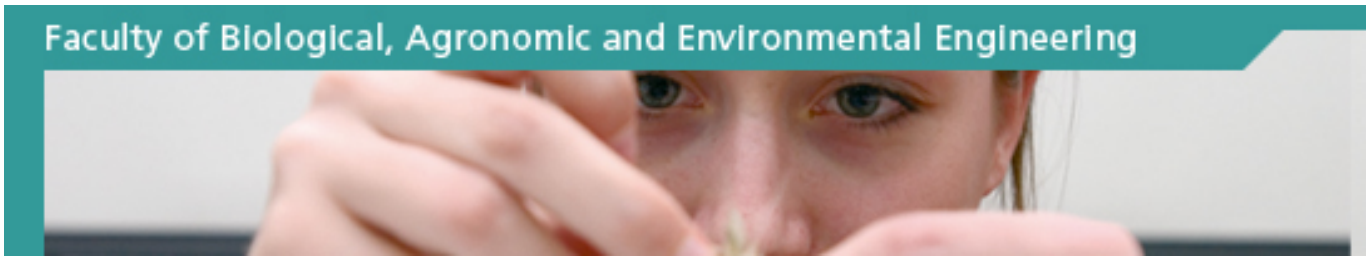

BIR 2 Bio-ingénieur (Bioengineer)

Programme management

AGRO Faculté d'ingénierie biologique, agronomique et environnementale
Responsable académique : Jacques Mahillon
Coordinators : 1st year : Pierre Bertin; 2nd year: Patrick Gérin; 3rd year : J. Mahillon

Study objectives

The two year "candidature" programme (1st cycle of university studies) and the third year (BIR21), currently the first year of the second cycle of studies, constitute a coherent whole, equivalent to the bachelor's programme in terms of the European harmonisation directives for higher university studies in the Bologne Declaration. Altogether, this three year course, with the solid subject knowledge and basic skills it provides, paves the way for the "master' level, not only in the Faculty of Biological, Agronomic and Environmental Engineering, but also in other university faculties, both in Belgium and abroad.
During the third year of the course, the student will choose one of the three proposed options : Agronomy (BIR A), Chemistry, (BIR C) or Environment (BIR E). Half of the programme is composed of courses common to the three orientations.The other half offers courses which are specific to each of them. Furthermore, a volume of 2 to 5 credits is reserved for options.
After the three first years, an entirely renovated programme has been in operation since 2004-05 for the 4th year, and since 2005-06 for the 5th year. This ensures the continuity of the programme of the first three years. Its structure and content are set in the spirit of the European harmonisation directives for higher study cursus included in the Bologne declaration.
On the level of the Bio-engineering "licence"studies, the student will choose one of the three options offered for the two final years of his programme. These three options are : "Agronomic Sciences", "Chemistry and Bio-industries" and " Environmental Sciences and Technologies". The polyvalent nature of the course continues to be assured by a certain number of core courses within each of the orientations, but the student also gets training in a specialised subject. He can, in fact, choose from five specialisations of which some are organised jointly in the context of two or three different options. Lastly, a large volume of optional subjects add a real personal touch to his training programme.

Admission conditions

The programe is accessible to holders of a "candidat" diploma in bioengineering or a university title obtained in Belgium or abroad, judged to be equivalent and by means of some minor adaptations to the programme if necessary.
In addition, the special exams called "passerelles" in French, described below, are organised for diploma holders in non-university higher education.
The following diploma holders :

- "candidat" in industrial engineering
- "gradué" (non-university) higher education diploma in the agricultural category : agronomy and garden and landscape architecture
- "gradué" (non-university) higher education diploma in the paramedical sector : medical biology cection, dietetics, clinical laboratory and clinical chemistry analyses
- "gradué" (non-university) higher education diploma in the AESI category : normal and secondary sections, general secondary (natural sciences, sciences and geography)
- "gradué" (non-university) higher education diploma in the technical category : chemistry and biochemistry (biotechnology)

are entitled ccess to the 2nd study cycle of the Faculty of Biological, Agronomic and Environmental Engineering, subject to the passing of a prior preparatory year. The programme of this year, in principal, will be identical to that of the second year of the bachelor programme in bio-engineering, subject to possible minor adaptations depending on the type of course followed.
Diploma holders in :

- industrial engineering of the agricultural category : agriculture section
- industrial engineering of the technical category : chemistry (biochemistry) and textile section

have direct access to the second cycle of studies in the Faculty of Biological, Agronomic and Environmental Engineering. These students will be able to benefit from an adapted programme depending on their former studies and the orientation followed at UCL (three options).

The programme may comprise a maximum of 150 hours of complementary courses from the 1st and 2nd years of the bachelor programme and, in addition, certain courses from the 2nd cycle may enable the student to benefit from dispensations.

Admission procedure

Applications for equivalence of diplomas and requests relating to the specific exams called " passerelles" and non-university higher education diplomas should be addressed to the Academic Secretary of the Faculty of Biological, Agronomic and Environmental Engineering. The application will include, besides a copy of the diplomas obtained, a detailed description of the programme previously followed (course titles, timetable volumes, a brief description of the contents and the results obtained).

General structure of the programme

The programme comprises three years of studies. In 2005-06, the implementation of the general reform for the bioengineering programmes is effective for the three years of the second cycle.
The range of the different activities outlined in the programme is expressed in two ways : for each course, corresponding, on the one hand to timetable volumes of supervised course work/attendance and, on the other hand to credits (ECTS European system : European credit transfer system). In accordance with this concept, one year of a student's work is divided into 60 credits, all course attendance and work included. The credits are absolute values. They may, however, take a relative value from one programme to another.
The students of the 2nd study cycle have the possibility to follow an interdisciplinary module entitled : "Company Creation". This complementary programme is integrated into the basic programmes of the 2nd cycle in bioengineering, Law, Civil Engineering and Management Engineering. The objective of these interdisciplinary studies is to provide the potential student-creaters with the analytical and reflection tools that will help thep to create their own company.

Programme content

BIR 21 First year

Core courses in all options
Mathematics, Analysis and Data-processing

BIR1304	Probability and statistics (II)[22.5h+15h] (3 credits) (in French)	Patrick Bogaert
BIR1305	Introduction to systems analysis[10h+20h] (2.5 credits) (in French)	Philippe Baret (coord.), Pierre Defourny, Marnik Vanclooster

Sciences and Matter and Processes Engineering

BIR1310	Transfer phenomena[45h+15h] (4.5 credits) (in French)	Michel Giot

Life Sciences

BIR1321	Biochemistry II : metabolic pathways and their regulation[30h+15h] (3.5 credits) (in French)	Françoise Foury, Michel Ghislain (coord.), Yvan Larondelle
BIR1323	Microbiology[30h+15h] (3.5 credits) (in French)	Jacques Mahillon
BIR1322	General genetics[45h+15h] (5 credits) (in French)	Philippe Baret, Pierre Bertin

This course will be partly followed by the students who have chosen the Chemistry option :

BIR1322A	Génétique générale[30h+15h] (3.5 credits) (in French)	Philippe Baret, Pierre Bertin

Human Sciences

BIR1344	Operation and management of enterprises[30h+7.5h] (2.5 credits) (in French)	André Nsabimana
ANGL2480	English Communication skills for engineers[30h] (2 credits)	Ahmed Adrioueche, Isabelle Druant, Annick Sonck
BIR1345	Report on the work experience training[60h] (4 credits) (in French)	Pierre Bertin, Joseph Dufey (coord.), Eric Gaigneaux

Options
60 hours or 5 credits for the students enrolled on the Agronomy and Environment options
30 hours or 2 credits for the students enrolled on the Chemistry option
Specific courses for the different options
BIR21A : "Agronomy" Option
Sciences and Matter and Processes Engineering

BIR1312	Introduction to analytical chemistry[30h] (2.5 credits) (in French)	Joseph Dufey, Yves Dufrêne, Yves Dufrêne
BIR1313	Integrated exercises in soil and water chemistry[30h] (2.5 credits) (in French)	Bruno Delvaux, Joseph Dufey, Yves Dufrêne

Life Sciences

BIR1324	Animal physiology[30h+7.5h] (3 credits) (in French)	Cathy Debier, Isabelle Donnay

BIR1325	Physiologie du développement et systématique des plantes d'intérêt agronomique[30h+7.5h] (3 credits) (in French)	Pierre Bertin, Jean-Marie Kinet, Jean-François Ledent
Globe and Ecosystems Sciences		
BIR1331	Applied ecology[30h+7.5h] (3 credits) (in French)	Alain Peeters
BIR1332	Soil sciences[30h+7.5h] (3 credits) (in French)	Bruno Delvaux, Joseph Dufey
BIR1333	Bioclimatology[15h+7.5h] (2 credits) (in French)	Thierry Fichefet, Jean-Pascal van Ypersele de Strihou
BIR1335	Field excursions in pedology, agricultural ecology and forestry[22.5h] (2 credits) (in French)	Bruno Delvaux, Freddy Devillez, Joseph Dufey, Alain Peeters
Human Sciences		
BIR1342	Rural economy[30h+15h] (3.5 credits) (in French)	Bruno Henry de Frahan
BIR21C : "Chemistry" Option		
Sciences and Matter and Processes Engineering		
BIR1311	Thermodynamics[30h+15h] (3.5 credits) (in French)	Yann Bartosiewicz
BIR1314	Physical chemistry I[30h+30h] (4.5 credits) (in French)	Eric Gaigneaux, Daniel Peeters
CHIM2151	Analytical chemistry I[30h] (7.5 credits) (in French)	Yann Garcia (coord.), Paul Rouxhet
BIR1315	Practical exercises and seminars in analytical chemistry I[30h+30h] (4 credits) (in French)	Yann Garcia, Paul Rouxhet (coord.)
BIR1316	Integrated exercices in chemical analysis[45h] (3 credits) (in French)	Yann Garcia, Paul Rouxhet (coord.)
BIR1317	Organic chemistry (part II)[30h+15h] (3.5 credits) (in French)	Jacqueline Marchand
BIR1318	Organic analysis I : separation techniques[30h+60h] (5.5 credits) (in French)	Sonia Collin, Jacqueline Marchand
BIR1319	Colloïdal and surface chemistry[30h] (2.5 credits) (in French)	Paul Rouxhet
BIR21E : "Environment" option		
Sciences and Matter and Processes Engineering		
BIR1312	Introduction to analytical chemistry[30h] (2.5 credits) (in French)	Joseph Dufey, Yves Dufrêne, Yves Dufrêne
BIR1313	Integrated exercises in soil and water chemistry[30h] (2.5 credits) (in French)	Bruno Delvaux, Joseph Dufey, Yves Dufrêne
Life Sciences		
BIR1325	Physiologie du développement et systématique des plantes d'intérêt agronomique[30h+7.5h] (3 credits) (in French)	Pierre Bertin, Jean-Marie Kinet, Jean-François Ledent
Globe and Ecosystems Sciences		
BIR1331	Applied ecology[30h+7.5h] (3 credits) (in French)	Alain Peeters
BIR1332	Soil sciences[30h+7.5h] (3 credits) (in French)	Bruno Delvaux, Joseph Dufey
BIR1333	Bioclimatology[15h+7.5h] (2 credits) (in French)	Thierry Fichefet, Jean-Pascal van Ypersele de Strihou
BIR1334	Introduction to forestry sciences[30h+7.5h] (3 credits) (in French)	Quentin Ponette
BIR1335	Field excursions in pedology, agricultural ecology and forestry[22.5h] (2 credits) (in French)	Bruno Delvaux, Freddy Devillez, Joseph Dufey, Alain Peeters
Human Sciences		
BIR1343	Economy of natural resources and the environment[37.5h+7.5h] (3.5 credits) (in French)	Frédéric Gaspart

BIR22 Second year

BIR 22A: Option "Agronomic Sciences "		
Core courses for all specialisations		
BIRA2101	Biometry : analysis of the variance[30h+22.5h] (4 credits) (in French)	Christian Hafner, Eric Le Boulengé
BIRA2102	Applied biotechnology[30h+0h] (2.5 credits) (in French)	Pierre Bertin, Claude Bragard, Isabelle Donnay
BIRA2103	Economy and management of agricultural production[30h+7.5h] (3 credits) (in French)	Jean-Marie Bouquiaux
BIRC2109A	Génie des procédés : Opérations unitaires[22.5h+7.5h] (2.5 credits) (in French)	Marc Meurens
BIRA2104	Agricultural mechanisation[30h+0h] (~) (in French)	Charles Bielders

BIRA2105	Agricultural and rural policies[30h+0h] (2.5 credits) (in French)	Bruno Henry de Frahan
BIRA2106	Principles of phytiatry[30h+0h] (2.5 credits) (in French)	Claude Bragard, Henri Maraite
BIRA2107A	Productions animales : Principes[22.5h+7.5h] (3 credits) (in French)	Michel Focant
BIRA2107B	Productions animales : Alimentation[7.5h+7.5h] (1 credits) (in French)	Yvan Larondelle
BIRA2108A	Productions végétales : Principes[37.5h+15h] (4 credits) (in French)	Pierre Bertin, Xavier Draye, Jean-François Ledent
BIRA2108B	Productions végétales : Prairies et fourrages(1 credits) (in French)	Alain Peeters
BIRA2109A	Systèmes agraires et conduite de l'exploitation agricole : Systèmes agraires[22.5h] (2 credits) (in French)	Alain Peeters
BIRA2109B	Systèmes agraires et conduite de l'exploitation agricole : Conduite de l'exploitation[22.5h] (2 credits) (in French)	Jean-François Ledent, Alain Peeters

Courses specific to the different specialisations

S1A: Sciences, Technology and Food Quality

BIR1318A	Analyse organique I : techniques de séparation[30h] (2.5 credits) (in French)	Sonia Collin, Jacqueline Marchand
BRAL2101A	Biochimie des industries alimentaires :Fermentations levuriennes[15h] (1.5 credits) (in French)	Philippe Perpete
BRAL2101B	Biochimie des industries alimentaires :Fermentations bactériennes[15h] (1 credits) (in French)	Philippe Perpete
BRAL2102	Nutritional biochemistry and human food needs[45h+0h] (3.5 credits) (in French)	Yvan Larondelle
BRAL2103A	Chimie des denrées alimentaires : Constituants alimentaires majeurs(1.5 credits) (in French)	Sonia Collin
BRAL2103B	Chimie des denrées alimentaires : TP de chimie des constituants alimentaires majeurs(1 credits) (in French)	Sonia Collin
BRAL2103C	Chimie des denrées alimentaires : Constituants alimentaires mineurs(1.5 credits) (in French)	Sonia Collin
BRAL2103D	Chimie des denrées alimentaires :TP de chimie des constituants alimentaires mineurs(1 credits) (in French)	Sonia Collin
STAT2510	Statistical quality control.[15h] (2.5 credits) (in French)	Bernadette Govaerts
BRAL2104	Food microbiology[30h+30h] (5 credits) (in French)	Jacques Mahillon, Philippe Perpete

Free choice courses for 7 credits

S7A: Water and Soil Resources

BRES2101	Electronics and measurement[30h+22.5h] (4 credits) (in French)	Francis Labrique
BRES2102	Soil hydrodynamics : modelling[30h+30h] (5 credits) (in French)	Charles Bielders, Marnik Vanclooster
BRES2103	Soil physics[30h+22.5h] (4 credits) (in French)	Charles Bielders, Marnik Vanclooster

One course according to choice, from the two following :

BIRE2103	General hydrology[30h+30h] (5 credits) (in French)	Charles Bielders, Marnik Vanclooster
BIRE2104	Applied soil sciences[30h+30h] (5 credits) (in French)	Bruno Delvaux, Hugues Titeux (supplée Bruno Delvaux)

Courses according to choice, from the following list for 6 credits

Optional courses are offered on the programme of the 4th and 5th year for a total minimum volume of 12 credits; students will be mindful to balance the dividision of these courses.

Depending on his project, the student will either prioritise studies in a specific branch of studies or a combination of the 2 domains.

BRES2106	Integrated management of the soil-plant system[52.5h+22.5h] (6 credits) (in French)	Claude Chiang Naikan (supplée N.), Stephan Declerck, Bruno Delvaux, Xavier Draye, Jean-François Ledent, Bernard Toussaint
BRES2104	Hydraulics on open channels[22.5h+15h] (3 credits) (in French)	Marnik Vanclooster, Marnik Vanclooster
BRTE2101	Biological physico-chemistry of water and soil[37.5h+22.5h] (5 credits) (in French)	Joseph Dufey, Patrick Gerin
BRES2105	Industrial physics[37.5h+22.5h] (5 credits) (in French)	Eddy Jacques, Hervé Jeanmart
BRES2107	Material resistance[30h+30h] (5 credits) (in French)	David Johnson, Benoît Raucent,

		Jean-François Thimus

Free choice options for 3.5 credits

S8A : Integrated Agronomy - Animal, Vegetal and Economic Production

Core courses:

BIRA2107C	Productions animales : Améliorations(1 credits) (in French)	Philippe Baret
BIRA2107D	Productions animales : Principes d'hygiène(1 credits) (in French)	Jean-Paul Dehoux
BIRA2108C	Productions végétales : Phytotechnie intégrée en régions tempérées(2 credits) (in French)	Jean-François Ledent

Options from the five following lists for 18.5 credits :

Depending on his project, the student will prioritise studies in a specific subject area (vegetal, animal or economic) or a combination of all of the domains.

- List 1: Vegetal Production

BRAI2101	Population and quantitative genetics[52.5h+0h] (4 credits) (in French)	Philippe Baret, Xavier Draye
BRES2106C	Gestion intégrée du système sol-plante : Fertilisation(2 credits) (in French)	Jean-François Ledent, Bernard Toussaint
BRPP2103A	Phytopathologie(3 credits) (in French)	Claude Bragard, Henri Maraite
BIRA2109D	Systèmes agraires et conduite de l'exploitation agricole : Domaine végétal(1 credits) (in French)	Jean-François Ledent

- List 2: Animal Production

BRAI2102	Advanced animal physiology and biochemistry[22.5h+0h] (2 credits) (in French)	Cathy Debier, Isabelle Donnay, Yvan Larondelle
BRAI2101	Population and quantitative genetics[52.5h+0h] (4 credits) (in French)	Philippe Baret, Xavier Draye
BIRA2107E	Productions animales : Pathologie appliquée(1 credits) (in French)	Jean-Paul Dehoux
BIRA2109C	Système agraire et conduite de l'exploitation agricole : Domaine animal(1 credits) (in French)	Michel Focant

- List 3: Economics

BRAI2207	Agricultural market analysis[30h] (2.5 credits) ⊕ (in French)	Georges Honhon, Philippe Polomé
BRAI2209	Company strategy in agro-industrial sector[30h+0h] (2.5 credits) ∅ (in French)	Loic Sauvée
ECON2135A	Econométrie : méthodes et applications - 1ère partie[22.5h+22.5h] (4 credits) Δ (in French)	N.
BIR1343	Economy of natural resources and the environment[37.5h+7.5h] (3.5 credits) (in French)	Frédéric Gaspart
BRAI2207	Agricultural market analysis[30h] (2.5 credits) ⊕ (in French)	Georges Honhon, Philippe Polomé
BRAI2209	Company strategy in agro-industrial sector[30h+0h] (2.5 credits) ∅ (in French)	Loic Sauvée

- List 4 : Pluridisciplinary courses

Courses taught in the 5th year.

- List 5: Complementary courses

BRES2106A	Gestion intégrée du système sol-plante : Interaction sol-plantes(2 credits) (in French)	Bruno Delvaux, Xavier Draye
BRES2106B	Gestion intégrée du système sol-plante : Processus et cycles biopédologiques(2 credits) (in French)	Stephan Declerck
BRAI2103	Tropical phytotechnology[30h+0h] (2.5 credits) (in French)	Pierre Bertin
BREF2101	Fish farming[22.5h] (2 credits) (in French)	Xavier Rollin
BRAI2104	Tropical zootechnology[22.5h+0h] (2 credits) (in French)	Philippe Baret, Jean-Paul Dehoux
STAT2520	Design of experiment.[22.5h+7.5h] (5 credits) (in French)	Bernadette Govaerts, Eric Le Boulengé

Free choice courses for 5 credits

S9A : Integrated Protection of Plants

BRPP2101	Plant pathological agents (viruses, bacteria, fungi and nematodes)[37.5h+22.5h] (5 credits) (in French)	Claude Bragard, Henri Maraite, Didier Mugniery
BRPP2102	Entomology applied to agriculture[45h+15h] (5 credits) (in French)	Claude Bragard, Thierry Hance, Henri Maraite, Hans Van Dyck
BRES2106B	Gestion intégrée du système sol-plante : Processus et cycles	Stephan Declerck

	biopédologiques(2 credits) (in French)	
BRPP2103	Phytopathology[30h+30h] (5 credits) (in French)	Claude Bragard, Henri Maraite
BRPP2104	Malherbology[15h+7.5h] (2 credits) (in French)	Jean-François Ledent, Alain Peeters
BIRA2108C	Productions végétales : Phytotechnie intégrée en régions tempérées(2 credits) (in French)	Jean-François Ledent
Free choice courses for 6.5 credits		
S10A : Technologies and Information Management		
BRTI2101	Decision aids and operational research[37.5h+15h] (4 credits) (in French)	Frédéric Gaspart, Michel Herman
STAT2411A	Data Analysis[15h+7.5h] (2 credits) (in French)	Léopold Simar
BIRE2101	Statistical analysis of spatial and temporal data[22.5h+15h] (3 credits) (in French)	Patrick Bogaert
INGI2271	Database management systems[30h+30h] (5 credits) (in French)	Alain Pirotte (coord.), Marco Saerens
BRES2101	Electronics and measurement[30h+22.5h] (4 credits) (in French)	Francis Labrique
One course according to choice, from the following list :		
COMU2107	Communications law (in French)	
DESO2336	Intellectual Property Rights[30h] (4.5 credits) (in French)	N.
COMU2138	Scientific popularisation: theory and case study[30h] (3 credits) (in French)	Philippe Verhaegen
STAT2520	Design of experiment.[22.5h+7.5h] (5 credits) (in French)	Bernadette Govaerts, Eric Le Boulengé
Free choice courses for 6.5 credits		
BIR 22C: Option "Chemistry and Bio-industries"		
Core courses for all specialisations		
BIRC2101	Analyse biochimique[15h+22.5h] (3 credits) (in French)	François Chaumont, Pierre Morsomme
BIRC2102	Analyse organique II[52.5h+30h] (6.5 credits) (in French)	Sonia Collin, Joëlle Leclercq
BIRC2103	Molecular biology and concepts of genetic engineering[22.5h+22.5h] (3.5 credits) (in French)	Marc Boutry, François Chaumont
BIRC2104	Chimie analytique II[22.5h+30h] (4.5 credits) (in French)	Yann Garcia, Paul Rouxhet
BIRC2105	Chimie physique II[52.5h+22.5h] (6 credits) (in French)	Patricio Ruiz Barrientos
BIRC2106	Chemometrics[22.5h+15h] (3 credits) (in French)	Bernadette Govaerts
BIRC2107	Exercices intégrés en chimie appliquée et bioindustries[45h+0h] (3.5 credits) (in French)	Eric Gaigneaux, Patrick Gerin, Michel Ghislain, Michèle Mestdagh, Philippe Perpete
BIRC2108	Biochemical and Microbial Engineering[30h+30h] (5 credits) (in French)	Spyridon Agathos
BIRC2109	Process engineering : unit operations[52.5h+22.5h] (6 credits) (in French)	Marc Meurens, Patricio Ruiz Barrientos
Courses specific to the different specialisations		
S1C : Sciences, Technology and Food Quality		
BRAL2102A	Biochimie nutritionnelle et besoins alimentaires de l'homme : Nutrition et métabolisme(1.5 credits) (in French)	Yvan Larondelle
BRAL2102B	Biochimie nutritionnelle et besoins alimentaires de l'homme :Besoins alimentaires(1 credits) (in French)	Yvan Larondelle
BRAL2104	Food microbiology[30h+30h] (5 credits) (in French)	Jacques Mahillon, Philippe Perpete
Courses according to choice, from the following list for 5 credits:		
BRAL2103A	Chimie des denrées alimentaires : Constituants alimentaires majeurs(1.5 credits) (in French)	Sonia Collin
BRAL2103B	Chimie des denrées alimentaires : TP de chimie des constituants alimentaires majeurs(1 credits) (in French)	Sonia Collin
BRAL2103C	Chimie des denrées alimentaires : Constituants alimentaires mineurs(1.5 credits) (in French)	Sonia Collin
BRAL2103D	Chimie des denrées alimentaires :TP de chimie des constituants alimentaires mineurs(1 credits) (in French)	Sonia Collin
BRAL2103E	Chimie des denrées alimentaires :Constituants spécifiques de la bière et TP(2.5 credits) (in French)	Sonia Collin
Courses according to choice from the following list for 2.5 credits:		
BRAL2101A	Biochimie des industries alimentaires :Fermentations levuriennes[15h] (1.5 credits) (in French)	Philippe Perpete
BRAL2101B	Biochimie des industries alimentaires :Fermentations	Philippe Perpete

	bactériennes[15h] (1 credits) (in French)	
BRAL2101C	Biochimie des industries alimentaires :Biochimie du maltage et du brassage[15h] (1.5 credits) (in French)	Philippe Perpete
BRAL2101D	Biochimie des industries alimentaires :TP de biochimie des céréales[0h+15h] (1 credits) (in French)	Philippe Perpete
BRAL2101E	Biochimie des industries alimentaires :TP de biochimie de la levure[0h+15h] (1 credits) (in French)	Philippe Perpete

Free choice courses for 4 credits

S2C : Biomolecular and Cellular Biology

BRNA2101B	Biophysique :Protéines et acides nucléiques : structure et stabilité(2 credits) (in French)	Jacques Fastrez, Michèle Mestdagh
BRMC2101	Genetic engineering[22.5h+15h] (3 credits) (in French)	Marc Boutry
BRMC2102	Molecular physiology[22.5h+0h] (2 credits) (in French)	Marc Boutry, Michel Ghislain, Pierre Morsomme

Courses according to choice, from the following list for 4 or 5 credits:

MAPR2300	Process Control[30h+37.5h] (5 credits) (in French)	Georges Bastin, Denis Dochain
BRES2101	Electronics and measurement[30h+22.5h] (4 credits) (in French)	Francis Labrique
MAPR2145	Process Simulation[30h+15h] (4 credits) (in French)	Denis Dochain, Fernand Thyrion

Free choice courses for 8 credits

Modulable volume (7 or 8 credits) depending on the volume of hours of studies for the given choice.

S3C : Nanobiotechnologies, Materials and Catalysis

BRNA2101	Biophysics[52.5h+0h] (4 credits) (in French)	Jacques Fastrez, Michèle Mestdagh
BRNA2102	Material surface characterisation[52.5h+0h] (4.5 credits) (in French)	Yves Dufrêne, Paul Rouxhet
BRNA2103	Chemistry of solids[37.5h+0h] (3 credits) (in French)	Eric Gaigneaux
MAPR2381B	Chimie macromoléculaire[30h] (3 credits) (in French)	Jacques Devaux, Pierre Godard

Free choice courses for 4.5 credits

S4C : Environmental Technologies : Water, Sun, Air

The students enrolled for this specialisation have the choice between the BIRC 2107 course (core syllabus with BIR22C) and the BRTE 2102 course (BIR22 4E) specialisation

BRTE2101	Biological physico-chemistry of water and soil[37.5h+22.5h] (5 credits) (in French)	Joseph Dufey, Patrick Gerin
BRES2103A	Physique du sol : Théorie(2 credits) (in French)	Charles Bielders, Marnik Vanclooster
BIR1332	Soil sciences[30h+7.5h] (3 credits) (in French)	Bruno Delvaux, Joseph Dufey

Two courses according to choice, from the following list for 6 to 8 credits

AMCO2191	Geoenvironment[30h+15h] (4 credits) (in French)	Alain Holeyman
AMCO2191A	Géoenvironnement (partie)[30h] (3 credits) (in French)	Alain Holeyman

The AMCO2191 course, Partim A, can only be followed after the BRES 2102 course, Soil Hydrodynamics: Modelling

BRES2102	Soil hydrodynamics : modelling[30h+30h] (5 credits) (in French)	Charles Bielders, Marnik Vanclooster
MAPR2680	Treatments of gaseous wastes[30h+7.5h] (4 credits) (in French)	Jacques Devaux, Olivier Françoisse
MAPR2643	Treatment of liquid effluents[30h+7.5h] (4 credits) (in French)	Spyridon Agathos, Léon Duvivier
MAPR2690	Valorisation and Treatment of Solid Wastes[30h+7.5h] (4 credits) (in French)	Jacques Devaux, Joris Proost

Free choice courses for 3 credits

Modulable volume (1 to 3 credits), depending on the volume of study hours for the given choice.

S10C : Technologies and Information Management

The students enrolled for this specialisation are dispensed from taking the BIRC 2106 course, - Chimiometrics.

STAT2411A	Data Analysis[15h+7.5h] (2 credits) (in French)	Léopold Simar
BIRA2101	Biometry : analysis of the variance[30h+22.5h] (4 credits) (in French)	Christian Hafner, Eric Le Boulengé
INGI2271	Database management systems[30h+30h] (5 credits) (in French)	Alain Pirotte (coord.), Marco Saerens
BRES2101	Electronics and measurement[30h+22.5h] (4 credits) (in French)	Francis Labrique

A choice of one course from the following list

BIRE2101	Statistical analysis of spatial and temporal data[22.5h+15h] (3 credits) (in French)	Patrick Bogaert

STAT2520	Design of experiment.[22.5h+7.5h] (5 credits) (in French)	Bernadette Govaerts, Eric Le Boulengé

Free choice courses for 4 credits

BIR 22E: "Sciences and Environmental Technologies " option

Core course for all specialisations

STAT2411A	Data Analysis[15h+7.5h] (2 credits) (in French)	Léopold Simar
BIRE2101	Statistical analysis of spatial and temporal data[22.5h+15h] (3 credits) (in French)	Patrick Bogaert
BIRE2102	Geomatic applied to the environment[30h+22.5h] (4 credits) (in French)	Pierre Defourny
BIRE2103	General hydrology[30h+30h] (5 credits) (in French)	Charles Bielders, Marnik Vanclooster
BIRE2104	Applied soil sciences[30h+30h] (5 credits) (in French)	Bruno Delvaux, Hugues Titeux (supplée Bruno Delvaux)
BIRE2105	Water and soil quality[22.5h+7.5h] (2.5 credits) (in French)	Bruno Delvaux, Patrick Gerin, Henri Halen (supplée Bruno Delvaux), Xavier Rollin (supplée Bruno Delvaux)

Students of the S4E specialisation : Environmental Technologies : Water, Sun, Air, are dispensed from taking the Quality of water and soils course.

BIRA2109B	Systèmes agraires et conduite de l'exploitation agricole : Conduite de l'exploitation[22.5h] (2 credits) (in French)	Jean-François Ledent, Alain Peeters
BIRE2106	Topometry and photogrammetry[30h+22.5h] (4 credits) (in French)	Olivier Cogels, Pierre Defourny

Courses specific to the different specialisations

S4E : Environmental Technologies : Water, Sun, Air

BIR1319	Colloïdal and surface chemistry[30h] (2.5 credits) (in French)	Paul Rouxhet
BRES2101	Electronics and measurement[30h+22.5h] (4 credits) (in French)	Francis Labrique
BRTE2102	Integrated exercises in environmental science and technology[45h+0h] (3.5 credits) (in French)	Patrick Gerin, Patricio Ruiz Barrientos, Marnik Vanclooster
BIRC2109	Process engineering : unit operations[52.5h+22.5h] (6 credits) (in French)	Marc Meurens, Patricio Ruiz Barrientos
BRTE2101	Biological physico-chemistry of water and soil[37.5h+22.5h] (5 credits) (in French)	Joseph Dufey, Patrick Gerin
BRES2103	Soil physics[30h+22.5h] (4 credits) (in French)	Charles Bielders, Marnik Vanclooster
BIR1311	Thermodynamics[30h+15h] (3.5 credits) (in French)	Yann Bartosiewicz

Courses according to choice, from the following list for 3 to 4 credits :

These courses according to choice are offered on the programme of the 4th and 5th year for a total volume of 6 to 8 credits; the student will be attentive to balancing the division of these courses.

AMCO2191	Geoenvironment[30h+15h] (4 credits) (in French)	Alain Holeyman
AMCO2191A	Géoenvironnement (partie)[30h] (3 credits) (in French)	Alain Holeyman

The AMCO 2191course, Partim A, can only be followed after the BRES 2102 course, Soil Hydrodynamics : Modelling

BRES2102	Soil hydrodynamics : modelling[30h+30h] (5 credits) (in French)	Charles Bielders, Marnik Vanclooster
MAPR2643	Treatment of liquid effluents[30h+7.5h] (4 credits) (in French)	Spyridon Agathos, Léon Duvivier
MAPR2680	Treatments of gaseous wastes[30h+7.5h] (4 credits) (in French)	Jacques Devaux, Olivier Françoisse
MAPR2690	Valorisation and Treatment of Solid Wastes[30h+7.5h] (4 credits) (in French)	Jacques Devaux, Joris Proost

Free choice courses for 4 credits

Modulable volume (4 or 4 credits), depending on the volume of hours of studies for the given choice.

S5E : Territory Reorganisation

BRTI2101	Decision aids and operational research[37.5h+15h] (4 credits) (in French)	Frédéric Gaspart, Michel Herman
BRAT2101	Suburban and rural space development[30h+7.5h] (3 credits) (in French)	Pierre Defourny, Freddy Devillez
AMCO2955	Aspects juridiques de l'urbanisme et de l'aménagement du territoire[30h] (3 credits) (in French)	Francis Haumont
BRAT2102	Spatial modelling of territorial dynamics[15h+15h] (2.5 credits) (in French)	Pierre Defourny
BREF2105	Phytosociology[15h+30h] (3.5 credits) (in French)	Freddy Devillez, Freddy Devillez

		(supplée Anne-Laure Jacquemart), Anne-Laure Jacquemart
BIRA2105	Agricultural and rural policies[30h+0h] (2.5 credits) (in French)	Bruno Henry de Frahan
BRAT2103	Rural sociology and land development[30h] (2.5 credits) (in French)	Daniel Bodson

Courses according to choice, from the following list for 4 credits

BIRA2107A	Productions animales : Principes[22.5h+7.5h] (3 credits) (in French)	Michel Focant
BIRA2107B	Productions animales : Alimentation[7.5h+7.5h] (1 credits) (in French)	Yvan Larondelle
BIRA2108A	Productions végétales : Principes[37.5h+15h] (4 credits) (in French)	Pierre Bertin, Xavier Draye, Jean-François Ledent
BREF2107B	Sylviculture : Sylviculture appliquée(4 credits) (in French)	Quentin Ponette

Courses according to choice, from the following list for 2.5 credits

ENVI3006	Droit de l'environnement[30h] (4.5 credits) (in French)	Francis Haumont
ENVI3011	Méthodes d'évaluation et de gestion environnementale[30h] (3 credits) (in French)	Jean-Pierre Tack

Free choice courses for 5 credits

S6E : Nature, Water and Forests

BRTI2101A	Aide à la décision et recherche opérationnelle: Aide à la décision(2 credits) (in French)	Frédéric Gaspart
BREF2102	Wood anatomy and properties[30h+30h] (4.5 credits) (in French)	Tomas Avella y Shaw
BREF2103	Dendrometry and inventory of forest resources[30h+22.5h] (4 credits) (in French)	Quentin Ponette
BREF2104	Forestry engineering[22.5h] (2 credits) (in French)	Daniel Bemelmans
BREF2105	Phytosociology[15h+30h] (3.5 credits) (in French)	Freddy Devillez, Freddy Devillez (supplée Anne-Laure Jacquemart), Anne-Laure Jacquemart
BREF2106	Forest health and protection[22.5h+7.5h] (2.5 credits) (in French)	Claude Bragard, Thierry Hance, Henri Maraite
BREF2107A	Sylviculture : Ecologie forestière(2 credits) (in French)	Quentin Ponette
BREF2107B	Sylviculture : Sylviculture appliquée(4 credits) (in French)	Quentin Ponette

A choice of one course from the following list for 2 credits :

BIOL2191A	Ecologie (partim)[45h] (in French)	Anne-Laure Jacquemart
BREF2101	Fish farming[22.5h] (2 credits) (in French)	Xavier Rollin

Free choice courses for 6 credits

Modulable volume, depending on the volume of hours of studies for the given choice.

S7E : Water and Soil Resources

BRES2101	Electronics and measurement[30h+22.5h] (4 credits) (in French)	Francis Labrique
BRES2102	Soil hydrodynamics : modelling[30h+30h] (5 credits) (in French)	Charles Bielders, Marnik Vanclooster
BRES2103	Soil physics[30h+22.5h] (4 credits) (in French)	Charles Bielders, Marnik Vanclooster

Courses according to choice, from the following list for 14 credits :

Depending on his project, the students will prioritise either studies in a specific subject (water or soil), or a combination of the two domains.

BRES2106	Integrated management of the soil-plant system[52.5h+22.5h] (6 credits) (in French)	Claude Chiang Naikan (supplée N.), Stephan Declerck, Bruno Delvaux, Xavier Draye, Jean-François Ledent, Bernard Toussaint
BRES2104	Hydraulics on open channels[22.5h+15h] (3 credits) (in French)	Marnik Vanclooster, Marnik Vanclooster
BRTE2101	Biological physico-chemistry of water and soil[37.5h+22.5h] (5 credits) (in French)	Joseph Dufey, Patrick Gerin
BRES2105	Industrial physics[37.5h+22.5h] (5 credits) (in French)	Eddy Jacques, Hervé Jeanmart
BRES2107	Material resistance[30h+30h] (5 credits) (in French)	David Johnson, Benoît Raucent, Jean-François Thimus

Free choice courses for 5.5 credits

Modulable volume, depending on the volume of hours of studies for the given choice.

S10E : Technologies and Information Management

BRTI2101	Decision aids and operational research[37.5h+15h] (4 credits) (in French)	Frédéric Gaspart, Michel Herman
BRES2101	Electronics and measurement[30h+22.5h] (4 credits) (in French)	Francis Labrique
INGI2271	Database management systems[30h+30h] (5 credits) (in French)	Alain Pirotte (coord.), Marco Saerens
BIRA2101	Biometry : analysis of the variance[30h+22.5h] (4 credits) (in French)	Christian Hafner, Eric Le Boulengé

A choice of one course from the following list for 3 credits :

COMU2138	Scientific popularisation: theory and case study[30h] (3 credits) (in French)	Philippe Verhaegen
DESO2336	Intellectual Property Rights[30h] (4.5 credits) (in French)	N.
COMU2107	Communications law (in French)	
STAT2520	Design of experiment.[22.5h+7.5h] (5 credits) (in French)	Bernadette Govaerts, Eric Le Boulengé

Free choice of courses for 9.5 credits

BIR23 Third year

BIR 23A : "Agronomic Sciences Option"

Core courses for all specialisations

BIRA2201	Projet interdisciplinaire d'agronomie[37.5h] (3 credits) (in French)	Frédéric Gaspart, Yvan Larondelle, Henri Maraite
AGRO2300	Questions in religious sciences[15h] (2 credits) (in French)	Henri Wattiaux
BIRA2200	Mémoire de fin d'études(35 credits) (in French)	N.

Courses specific to the different specialisations

S1A : Sciences, Technologies and Food Quality

BRAL2201	Food technology[105h+7.5h] (8.5 credits) (in French)	Stéphane Dupire, Marc Meurens
BRTE2201	Human and animal toxicology[22.5h] (2 credits) (in French)	Alfred Bernard
BRTI2101A	Aide à la décision et recherche opérationnelle: Aide à la décision(2 credits) (in French)	Frédéric Gaspart

Free choice of courses for 8 credits

S7A : Water and Soil Resources

BRES2101	Electronics and measurement[30h+22.5h] (4 credits) (in French)	Francis Labrique

This course is followed exceptionally during the academic year 2005-06 for the students of the BIR23/7A course

BRES2201	Irrigation, drainage and soil preservation[37.5h+22.5h] (5 credits) (in French)	Charles Bielders, Guido Wyseure
BRES2202	Seminars on water and soil resources[22.5h] (2 credits) (in French)	Charles Bielders, Bruno Delvaux, Marnik Vanclooster

Free choice courses from the following list for 6 credits :

Depending on his project, the student will pioritise either studies in a particular subject (water or soil), or a combination of the 2 domains.

BRES2203	Soil management and planning in warm regions[22.5h+15h] (3 credits) (in French)	Charles Bielders, Bruno Delvaux
BRES2204	Integrated management of water resources[22.5h+15h] (3 credits) (in French)	Amaury Tilmant
BRES2205	Clay and solid constructions[22.5h+22.5h] (4 credits) (in French)	Sébastien Lambot

Courses according to choice, for a volume of 7 credits

Modulable volume, depending on the volume of the given course choice.

S8A : Integrated Agronomy - Animal, Vegetal and Economic Productions

BRAI2201	Integrated exercises in agronomy[30h] (2 credits) (in French)	Bernard Toussaint
BRES2201A	Irrigation, drainage et conservation des sols: Irrigation et drainage[22.5h+15h] (3 credits) (in French)	Charles Bielders
BRTI2101A	Aide à la décision et recherche opérationnelle: Aide à la décision(2 credits) (in French)	Frédéric Gaspart

Courses according to choice, from the five following list of course headings, for a volume of 9 credits :

- List 1 : Vegetal productions :

BRAI2202	Management of covered off-field cultures[15h+7.5h] (2	Pierre Bertin, Claude Bragard

	credits) (in French)	
BRAI2203	Genetic diversity and plant amelioration[37.5h] (3 credits) (in French)	Pierre Bertin, Jean-Marie Kinet
BRAI2204	Management of temperate and tropical pastoral systems[30h] (2.5 credits) (in French)	Alain Peeters

- List 2 : Animal productions :

BRAI2204	Management of temperate and tropical pastoral systems[30h] (2.5 credits) (in French)	Alain Peeters
BRAI2205	Genetic diversity and animal amelioration[37.5h] (3 credits) (in French)	Philippe Baret
BRAI2206	Technology and processing of animal products[22.5h] (2 credits) (in French)	Philippe Baret

- List 3 : Economics :

BRTI2101B	Aide a la décision et recherche opérationnelle:Recherche opérationnelle(2 credits) (in French)	Michel Herman
BRAI2207	Agricultural market analysis[30h] (2.5 credits) ⊕ (in French)	Georges Honhon, Philippe Polomé
BRAI2208	Seminar on rural economy[30h] (2.5 credits) (in French)	Frédéric Gaspart, Bruno Henry de Frahan
BRAI2209	Company strategy in agro-industrial sector[30h+0h] (2.5 credits) ⊘ (in French)	Loic Sauvée

- List 4 : Pluridisciplinary courses :

BIRE2201	Design and evaluation of projects[22.5h] (2 credits) (in French)	André Nsabimana
BIRE2202	Territorial and environmental diagnosis[7.5h+22.5h] (2.5 credits) (in French)	Pierre Defourny, Freddy Devillez, Frédéric Gaspart
BRAI2210	Integrated development[30h] (2.5 credits) (in French)	Jean-François Sneessens
BRAT2103	Rural sociology and land development[30h] (2.5 credits) (in French)	Daniel Bodson

- List 5 : Complementary courses

BRPP2102A	Entomologie appliquée à l'agriculture[22.5h+15h] (3 credits) (in French)	Thierry Hance, Hans Van Dyck
BRAI2211	Agrostology[22.5h+7.5h] (2.5 credits) (in French)	Alain Peeters
BRAI2212	Rural development economy[30h] (2.5 credits) (in French)	Frédéric Gaspart, Bruno Henry de Frahan
BRAI2213	Evaluation des politiques agricoles[30h] (2 credits) (in French)	Bruno Henry de Frahan
BRAI2215	Phytotechnology of horticultural crops[15h+7.5h] (2 credits) (in French)	Pierre Bertin
BRTE2201	Human and animal toxicology[22.5h] (2 credits) (in French)	Alfred Bernard
ENVI3006	Droit de l'environnement[30h] (4.5 credits) (in French)	Francis Haumont

Free choice courses for a volume of 5 credits

S9A : Integrated Protection of Plants

BRTI2101A	Aide à la décision et recherche opérationnelle: Aide à la décision(2 credits) (in French)	Frédéric Gaspart
BRPP2201	Biological control and integrated protection[22.5h] (2 credits) (in French)	Thierry Hance, Henri Maraite
BRPP2202	Phytoclinic (diagnosis, identification, causative agents and advises)[60h] (5 credits) (in French)	Claude Bragard, Henri Maraite
BRPP2203	Phytopharmacy[22.5h] (2 credits) (in French)	Henri Maraite
BRPP2204	Special questions in plant protection[30h] (2.5 credits) (in French)	Claude Bragard, Henri Maraite

Free choice of courses for a volume of 6.5 credits

S10A : Technologies and Information Management

BRES2101	Electronics and measurement[30h+22.5h] (4 credits) (in French)	Francis Labrique

This course is followed exceptionally durant the academic year 2005-06 by the students of BIR23/10A

BRTI2102	Process modelling and forescasting systems[22.5h+15h] (3 credits) (in French)	Philippe Baret, Patrick Bogaert, Xavier Draye (coord.)
BRTI2201	Complement to the interdisciplinary agronomy project[22.5h] (2 credits) (in French)	Cathy Debier, Frédéric Gaspart (coord.)
BRTI2202	Special questions in information management[37.5h] (3	Philippe Baret, Pierre Defourny

credits) (in French)

Choice of given courses for a volume of 9 credits

The students are invited to choose, for this volume of 9 credits of thematic modules to be specified from among "Biology and Gennetics", "Information and agriculture", "Environmental Evaluation and Follow-up". The content of these modules will be defined with the Study Advisor.

BIR 23C : "Chemistry and Bio-industries" Option

Core courses for all specialisations

MAPR2330	Reactor Design[30h+30h] (5 credits) (in French)	Denis Dochain
The S10 students are dispensed from taking this course		
BIRC2201	Project in industrial chemistry[60h] (5 credits) (in French)	Patrick Gerin
AGRO2300	Questions in religious sciences[15h] (2 credits) (in French)	Henri Wattiaux
BIRC2200	Mémoire de fin d'études(35 credits) (in French)	N.

Courses specific to the different specialisations

S1C : Sciences, Technology and Food Quality

BRTE2201	Human and animal toxicology[22.5h] (2 credits) (in French)	Alfred Bernard

Choice of courses from the following list for 5 credits :

The partim BRAL2201F "Integrated Project" is obligatory.

BRAL2201A	Technologie alimentaire:Opérations unitaires de séparation[22.5h] (1.5 credits) (in French)	Stéphane Dupire
BRAL2201B	Technologie alimentaire:Opérations unitaires de conservation[15h] (1 credits) (in French)	Marc Meurens
BRAL2201C	Technologie alimentaire:Procédés biotechnologiques[15h] (1 credits) (in French)	Stéphane Dupire
BRAL2201D	Technologie alimentaire:Transformations des produits végétaux et animaux[30h] (2.5 credits) (in French)	Marc Meurens
BRAL2201E	Technologie alimentaire : Contrôle de qualité[15h] (1 credits) (in French)	Marc Meurens
BRAL2201F	Technologie alimentaire : Projet intégré[7.5h+7.5h] (1.5 credits) (in French)	Marc Meurens

Free choice of courses for 6 credits

S2C : Biomolecular and Cellular Engineering

BRMC2201	Bioinformatics : DNA and protein sequences[30h+7.5h] (3 credits) (in French)	Michel Ghislain
BRMC2202	Cell culture technology[22.5h] (2 credits) (in French)	Marc Boutry (coord.), Claude Remacle, Yves-Jacques Schneider

Free choice of courses for 8 credits

Modulable volume, depending on the volume of the given options

S3C : Nanobiotechnologies, Materials and Catalysis

Choice of courses from the following list for 5 or 6 credits :

BRNA2201	Catalysis[37.5h] (3 credits) (in French)	Eric Gaigneaux
BRNA2202	Nano-biotechnologies[22.5h] (2 credits) (in French)	Yves Dufrêne
MAPR2392A	Physique des matériaux polymères[30h] (3 credits) (in French)	Alain Jonas, Roger Legras

Free choice of courses for a volume of 8 credits

Modulable volume, depending on the volume of the given options

S4C : Environmental Technologies : Water, Soil, Air

BRTE2201	Human and animal toxicology[22.5h] (2 credits) (in French)	Alfred Bernard

Free choice of courses for 11 credits

S10C : Technologies and Information Management

BRES2101	Electronics and measurement[30h+22.5h] (4 credits) (in French)	Francis Labrique
This course is followed exceptionally during the academic year 2005-06 by the BIR23/10C students		
BRTI2101	Decision aids and operational research[37.5h+15h] (4 credits) (in French)	Frédéric Gaspart, Michel Herman
BRTI2102	Process modelling and forescasting systems[22.5h+15h] (3 credits) (in French)	Philippe Baret, Patrick Bogaert, Xavier Draye (coord.)
BRTI2202	Special questions in information management[37.5h] (3 credits) (in French)	Philippe Baret, Pierre Defourny

Choice of one course from the following list :

COMU2107	Communications law (in French)	
DESO2336	Intellectual Property Rights[30h] (4.5 credits) (in French)	N.

COMU2138	Scientific popularisation: theory and case study[30h] (3 credits) (in French)	Philippe Verhaegen

Free choice of courses for a volume of 6 credits

BIR23E : "Environmental Sciences and Technologies" Option

Core courses for all specialisations

BIRE2201	Design and evaluation of projects[22.5h] (2 credits) (in French)	André Nsabimana
BIRE2202	Territorial and environmental diagnosis[7.5h+22.5h] (2.5 credits) (in French)	Pierre Defourny, Freddy Devillez, Frédéric Gaspart
BIRE2203	Integrated project in environmental science and technology[60h] (5 credits) (in French)	Tomas Avella y Shaw, Charles Bielders, Pierre Defourny, Bruno Delvaux, Freddy Devillez, Joseph Dufey, Quentin Ponette, Philippe Sonnet (coord.), Marnik Vanclooster
AGRO2300	Questions in religious sciences[15h] (2 credits) (in French)	Henri Wattiaux
BIRE2200	Mémoire de fin d'études(35 credits) (in French)	N.

Courses specific to the different specialisations

S4E : Environmental Technologies : Water, Soil, Air

BRES2101	Electronics and measurement[30h+22.5h] (4 credits) (in French)	Francis Labrique

This course is followed exceptionally during the academic year 2005-06 by the BIR23/4E students

BRTE2201	Human and animal toxicology[22.5h] (2 credits) (in French)	Alfred Bernard

Choice of two courses from the following list for 4 credits :

AMCO2191	Geoenvironment[30h+15h] (4 credits) (in French)	Alain Holeyman
AMCO2191B	Géoenvironnement(1.5 credits) (in French)	Alain Holeyman

The AMCO 2191 course, Partim B, can only be followed after the BRES2102 course :Soil Hydrodynamics : Modelling

BRES2102	Soil hydrodynamics : modelling[30h+30h] (5 credits) (in French)	Charles Bielders, Marnik Vanclooster
MAPR2643	Treatment of liquid effluents[30h+7.5h] (4 credits) (in French)	Spyridon Agathos, Léon Duvivier
MAPR2680	Treatments of gaseous wastes[30h+7.5h] (4 credits) (in French)	Jacques Devaux, Olivier Françoisse
MAPR2690	Valorisation and Treatment of Solid Wastes[30h+7.5h] (4 credits) (in French)	Jacques Devaux, Joris Proost

Free choice of courses for a volume of 8 credits

This volume is modulable, depending on the choice of the given options.

S5E : Territory Reorganisation

AMCO3011A	Acteurs, territoires et contextes de développement A[30h] (3 credits) (in French)	Bernard Declève
BRES2201B	Irrigation, drainage et conservation des sols:Conservation des sols[15h+7.5h] (2 credits) (in French)	Charles Bielders
BRAT2201	Seminars and exercises in land development[22.5h] (2 credits) (in French)	Pierre Defourny, Freddy Devillez

Choice of courses from the following list for 2.5 credits :

BRAT2102	Spatial modelling of territorial dynamics[15h+15h] (2.5 credits) (in French)	Pierre Defourny

This course will be followed exceptionally in 2005-06

BRAI2212	Rural development economy[30h] (2.5 credits) (in French)	Frédéric Gaspart, Bruno Henry de Frahan

This course choice is not offered in 2005-06. The students will exceptionally follow the BRAT 2102 course.

BIRA2103	Economy and management of agricultural production[30h+7.5h] (3 credits) (in French)	Jean-Marie Bouquiaux
AMCO2991	Faisabilité et incidence des projets de développement territorial[30h] (3 credits) (in French)	Dominique Peeters

Free choice of courses for a volume of 5 credits

This volume is modulable, depending on the choice of the given options.

S6E : Nature, Water and Forests

BREF2202	Forest management and economy[60h] (5 credits) (in French)	Daniel Bemelmans, Jean-Louis Blanchez, Quentin Ponette
BREF2107C	Sylviculture : Séminaires et tournée forestière(3 credits) (in French)	Tomas Avella y Shaw, Jean-Louis Blanchez, Freddy Devillez, Quentin Ponette

BREF2203	Wood transformation and valorisation[30h] (2.5 credits) (in French)	Tomas Avella y Shaw

Choice of one course from the following list :

BRAI2204	Management of temperate and tropical pastoral systems[30h] (2.5 credits) (in French)	Alain Peeters
BREF2201	Management principles of animal species in natural environment[15h+15h] (2.5 credits) (in French)	Michel Baguette, Eric Le Boulengé

Free choice of courses for a volume of 4 credits

This volume is modulable, depending on the choice of the given options.

S7E : Water and Soil Resources

BRES2101	Electronics and measurement[30h+22.5h] (4 credits) (in French)	Francis Labrique

This course is followed exceptionally during the academic year 2005-06 by the BIR23/7E students

BRES2201	Irrigation, drainage and soil preservation[37.5h+22.5h] (5 credits) (in French)	Charles Bielders, Guido Wyseure
BRES2202	Seminars on water and soil resources[22.5h] (2 credits) (in French)	Charles Bielders, Bruno Delvaux, Marnik Vanclooster

Choice of courses from the following list for 3 credits :

BRES2203	Soil management and planning in warm regions[22.5h+15h] (3 credits) (in French)	Charles Bielders, Bruno Delvaux
BRES2204	Integrated management of water resources[22.5h+15h] (3 credits) (in French)	Amaury Tilmant
BRES2205	Clay and solid constructions[22.5h+22.5h] (4 credits) (in French)	Sébastien Lambot

Free choice of courses for a volume of 4.5 credits

This volume is modulable, depending on the choice of the given options.

S10E : Technologies and Information Management

BRES2101	Electronics and measurement[30h+22.5h] (4 credits) (in French)	Francis Labrique

This course is followed exceptionally during the academic year 2005-06 by the BIR23/10E students

BRTI2102	Process modelling and forecasting systems[22.5h+15h] (3 credits) (in French)	Philippe Baret, Patrick Bogaert, Xavier Draye (coord.)
BRTI2202	Special questions in information management[37.5h] (3 credits) (in French)	Philippe Baret, Pierre Defourny

Choice of given courses for a volume of 9 credits

The students are invited to choose specific thematic modules from among : "Biology and Genetics", "Information and Agriculture", "Environmental Evaluation and Follow-up", for this volume of 9 credits. The content of these modules will be defined together with the study advisor.

Free choice of courses for a volume of 2.5 credits

Evaluation

The evaluation focuses on the totality of the theoretical and practical activities.

Positioning of the degree within the University cursus

The university degree in Bioengineering entitles direct access to professional life. It may also grant access to the master's cycle and PhD programme.