1q		x
○ LBIRC2108	Biochemical and Microbial Engineering	Spyridon Agathos	30h +22.5h	5 Credits	2q		x

Year

1 2

LBIRC2105	Physical chemistry II	Damien Debecker	45h+15h	6 Credits	1q	x
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Options [30.0]

- > Science, Technology and Food Quality (Option 1C) [en-prog-2013-birc2m-lbirc201o]
- > Biomolecular and Cellular Engineering (Option 2C) [en-prog-2013-birc2m-lbirc202o]
- > Nanobiotechnology, Materials and Catalysis (Option 3C) [en-prog-2013-birc2m-lbirc203o]
- > Environmental Technology, Water, Earth, Air (Option 4C) [en-prog-2013-birc2m-lbirc204o]
- > Information Analysis and Management in Biological Engineering (Option 10C) [en-prog-2013-birc2m-lbirc210o]
- > Business Creation (Option 13C) [en-prog-2013-birc2m-lbirc213o]

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

○ Mandatory

△ Courses not taught during 2013-2014

⊕ Periodic courses taught during 2013-2014

⊗ Optional

⊖ Periodic courses not taught during 2013-2014

‡ Two years course

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
○ LBRTE2201	Human and environmental toxicology	Alfred Bernard, Cathy Debier (coord.)	45h+7.5h	5 Credits	1q		x

○ Deux cours au choix en 1ère année de master pour 10 crédits parmi les intitulés suivants:

⊗ LBRAL2102	Physiological and nutritional biochemistry	Yvan Larondelle (coord.), Yves-Jacques Schneider	52.5h	5 Credits	1q	x	
⊗ LBRAL2105	Brewing biochemistry	Stephan Declerck (coord.), Laurence Gijs, Laurent Mélotte	30h +22.5h	5 Credits	1q	x	
⊗ LBRAL2106	Brewing biochemistry	Sonia Collin	30h +22.5h	5 Credits	1q	x	

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

● Mandatory

△ Courses not taught during 2013-2014

⊕ Periodic courses taught during 2013-2014

⊗ Optional

⊖ Periodic courses not taught during 2013-2014

‡ Two years course

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

Year

1 2

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

○ Cours au choix pour 15 crédits minimum parmi les intitulés suivants:

Un cours pour 5 crédits minimum sera choisi obligatoirement en 1ère année de master et deux cours pour 10 crédits minimum en 2ème année de master.

⊗ LGBIO2030A	Biomaterials A	Sophie Demoustier, Christine Dupont, Gaëtane Leloup	30h+10h	3 Credits	1q	x	x
⊗ LBRNA2202	Nano-biotechnologies	Yves Dufrene	30h	3 Credits	2q	x	x
⊗ LBBMC2104	Biochimie physiologique animale	Cathy Debier, 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		x	x
⊗ LBBMC2107	Physiologie cellulaire microbienne	Stephan Declerck, Michel Ghislain, Bernard Hallet, Pascal Hols, Pierre Morsomme	36h+18h	5 Credits		x	x
⊗ LBBMC2108	Génétique moléculaire et génomique végétale	Henri Batoko, François Chaumont (coord.), Xavier Draye	36h+18h	5 Credits		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 Rezsöházy	36h+18h	5 Credits		x	x
⊗ LBBMC2111	Physiologie cellulaire animale et humaine	Patrick Dumont, Bernard Knoops	36h+18h	5 Credits		x	x
⊗ LBBMC2203	Ateliers interuniversitaires	Henri Batoko, Marc Boutry, François Chaumont, Cathy Debier, Bernard Hallet, Bernard Knoops, Yvan Larondelle, Pierre Morsomme, Patrice Soumillion (coord.)	40h+40h	5 Credits		x	x
⊗ LBBMC2101	Biochimie structurale et fonctionnelle	Pierre Morsomme, Patrice Soumillion	36h+6h	4 Credits		x	x

○ Cours au choix libre en 1ère année de master pour 5 crédits minimum

NANOBIOTECHNOLOGY, MATERIELS AND CATALYSIS (OPTION 3C)

[30.0]

○ Mandatory

△ Courses not taught during 2013-2014

⊕ Periodic courses taught during 2013-2014

⊗ Optional

⊖ Periodic courses not taught during 2013-2014

‡ Two years course

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

						Year	
						1	2
○ LGBIO2030A	Biomaterials A	Sophie Demoustier, Christine Dupont, Gaëtane Leloup	30h+10h	3 Credits	1q		x
○ LBRNA2102	Material surface characterisation	David Alsteens, Christine Dupont (coord.), Eric Gaigneaux, Michel Genet (compensates Christine Dupont)	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	Pierre Morsomme, Patrice Soumillion	20h	2 Credits	1q		x

○ **Cours à choisir en 2ème année de master pour 3 crédits minimum prioritairement parmi les intitulés suivants:**

⊗ 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	Philippe Baret, Michel Ghislain (coord.)	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 2013-2014

⊕ Periodic courses taught during 2013-2014

⊗ Optional

⊖ Periodic courses not taught during 2013-2014

‡ Two years course

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

						Year	
						1	2
● LBRES2103	Soil physics	Charles Bielders (coord.), Mathieu Javaux (compensates Charles Bielders), 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

○ Cours au choix en 1ère année de master pour minimum 8 crédits parmi les intitulés suivants:

⊗ LBRES2102	Soil hydrodynamics : modelling	Sébastien Lambot, Marnik Vanclooster (coord.)	30h +22.5h	5 Credits	2q	x	
⊗ LMAPR2643	Treatment of liquid effluents	Spyridon Agathos, Léon Duvivier	30h+7.5h	4 Credits	1q	x	
⊗ LMAPR2680	Treatments of gaseous wastes	Jacques Devaux, Olivier Françoisse	30h+7.5h	4 Credits	1q	x	
⊗ LMAPR2690	Valorisation and Treatment of Solid Wastes	Jacques Devaux, Joris Proost	30h+7.5h	4 Credits	1q	x	
⊗ LAUCE2191	Geoenvironment and Hydrogeology	Pierre-Yves Bolly, Alain Holeyman	45h+15h	5 Credits	2q	x	

○ Cours au choix libre en 1ère année de master pour atteindre 60 crédits pour l'année.

Ce volume de cours au choix libre d'option peut être couplé avec celui proposé en 2ème année pour arriver à un total de 30 ECTS pour l'option, réparti sur les deux années.

○ Cours au choix libre en 2ème année de master pour 5 crédits.

Ce volume de cours au choix libre d'option peut être couplé avec celui proposé en 1ère année. Pour rappel, l'étudiant doit suivre un total de 30 crédits pour l'option, réparti sur les deux années.

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

● Mandatory

△ Courses not taught during 2013-2014

⊕ Periodic courses taught during 2013-2014

⊗ Optional

⊙ Periodic courses not taught during 2013-2014

‡ Two years course

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

Year

1 2

● LBRMC2201	Bioinformatics : DNA and protein sequences	Philippe Baret, Michel Ghislain (coord.)	30h+15h	4 Credits	1q		x
● LBRTI2202	Special questions in information management	Patrick Bogaert (coord.), Emmanuel Hanert	30h	3 Credits	2q		x
● LBRTI2203	Communication scientifique dans le domaine des sciences exactes	Pascale Gualtieri (coord.), Joël Saucin	30h	3 Credits	1q		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	
● LINGE1322	Computer science: Analysis and Design of Information Systems	Jean Vanderdonckt	30h+15h	5 Credits	2q		x

● Courses for 5 ECTS minimm to be chosen preferably in Master 2 among the suggested list:

⊗ LBRAT2102	Spatial modelling of territorial dynamics	Pierre Defourny	15h+15h	3 Credits	2q		x
⊗ LSINF2224	Programming methods	Charles Pecheur	30h+15h	5 Credits	2q		x
⊗ LINGI1122	Program conception methods	José Vander Meulen	30h+30h	5 Credits	2q		x
⊗ LGEO2130	Geographic modelling	Eric Deleersnijder, Sophie Vanwambeke	30h+30h	5 Credits	2q		x
⊗ LELEC2920	Communication networks	Sébastien Lugan (compensates Benoît Macq)	30h+30h	5 Credits	1q		x
⊗ LELEC2870	Machine Learning : regression, dimensionality reduction and data visualization	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
⊗ LINGI2368	Computational biology	N.	30h+15h	5 Credits	1q	△	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	2q		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	45h	4 Credits	1q		x
⊗ LPHY2153	Introduction à la physique du système climatique et à sa modélisation	Hugues Goosse, Jean-Pascal van Ypersele de Strihou	30h+15h	5 Credits	1q		x
⊗ LPHY2252	Compléments de modélisation du système climatique	Michel Crucifix, Thierry Fichetef, Hugues Goosse	45h+7.5h	6 Credits	2q		x
⊗ LECGE1333	Game theory and the information economy	Pierre Dehez	30h+10h	5 Credits	2q		x
⊗ LSTAT2020	Statistical computing	Céline Bugli (compensates Bernadette Govaerts), Bernadette Govaerts	20h+20h	6 Credits	1q		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 2013-2014

⊕ Periodic courses taught during 2013-2014

⊗ Optional

⊖ Periodic courses not taught during 2013-2014

‡ Two years course

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

						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	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 Enterpreneurship (in French)	Frank Janssen	30h+15h	5 Credits	2q	x	

○ Cours au choix en 2ème année de master pour 10 crédits minimum

Ces cours au choix doivent être strictement choisis au sein des cours obligatoires d'une seule des autres options de ce master. La répartition des cours d'option sur les deux années de master se fera en concertation avec le vice-doyen.

