

# Master in Chemistry and Bio-industries Bioengineering

## Focus Professional

The Master is focused on life sciences and biotechnology which have an important role to play in line with trends in society. The Master course programme enables students to control biotechnology and bioinformatic tools suitable for creating and producing in agribusiness, chemistry or pharmaceutical industry. From lab to large-industrial scale, working with single living cell as well as whole populations, students can manage complex issues in various industrial sectors.

The first year of the Master consists in two mains axes : "Science and technology" and "Engineering science". During the second year, the training programme plans professionalisation. Students can acquire work experience through periods spent in academic laboratory or companies (company visits and internship).











The Master diploma in Bioengineering Sciences gives access to undertake doctoral studies.

## Bloc 1 | M-IRBCS | MA-IRBC

### Module Chimie et biologie

- BING-F4002 **Acquisition et analyse de données** | Marius GILBERT (Coordinator) and Marc DUFRENE  
 5 credits [lecture: 24h, tutorial classes: 36h]  first term  French
- BING-F4007 **Compléments de biochimie et de microbiologie** | Sigrid FLAHAUT (Coordinator) and Nausicaa NORET  
 5 credits [lecture: 48h, practical work: 12h]  second term  French
- BIOL-F412 **Biotechnologies animales et végétales** | Nathalie VERBRUGGEN (Coordinator) and Benoît VANHOLLEBEKE  
 5 credits [lecture: 36h, project: 24h]  second term  French
- BMOL-F5001 **Physiologie cellulaire et biologie moléculaire du gène** | Véronique KRUYIS (Coordinator), Bruno ANDRE, Cyril GUEYDAN and Maud MARTIN  
 5 credits [lecture: 48h]  first term  French
- CHIM-F4002 **Cinétique chimique, catalyse enzymatique et macromolécules biologiques** | Geneviève DUPONT (Coordinator), Cédric GOVAERTS and Vincent RAUSSENS  
 5 credits [lecture: 48h, tutorial classes: 12h]  first term  French

### Module Ingénierie

- BING-H4000 **Modeling and control of dynamical systems in bioengineering** | Philippe BOGAERTS (Coordinator) and Didier GONZE  
 5 credits [lecture: 48h, tutorial classes: 12h]  second term  English
- BING-H4003 **Unit operations and processes for the environment and bio-industries** | Benoît HAUT (Coordinator), Frédéric DEBASTE and Benoît SCHEID  
 10 credits [lecture: 36h, tutorial classes: 48h, practical work: 36h]  second term  English
- BING-H5000 **Introduction à la bioinformatique et à ses applications** | Dimitri GILIS (Coordinator) and Fabrizio PUCCI  
 5 credits [lecture: 36h, practical work: 24h]  first term  French
- CHIM-H413 **Chemical and biological reactor design** | Frédéric DEBASTE (Coordinator) and David CANNELLA  
 5 credits [lecture: 30h, tutorial classes: 18h, practical work: 12h]  first term  English
- MATH-H304 **Automatique** | Michel KINNAERT (Coordinator)  
 5 credits [lecture: 30h, practical work: 30h]  second term  French

### Cours à option

A total of five credits chosen from the following

BING-H505  
(optional)

[Fundamentals of biomaterials](#) | Mohammadamin SHAVANDI (Coordinator)

5 credits [lecture: 36h]  second term  English

BMOL-F457  
(optional)

[Travaux pratiques de biologie cellulaire](#) | Maud MARTIN (Coordinator), Guillaume OLDENHOVE and David PEREZ-MORGA

5 credits [practical work: 48h]  second term  French



# Master in Chemistry and Bio-industries Bioengineering

Focus Professional

## Bloc 2 | M-IRBCS | MA-IRBC

### Cours obligatoires

- MEMO-F514 **Mémoire** | Philippe BOGAERTS (Coordinator)  
 25 credits [mfe/tfe: 300h] first and second terms
- STAG-F014 **Stage en entreprise en chimie et bio-industries** | Sigrid FLAHAUT (Coordinator)  
 15 credits [work placement: 180h] first term French

### Module à choisir

#### Module Bioinformatique

A total of 15 credits chosen from the following

- BINF-F401 **Computational Methods for Functional Genomics** | Vincent DETOURS (Coordinator)  
 (optional) 5 credits [lecture: 36h, practical work: 24h] second term
- BINF-F405 **Biophysics and structural bioinformatics II** | Dimitri GILIS (Coordinator), Fabrizio PUCCI and Wim VRANKEN  
 (optional) 5 credits [lecture: 36h, practical work: 24h] second term
- CHIM-F4001 **Rational drug design and PKPD modeling** | Jean-Christophe LELOUP (Coordinator) and Martine PREVOST  
 (optional) 5 credits [lecture: 36h, tutorial classes: 12h, project: 24h] second term English
- CHIM-F422 **Modélisation des rythmes du vivant** | Didier GONZE (Coordinator), Geneviève DUPONT and Jean-Christophe LELOUP  
 (optional) 5 credits [lecture: 24h, tutorial classes: 24h, project: 30h] second term French
- CHIM-F443 **Approches computationnelles des états de la matière** | Nathalie VAECK (Coordinator), Emilie CAUET and Martine PREVOST  
 (optional) 5 credits [practical work: 36h, project: 24h] first term French
- INFO-F438 **Algorithms in computational biology** | John IACONO (Coordinator)  
 (optional) 5 credits [lecture: 24h, tutorial classes: 12h, project: 60h] second term English
- INFO-H410 **Techniques of artificial intelligence** | Hugues BERSINI (Coordinator)  
 (optional) 5 credits [lecture: 24h, tutorial classes: 12h] second term English
- PHYS-F512 **Molecular motors and stochastic processes** | Pierre GASPARD (Coordinator)  
 (optional) 5 credits [lecture: 36h, tutorial classes: 24h] first term English

#### Module biotechnologies moléculaire et cellulaire

A total of 15 credits chosen from the following

- BIME-H407 **Introduction to medical imaging and optical microscopy** | Olivier DEBEIR (Coordinator) and Simon-Pierre GORZA  
 (optional) 5 credits [lecture: 48h, tutorial classes: 12h] first term English
- BING-H5001 **Biorefinery: from biomass transformation to biobased products** | David CANNELLA (Coordinator)  
 (optional) 5 credits [lecture: 36h, practical work: 24h] first term English

BING-H507 (optional)	<b>Molecular and biomolecular engineering</b>   Gilles BRUYLANTS (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 12h] 📅 second term 🗨 English
BMOL-F006 (optional)	<b>Microbiologie moléculaire</b>   Carine VAN LINT (Coordinator), Mélanie BOECKSTAENS, Abel GARCIA-PINO, Dukas Jurénas, Anna Maria MARINI and Laurence VAN MELDEREN ⌚ 5 credits [lecture: 40h, tutorial classes: 12h] 📅 second term 🗨 French
BMOL-F417 (optional)	<b>Communication inter-cellulaire (signalisation/intégration des signaux)</b>   Benoît VANHOLLEBEKE (Coordinator) and Bernard ROBAYE ⌚ 5 credits [lecture: 28h, seminars: 8h] 📅 first term 🗨 French
BMOL-F418 (optional)	<b>Immunologie et biologie du cancer</b>   Etienne MEYLAN (Coordinator), Fabienne ANDRIS and Stanislas GORIELY ⌚ 5 credits [lecture: 40h] 📅 second term 🗨 French
BMOL-F420 (optional)	<b>Relations hôtes-vecteurs-parasites: notions approfondies</b>   Sabrina BOUSBATA (Coordinator) and Luc VANHAMME ⌚ 5 credits [lecture: 36h, practical work: 24h] 📅 second term 🗨 French
CHIM-F422 (optional)	<b>Modélisation des rythmes du vivant</b>   Didier GONZE (Coordinator), Geneviève DUPONT and Jean-Christophe LELOUP ⌚ 5 credits [lecture: 24h, tutorial classes: 24h, project: 30h] 📅 second term 🗨 French
CHIM-H407 (optional)	<b>Molecular structural characterization and analysis</b>   Gilles BRUYLANTS (Coordinator) and Sebastiaan EELTINK ⌚ 5 credits [lecture: 36h, tutorial classes: 12h, practical work: 12h] 📅 second term 🗨 English

## Module biotechnologie agro-alimentaire

*A total of 15 credits chosen from the following*

BING-F5002 (optional)	<b>Contrôle des fabrications alimentaires et législation des entreprises</b>   Sigrid FLAHAUT (Coordinator) and Philippe MAURER ⌚ 5 credits [lecture: 36h, project: 24h] 📅 first term 🗨 French
BING-F502 (optional)	<b>Principales filières agroalimentaires et valorisation de molécules d'intérêt d'origine alimentaire</b>   Christophe BLECKER (Coordinator), Sigrid FLAHAUT and Caroline STEVIGNY ⌚ 5 credits [lecture: 24h, practical work: 12h, project: 30h] 📅 first term 🗨 French
BING-F504 (optional)	<b>Nutrition animale et humaine</b>   Joanne RASSCHAERT (Coordinator) and Carine DE VRIESE ⌚ 5 credits [lecture: 48h] 📅 second term 🗨 French
BING-F530 (optional)	<b>Brasserie: contrôle de fabrication des matières premières au produit fini</b>   Laurence VAN NEDERVELDE (Coordinator) ⌚ 5 credits [lecture: 36h, practical work: 24h] 📅 first term 🗨 French
GEST-H501 (optional)	<b>Logistics Engineering and Management</b>   Alassane Ballé NDIAYE (Coordinator) ⌚ 5 credits [lecture: 12h, tutorial classes: 36h] 📅 first term 🗨 English

## Autre UE

Choisir 5 crédits dans les programmes de masters de l'Ecole interfacultaire de Bioingénieurs, de la Faculté des Sciences, de l'Ecole Polytechnique de Bruxelles ou dans le programme des masters bioingénieurs de la Faculté des Bioingénieurs de l'Université Catholique de Louvain (UCL)

*A total of five credits chosen from the following*

TEMP-0000 (optional)	<b>Cours extérieurs au programme</b> ⌚ 5 credits 📅 academic year 🗨 French
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