

**At Louvain-la-Neuve - 60 credits - 1 year - Day schedule - In English**Dissertation/Graduation Project : **YES** - Internship : **NO**Activities in English: **NO** - Activities in other languages : **NO**Activities on other sites : **NO**Main study domain : **Sciences**Organized by: **Faculty of Science (SC)**Programme acronym: **BIOL2M1** - Francophone Certification Framework: 7**Table of contents**

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## BIOL2M1 - Introduction

### Introduction

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#### **Introduction**

This master's degree aims to train "generalist" biologists capable of understanding the scientific foundations of the functioning of living organisms.

#### **Your future job**

Biologists apply their knowledge and know-how, which are very versatile, in very different sectors: in scientific, fundamental or applied research in research institutes or private laboratories, in expertise and resource management in the private or public sector, in education, training and communication.

#### **Your programme**

The knowledge to be acquired is at two levels of complexity of living organisms: "biochemistry, molecular and cellular biology" on the one hand, and "biology of organisms and ecology" on the other hand, identified by two options. The programme consists mainly of activities borrowed from the first year of the Masters (120 credits) of the same name.

## BIOL2M1 - Teaching profile

### Learning outcomes

The Master in Biology (60 credits) is designed to train "generalist" biologists who can grasp the scientific foundations of how living organisms work. The knowledge they will acquire involves two different levels in the complexity of living organisms which also relate to two option courses: first, biochemistry, molecular and cellular biology, then biology of organisms and ecology. The programme is mostly made up of activities borrowed from the first year of the Master (120 credits) of the same name.

On successful completion of this programme, each student is able to :

1. Mettre en œuvre une approche intégrative des processus fondamentaux régissant le vivant depuis la structure des cellules vivantes et de leurs composants moléculaires jusqu'à leur fonctionnement au sein d'un individu ou au fonctionnement et à l'évolution des populations et des écosystèmes, en fonction de l'option choisie.

1.1 témoigner d'une maîtrise des savoirs dans les domaines développés dans l'option choisie, à savoir

- en biochimie, biologie moléculaire et cellulaire,
- ou en biologie des organismes et écologie.

1.2 décrire, expliquer, synthétiser et discuter

1.2.1 la structure et le fonctionnement des cellules vivantes et de leurs composants moléculaires ou

1.2.2 la diversité et l'évolution biologique, l'écologie des populations, des communautés et écosystèmes, l'autécologie, l'écophysiologie et l'écotoxicologie.

2. Répondre, de manière innovante, à une question inédite de biologie en utilisant des sources d'information appropriées

2.1 intégrer et articuler des concepts théoriques pour comprendre des problématiques variées.

2.2 utiliser et appliquer ces concepts afin d'analyser la valeur scientifique des sources pour donner un avis critique et raisonné.

3. Mettre en œuvre de manière autonome une démarche scientifique pour répondre à une question inédite dans un domaine, et/ou à l'interface de plusieurs domaines de la biologie

3.1 formuler une question scientifique, émettre des hypothèses, programmer et réaliser les expérimentations appropriées, analyser et interpréter les résultats, afin d'objectiver et de conclure,

3.2 mobiliser un savoir-faire technique afin de réaliser des expérimentations avec toute la rigueur scientifique.

4. Communiquer des connaissances scientifiques de base ou spécialisées en français et en anglais

4.1 maîtriser et utiliser les techniques de présentation formelle (poster, diaporama...),

4.2 structurer, rédiger et exposer des idées et concepts scientifiques à des spécialistes comme à des non-spécialistes,

4.3 argumenter et justifier des hypothèses et des données afin de les défendre devant un public de professionnels scientifiques.

5. S'instruire et agir de manière autonome dans une perspective collaborative

5.1. participer activement à une réunion d'équipe en partageant ses idées, ses expériences et ses connaissances,

5.2. écouter les autres, échanger et arriver à un consensus,

5.3. réaliser, en équipe, des recherches ou d'autres types de projets, en répartissant les tâches et les responsabilités,

5.4. préparer une présentation écrite ou orale en collaboration, en combinant les informations apportées par les membres de l'équipe.

6. Agir en scientifique conscient de lui-même et du monde et en universitaire responsable

6.1 mettre en perspective de manière critique l'impact des sciences et des techniques sur l'évolution des sociétés,

6.2 évaluer les enjeux éthiques et sociétaux des nouvelles technologies et des pratiques expérimentales en biologie,

6.3 reconnaître la fraude scientifique et le plagiat comme des comportements inacceptables en sciences.

### Programme structure

The program consists in 20 credits of core courses, an option of 22 or 24 credits and selected courses to complete the program.

> [Core courses](#) [ en-prog-2020-biol2m1-tronc\_commun ]

> [List of electives](#) [ en-prog-2020-biol2m1-options ]

> [Option in Biochemistry, Molecular and Cellular Biology](#) [ en-prog-2020-biol2m1-lbiol210o ]

> [Option in biology of organisms and ecology](#) [ en-prog-2020-biol2m1-lbiol211o ]

> [Cours au choix](#) [ en-prog-2020-biol2m1-lbiol212o ]

Preparatory Module (only for students who qualify for the course via complementary coursework)

> [Master \[60\] in Biology](#) [ en-prog-2020-biol2m1-module\_complementaire ]

## BIOL2M1 Detailed programme

### Programme by subject

#### CORE COURSES [30.0]

○ Mandatory

△ Courses not taught during 2020-2021

⊕ Periodic courses taught during 2020-2021

⊗ Optional

⊖ Periodic courses not taught during 2020-2021

■ Activity with requisites

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

#### ○ Travail de fin d'études (18 credits)

○ LBIOL2990	Mémoire			18 Credits	
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#### ○ Philosophie, éthique (2 credits)

2 crédits à choisir parmi

⊗ LSC2001	Introduction to contemporary philosophy	Peter Verdée	30h	2 Credits	q2
⊗ LSC2220	Philosophy of science	Peter Verdée (compensates Alexandre Guay)	30h	2 Credits	q2
⊗ LFILO2003E	Ethics in the Sciences and technics (sem)		15h+15h	2 Credits	q2
⊗ LTHEO2840	Science and Christian faith	Benoît Bourguine (coord.) Dominique Lambert	15h	2 Credits	q1
⊗ ESSPS2101	Science, ethics and development		22.5h+7.5h	3 Credits	q1

#### ⊗ Optional courses

These credits are not counted within the 60 required credits.

⊗ LSST1001	IngénieuxSud	Jean-Pierre Raskin	15h+45h	5 Credits	q1+q2
⊗ LSST1002M	Information and critical thinking - MOOC	Myriam De Kesel Jim Plumet Jean-François Rees	30h+15h	3 Credits	q2

**OPTIONS**

The option in Biochemistry, Molecular and Cellular Biology is fully taught in English.

The option in biology of organisms and ecology is mainly taught in French.

The student chooses an option and completes his or her program with a elective subjects.

- > [Option in Biochemistry, Molecular and Cellular Biology](#) [ en-prog-2020-biol2m1-lbiol210o ]
- > [Option in biology of organisms and ecology](#) [ en-prog-2020-biol2m1-lbiol211o ]
- > [Cours au choix](#) [ en-prog-2020-biol2m1-lbiol212o ]

**OPTION IN BIOCHEMISTRY, MOLECULAR AND CELLULAR BIOLOGY [24.0]**

● Mandatory

△ Courses not taught during 2020-2021

⊕ Periodic courses taught during 2020-2021

⊗ Optional

⊖ Periodic courses not taught during 2020-2021

■ Activity with requisites

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

**o Content:****o Cours obligatoires (11 credits)**

● LBBMC2101	<a href="#">Structural and functional biochemistry</a>	Pierre Morsomme Patrice Soumilion	36h+6h	4 Credits	q1
● LBBMC2102	<a href="#">Integrated molecular and cellular biology</a>	Henri Batoko Bernard Hallet Pierre Morsomme Melissa Page (compensates René Rezsöházy)	30h	3 Credits	q1
● LBRMC2201	<a href="#">Bioinformatics : DNA and protein sequences</a>	Michel Ghislain	30h+15h	4 Credits	q1

**o Techniques de biochimie et de biologie moléculaire (3 credits)**

L'étudiant-e choisit une UE parmi :

Minimum 3 credits

⊗ LBIRC2101	<a href="#">Biochemical analysis</a>	Pierre Morsomme (coord.)	22.5h+30h	4 Credits	q1
⊗ LBRMC2101	<a href="#">Genetic engineering</a>	François Chaumont (coord.) Charles Hachez Melissa Page (compensates François Chaumont)	37.5h+15h	5 Credits	q1
⊗ LBRMC2202	<a href="#">Cell culture technology</a>	David Alsteens Charles Hachez (coord.) Pascal Hols	30h	3 Credits	q1

**o UE au choix (10 credits)**

L'étudiant-e choisit 2 UE parmi :

⊗ LBBMC2104	<a href="#">Animal physiological biochemistry</a>	Pierre Morsomme Melissa Page	36h+18h	5 Credits	q2
⊗ LBBMC2105	<a href="#">Protein engineering and directed evolution</a>	Pierre Morsomme Patrice Soumilion	36h+18h	5 Credits	q2
⊗ LBBMC2106	<a href="#">Molecular genetics and microbial genomics</a>	Bernard Hallet Pascal Hols	36h+18h	5 Credits	q2
⊗ LBBMC2107	<a href="#">Microbial cellular physiology</a>	Stephan Declerck Michel Ghislain Bernard Hallet Pascal Hols Pierre Morsomme	36h+18h	5 Credits	q2

⌘ LBBMC2108	Molecular genetics and plant genomics	Henri Batoko Xavier Draye Charles Hachez (compensates François Chaumont)	36h+18h	5 Credits	q2
⌘ LBBMC2109	Plant cell physiology	Henri Batoko Charles Hachez Pierre Morsomme (compensates François Chaumont)	36h+18h	5 Credits	q2
⌘ LBBMC2110	Animal and human molecular genetics and genomics	Françoise Gofflot Nisha Limaye (compensates Bernard Knoops) René Rezsöházy	36h+18h	5 Credits	q2
⌘ LBBMC2111	Animal and human cellular physiology	Patrick Dumont Bernard Knoops	36h+18h	5 Credits	q2

**OPTION IN BIOLOGY OF ORGANISMS AND ECOLOGY [22.0]**

● Mandatory

△ Courses not taught during 2020-2021

⊕ Periodic courses taught during 2020-2021

⊗ Optional

⊖ Periodic courses not taught during 2020-2021

■ Activity with requisites

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

**o Content:****o Cours obligatoires (14 credits)**

● ESBOE2108	Field training in aquatic ecology		0h+45h	2 Credits	q2
● LBOE2109	Field training in terrestrial ecology	Thierry Hance Renate Wesselingh	0h+45h	2 Credits	q2
● LBOE2111	Evolution	Jean-Paul Dehoux Thierry Hance Caroline Nieberding (coord.) Patrice Soumillon (compensates René Rezsöházy) Karine Van Doninck Renate Wesselingh	54h	5 Credits	q1
● LBOE2112	Biological data analysis	Johan Segers	24h+36h	5 Credits	q1

**o Modules au choix (16 credits)**

L'étudiant-e choisit 1 module parmi :

**⊗ Ecotoxicology**

● ESBOE2163	Ecotoxicology (UNamur)		24h+24h	4 Credits	q1
● ESBOE2162	Ecotoxicology of populations, communities and ecosystems		12h+12h	2 Credits	q1
● ESBOE2238	Applied ecotoxicology (UNamur)		24h	2 Credits	q1

**⊗ Molecular ecology**

● LBOE2124	Molecular ecology	Caroline Nieberding Karine Van Doninck	36h+56h	8 Credits	q2 ⊖
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**⊗ Functional genomics**

● LBOE2165	Evolutionary genomics and transcriptomics	Melissa Page	30h+18h	4 Credits	q2 ⊕
● ESBOE2166	Ecological proteomics and epigenetics		30h+18h	4 Credits	q2

**⊗ Biologie de la conservation et de la restauration**

● LBOE2120	Conservation de la biodiversité	Nicolas Schtickzelle	36h+12h	4 Credits	q1
● LBOE2125	Biodiversity and humans	Charles-Hubert Born Thierry Hance Charles Pence	24h	2 Credits	q1
● LBOE2141	Ecologie de la restauration	Nicolas Schtickzelle (compensates Hans Van Dyck)	12h+12h	2 Credits	q1

**⊗ Ecologie spatiale**

● LGEO1342A	Systèmes d'information géographique (SIG) : partim	Sophie Vanwambeke	24h+24h	4 Credits	q1
● LBOE2140	Landscape ecology	Hans Van Dyck	24h+24h	4 Credits	q1 △

**⊗ Ecologie des interactions**

● LBOE2160	Ecologie des interactions	Thierry Hance Anne-Laure Jacquemart	24h	2 Credits	q1
● LBOE2161	Ecologie comportementale	Thierry Hance (compensates Hans Van Dyck) Kévin Tougeron (compensates Hans Van Dyck) Bertanne Visser (compensates Hans Van Dyck)	24h+12h	3 Credits	q1

○ LBOE2168	Interactions plantes-environnement	Stanley Lutts Muriel Quinet	24h+12h	3 Credits	q1
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#### ✂ Ecologie et gestion des milieux aquatiques et dulcicoles

○ ESBOE2123	Freshwater Biodiversity (UNamur)		12h+24h	3 Credits	q1
○ ESBOE2142	Ecology of natural and disturbed aquatic environments (UNamur)		12h+20h	2 Credits	q1
○ ESBOE2144	Resource management in fisheries and aquaculture		18h+12h	3 Credits	q1

#### ✂ Ecologie appliquée

○ LBIRF2104A	Ecologie et santé des forêts - Phytosociologie	Claude Bragard Anne Legrève Quentin Ponette Caroline Vincke	15h	3 Credits	q2
○ LBOE2166	Lutte biologique	Claude Bragard Thierry Hance	12h+24h	3 Credits	q2
○ LBOE2185	Evolutionary applications	Alok Arun (compensates Hans Van Dyck) Renate Wesselingh (compensates Hans Van Dyck)	20h	2 Credits	q2



## COURS AU CHOIX

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● Mandatory

△ Courses not taught during 2020-2021

⊕ Periodic courses taught during 2020-2021

⊗ Optional

⊖ Periodic courses not taught during 2020-2021

■ Activity with requisites

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

### ○ Content:

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#### ⊗ Autres cours au choix

L'étudiant-e peut compléter son programme avec des UE choisies dans la liste des cours du master 120 BOE et du master 120 BBMC à l'exception des cours des finalités didactiques, de LBOE2197, LBOE2297, LBOE2240, LBOE2241, LBOE2260, LBOE2261, LBOE2292, LBBMC2103, LBBMC2203, LBBMC2205, LBBMC2215, LBBMC2206, LBBMC2997, LBBMC2998 et LBBMC2201

#### ⊗ Activités de mise à niveau

l'étudiant-e peut choisir, en accord avec le conseiller aux études, jusqu'à 6 crédits d'activités de mise à niveau parmi les cours du bachelier et de l'approfondissement en biologie.

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## The programme's courses and learning outcomes

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

## BIOL2M1 - Information

### Access Requirements

*In the event of the divergence between the different linguistic versions of the present conditions, the French version shall prevail*  
*Decree of 7 November 2013 defining the landscape of higher education and the academic organization of studies.*  
*The admission requirements must be met prior to enrolment in the University.*

#### SUMMARY

- > [Specific access requirements](#)
- > [University Bachelors](#)
- > [Non university Bachelors](#)
- > [Holders of a 2nd cycle University degree](#)
- > [Holders of a non-University 2nd cycle degree](#)
- > [Access based on validation of professional experience](#)
- > [Access based on application](#)
- > [Admission and Enrolment Procedures for general registration](#)

### Specific access requirements

Les demandes d'admission sont à introduire auprès du Secrétariat du Département de biologie, Carnoy, Place Croix du Sud 2, 1348 Louvain-la-Neuve.

#### University Bachelors

Diploma	Special Requirements	Access	Remarks
<b>UCLouvain Bachelors</b>			
<a href="#">Bachelor in Biology</a>		Direct access	
<a href="#">Bachelor in Chemistry</a>	Si l'étudiant a suivi la (unknown URL)	Direct access	In some cases, the UCLouvain Enrolment Office, after reviewing their online enrolment or re-enrolment application, will ask the students concerned to provide an enrolment authorisation from the faculty/school.
<a href="#">Bachelor in Bioengineering</a>		Access with additional training	
<b>Others Bachelors of the French speaking Community of Belgium</b>			
Bachelier en sciences biologiques		Direct access	
		Access with additional training	
<b>Bachelors of the Dutch speaking Community of Belgium</b>			
Bachelor in de biochemie en de biotechnologie		Access based on application	
		Access based on application	
<b>Foreign Bachelors</b>			
		Access based on application	

#### Non university Bachelors

> Find out more about [links](https://uclouvain.be/fr/etudier/passerelles) (https://uclouvain.be/fr/etudier/passerelles) to the university

Diploma	Access	Remarks
BA - technologue de laboratoire médical - HE - crédits supplémentaires entre 45 et 60 BA en agronomie (techniques et gestion agricoles) - EPS - crédits supplémentaires entre 45 et 60	Les enseignements supplémentaires éventuels peuvent être consultés dans le <a href="#">module complémentaire</a> .	Type court

BA en agronomie (toutes orientations) - HE - crédits supplémentaires entre 45 et 60

BA en chimie (biochimie, biotechnologie, chimie appliquée) - EPS - crédits supplémentaires entre 45 et 60

BA en chimie (biochimie, biotechnologie, chimie appliquée, environnement) - HE - crédits supplémentaires entre 45 et 60

### Holders of a 2nd cycle University degree

Diploma	Special Requirements	Access	Remarks
"Licenciés"		-	
Masters		-	

### Holders of a non-University 2nd cycle degree

#### Access based on validation of professional experience

> See the website [Valorisation des acquis de l'expérience](#)

It is possible to gain admission to all masters courses via the validation of professional experience procedure.

#### Access based on application

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

Students who wish to be admitted on the basis of a dossier are invited to consult the [criteria for the evaluation of application](#).

#### Admission and Enrolment Procedures for general registration

## Supplementary classes

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**To access this Master, students must have a good command of certain subjects. If this is not the case, they must add supplementary classes at the beginning of their Master's programme in order to obtain the prerequisites for these studies.**

● Mandatory

△ Courses not taught during 2020-2021

⊕ Periodic courses taught during 2020-2021

⊗ Optional

⊖ Periodic courses not taught during 2020-2021

■ Activity with requisites

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

### ○ Enseignements supplémentaires

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## Teaching method

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The teaching strategy takes its inspiration from the idea of "taking responsibility for one's own learning". In the core subjects, students have a choice between a series of activities in human sciences and may choose between many elective subjects. Learning is for the most part centred on individual work (e.g. reading, consultation of databases and bibliographic references, field and laboratory work).

## Evaluation

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***The evaluation methods comply with the regulations concerning studies and exams (<https://uclouvain.be/fr/decouvrir/rgee.html>). 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 will mainly be assessed on the basis of individual work (e.g. reading, consultation of databases and bibliographic references, writing monographs and reports, presentation of seminars, dissertation and field work). As far as possible, there will be continuous assessment, including regular 'open book examinations'. Certain activities will not be given a precise mark but will be officially certified.

## Possible trainings at the end of the programme

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Holders of the Master in Biology with an option course in biochemistry, molecular and cellular biology may go on to the degree of Master in Biochemistry, Molecular and Cellular Biology (120 credits) subject to a further year of training and a more advanced dissertation.

Holders of the Master in Biology with an option course in biology of organisms and ecology may go on to the degree of Master in Biology of Organisms and Ecology (120 credits) subject to a further year of training and a more advanced dissertation.

## Contacts

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### Curriculum Management

#### Entity

Structure entity	SST/SC/BIOL
Denomination	(BIOL)
Faculty	Faculty of Science (SC)
Sector	Sciences and Technology (SST)
Acronym	BIOL
Postal address	Croix du sud 4-5 - bte L7.07.05 1348 Louvain-la-Neuve Tel: +32 (0) 10 47 34 89 - Fax: +32 (0) 10 47 35 15 <a href="https://uclouvain.be/fr/facultes/sc/biol">https://uclouvain.be/fr/facultes/sc/biol</a>
Website	<a href="https://uclouvain.be/fr/facultes/sc/biol">https://uclouvain.be/fr/facultes/sc/biol</a>

#### Other academic Supervisor(s)

- Pierre Morsomme
- Renate Wesselingh

#### Jury

- Henri Batoko
- Charles Hachez
- André Lejeune

#### Useful Contact(s)

- Aloysia Stephenne
- Bernadette Gravy

