

# MSc in Biology

Faculty of Science, University of Neuchâtel

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## An integral and transversal curriculum

The Master of Science in Biology offers a programme that lets students select their area of specialization and acquire a diverse range of transferable skills. This MSc proposes an integrative approach: it begins with a common core of courses covering key topics in biology, with particular emphasis on methodological and quantitative aspects. Students then choose two of the six available specialisations: chemical ecology, ecology and evolution, biodiversity, animal behaviour, conservation biology, and sustainable agriculture.

## Profs. in charge of the curriculum

Prof. Klaus Zuberbühler  
Klaus.Zuberbuehler@unine.ch  
**and**  
Prof. Redouan Bshary  
Redouan.Bshary@unine.ch

## Enquiries

Secretary of the Faculty of Science  
Secretariat.sciences@unine.ch  
+41 32 718 21 00

## Version

Study plan dated 12 May 2023  
Valid for the academic year 2023-2024

## General structure of the programme :

The Master in Biology is a programme given over the span of 2 years and requires 120 ECTS credits to complete. The first semester is dedicated to the core curriculum, whereas the second semester is dedicated to the acquisition of specialisations. Of the six specialisations available in 3 groups, each student must choose two from two different groups. The second year is entirely dedicated to field work and the completion of a Master thesis.

Core curriculum		Specialisations and Master thesis	
Compulsory courses	Elective courses	Group I	Group II
Generic skills	Basics of conservation biology	Sustainable agriculture	Biodiversity
Computer tools	Special skills	Animal behaviour	Ecology and evolution
Seminars	Excursions	Group III	Master thesis (2 <sup>nd</sup> year)
Laboratory and field methods	Internship	Conservation biology	
	Free electives	Chemical ecology	
<b>21 ECTS</b>	<b>15 ECTS</b>	<b>24 ECTS specialization + 60 ECTS Master thesis</b>	

## Core curriculum (compulsory courses)

Modules/courses	Duration	Semester	ECTS	Principal Lecturer	Evaluation
<b>Generic skills module</b>			<b>9</b>		
Statistics	30	A	3	Dr R. Slobodeanu	CA (graded)
Scientific writing	30	A	3	Prof. K. Zuberbühler	CA (graded)
Seminars by externals	28	A and S	3	Dr T. Degen	CA (pass)
<b>Computer tools (choose one)</b>			<b>3</b>		
Bioinformatic tools	30	A	3	Prof. D. Croll	CA (graded)
Models and parameter estimation	30	A	3	Prof. J. Koella	CA (graded)
<b>Seminars module (choose two)</b>			<b>6</b>		
Ecology and sustainability	30	A	3	Prof. J. Vermeer	CA (graded)
Ecology and evolution	30	A	3	Prof. K. Zuberbühler	CA (graded)
Ecology and biodiversity	30	A	3	Prof. D. Croll	CA (graded)
<b>Laboratory methods (choose one)</b>			<b>3</b>		
Molecular methods	7 hd	A	3	Dr S. Venkatasalam	CA (graded)
Natural substances analyses	7 hd	A	3	Prof. S. Von Reuss and Prof. G. Roeder	CA (graded)
<b>Total ECTS Core compulsory courses</b>			<b>21</b>		

## Core curriculum (elective courses)

Modules/courses	Duration	Semester	ECTS	Principal Lecturer	Evaluation
<b>Basics of Conservation biology</b>			<b>3-12</b>		
Methods in biodiversity monitoring	28	A	3	Dr C. Praz	Written, 1 hour
Animal conservation	30	A	3	Dr C. Praz (info fauna)	CA (graded)
Biodiversity and agriculture: a transdisciplinary perspective	28	S	3	Prof. A. Aebi	CA (graded)
Plant systematics and evolution	30	S	3	Prof. J. Grant	CA (graded)
<b>Special skills</b>			<b>3-15</b>		
Introduction to geomatics for biodiversity conservation	28	A	3	Dr S. Boillat	CA (graded)
Microscopy	7 hd	A	3	Dr O. Sereda (CSEM)	CA (graded)
Directed readings : First steps in natural or social sciences	28	A	3	Prof. A. Aebi	CA (graded)
Advanced geomatics for biodiversity conservation	28	S	3	Dr S. Boillat	CA (graded)
Non-validated compulsory course of the core curriculum			max. 3		CA (graded)
<b>Excursion (choose one max.)</b>			<b>max. 3</b>		
EXC Tropical ecology	7 d	S	3	Prof. B. Benrey	CA (pass)
EXC Marine biology	7 d	S	3	Prof. R. Bshary	CA (pass)
EXC Mediterranean ecology	7 d	S	3	Prof. W. Mueller	CA (pass)
EXC Alpine ecology	7 d	S	3	Prof. S. Rasmann Dr. S. Bindschedler Prof. J. Grant	CA (pass)
<b>Internship (see remarks)</b>			<b>6</b>		
Approved by course controller	160	A or S	6	Prof. K. Zuberbühler	CA (pass)
<b>Free electives (see remarks)</b>			<b>max. 12</b>		
Approved by course controller		A or S	max. 12		
<b>Total ECTS Core elective courses</b>			<b>15</b>		

## Specialisations (see remarks)

Modules/courses	Duration	Semester	ECTS	Principal Lecturer	Evaluation
<b>Group I</b>					
<b>Sustainable agriculture module</b>			<b>12</b>		
Integrated pest management (course + workshop)	40	S	4	Profs. T. Turlings	CA (graded)
Plant domestication and insect interactions	20	S	2	Prof. B. Benrey	CA (graded)
Microbial ecology	30	S	3	Prof. P. Junier and Dr. S. Bindschedler	CA (graded)
Plant pathology	30	S	3	Dr T. Badet	CA (graded)
<b>Animal behaviour module</b>			<b>12</b>		
An integrative approach to animal behaviour	28	S	3	Prof. R. Bshary	CA (graded)
Animal behaviour research	28	S	3	Prof. K. Zuberbühler	CA (graded)
Behavioural ecology	28	S	3	Prof. R. Bshary	CA (graded)
Comparative cognition	28	S	3	Prof. K. Zuberbühler	CA (graded)
<b>Group II</b>					
<b>Biodiversity module</b>			<b>12</b>		
Soil biodiversity	28	S	3	Prof. E. Mitchell	CA (graded)
Genomics of biodiversity	28	S	3	Prof. K. Lucek	CA (graded)
Natural ecosystems of Switzerland	28	S	3	Dr S. Ursenbacher (info fauna)	CA (graded)
Biodiversity data analysis	28	S	3	Dr E. Defossez	CA (graded)
<b>Ecology and evolution module</b>			<b>12</b>		
Ecological interactions	30	S	3	Prof. B. Benrey	CA (graded)
Evolutionary parasitology	30	S	3	Prof. J. Koella	CA (graded)
Evolutionary ecology	30	S	3	Prof. D. Croll	CA (graded)
Methods in evolutionary ecology	30	S	3	Prof. J. Koella	CA (graded)

## Specializations and Master thesis (see remarks)

Modules/courses	Duration	Semester	ECTS	Principal Lecturer	Evaluation
<b>Group III</b>					
<b>Conservation biology module</b>			<b>12</b>		
Evidence-based conservation of species and habitats	30	S	3	Dr C. Praz	CA (graded)
Evidence-based conservation of ecosystems	30	S	3	Prof. C. Zemp	CA (graded)
Plant and ecosystem conservation	30	S	3	Prof. S. Rasmann	CA (graded)
Faunistic methods	3 d	S	3	Dr B. Schmidt (info fauna)	CA (graded)
<b>Chemical ecology module</b>			<b>12</b>		
Basics of chemical ecology (+labs)	7 hd	S	2	Profs. T. Turlings and G. Roeder	Written, 1 hour
Biosynthesis and function of secondary compounds	7 hd	S	2	Profs. J. Vermeer and F. Kessler	CA (graded)
Recent advances in chemical ecology	7 hd	S	2	Prof. T. Turlings	CA (graded)
Plant molecular genetics (+labs)	7 hd	S	3	Prof. J. Vermeer	CA (graded)
Natural products chemistry (+labs)	7 hd	S	3	Prof. S. Von Reuss	CA (graded)
<b>Total ECTS Specializations</b>			<b>24</b>		
<b>Master thesis</b>			<b>60</b>		
Master thesis		A and S	60		CA (graded)
<b>Total ECTS MSc in Biology</b>			<b>120</b>		

## Complementary information

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### Evaluations and regulations

- Course and exam registration in IS-Academia is compulsory for course validation.
- For details regarding Faculty regulations, please consult the *Règlement d'études et d'examens de la Faculté des sciences* and existing directives on the Faculty's webpage ([www.unine.ch/sciences](http://www.unine.ch/sciences)).
- Continuous assessment evaluations (pass or graded) are specified in the corresponding course description.
- Elective courses must be validated with a sufficient mark (4.0) and cannot be compensated.
- When an evaluation of a course chosen from the modules **Computer tools**, **Seminars** and **Laboratory and field methods** is failed and not compensated after a second attempt, students have the option to choose another course of the same module until all choices are exhausted.

### Abbreviations and grades

<b>labs</b>	= laboratory work
<b>EXE</b>	= exercises
<b>EXC</b>	= excursions
<b>CA</b>	= continuous assessment
<b>hd</b>	= half-days
<b>d</b>	= days
<b>N.N.</b>	= teacher to be designated
<b>A</b>	= autumn semester
<b>S</b>	= spring semester

### Remarks

- **Specializations** : Students must choose two specializations from two different groups.
- **Master thesis** : Must be supervised by a professor of the Institute of Biology.
- **Internship** : Students can validate an approx. 4 week internship for 6 ECTS credits during their Master program. For all related details, please contact Prof. K. Zuberbühler.
- **Free electives** : Up to 12 ECTS credits can be validated as free electives. Courses must be pre-approved by the prof. in charge of the curriculum. In addition, they must be Master level courses and in relation to the field of Biology.
- **Excursions** : Available space may be limited (not possible for external students).

### Transitional provisions for Conservation biology specialisation module

Students who followed all courses of this specialization before 2023-24 must be examined on the earlier content as mentioned by the previous program (2022-23).

For students who have started this specialization and have not followed its full content in 2022-23 (or before), an analysis will be carried out by the Dean's Office at the beginning of the academic year 2023-24 to define specific transitional provisions. The students concerned will be contacted individually.

### Transitional provisions for Biodiversity conservation: an interdisciplinary perspective specialisation module

Students who followed all courses of this specialization before 2023-24 must be examined on the earlier content as mentioned by the previous program (2022-23).

For students who have started this specialization and have not followed its full content in 2022-23 (or before), an analysis will be carried out by the Dean's Office at the beginning of the academic year 2023-24 to define specific transitional provisions. The students concerned will be contacted individually.

### Examination modalities in the case of online exam sessions

If an exam session has to be held online, the examination modalities mentioned in this study plan are maintained and will be following.

- For a written exam to be held during the exam session (1h, 2h or 3h), the online exam will be of the duration mentioned by the study plan. An exception is made when the same exam evaluates two or more different courses simultaneously (indicated as a common or grouped exam in the study plan). In this case, the courses will be examined separately when the exam takes place online. The duration of each part of the on-line exam will be defined by the number of ECTS each examined course. A single mark will be notified for any such split up exam, as specified by the study plan.
- For oral exams to be held during the exam session, the online duration of the exam is maintained as specified in the study plan.
- Continuous assessments (graded or ungraded) remain unchanged even if the exam session is taking place online. If required, the evaluation modality will be adapted to the situation. The course description will be updated accordingly by the teacher in charge.
- All exams and assessments that take place in other Faculties or Universities remain under their responsibility and the FS cannot be held liable for specific rules and regulations regarding those evaluations.