

The Master program has a normal duration of 3 semesters and comprises 90 ECTS :

- 15 ECTS : Compulsory courses (Module 1)
- 15 ECTS : First step project (Module 2)
- 15 ECTS : Optional courses (Module 3)
- 45 ECTS : Personal research project (Master thesis) (Module 4)

Modules 2 and 4 have to be in computational ecology or evolution field, validated by head of CEE specialisation

**Training objectives** are available in its programme regulations.

**Specific training objectives:** At the end of the course the students will be able to:

- Model population processes.
- Make advanced use of computer and statistical methods in ecology and population biology.
- Use computer programming techniques.

### Autumn Semester (semester 1)

	Courses / Enseignement	Hours per semester			Teaching Staff	ECTS Credits	Limited nb of students
		C	E/S	PW			
MODULE 1	<b>Compulsory / Obligatoires</b>						
	Advanced Data Analysis in Biology I-II <i>Analyse de données en biologie I-II : niveau avancé</i>	12	-	12	Schütz F.	4.5	
	Introduction into Scientific Writing <i>Introduction à la rédaction scientifique</i>	7	9	-	Waterhouse R.	2	
	Molecular Genetics <i>Génétique moléculaire</i>	18	-	21	Sanders I., Fumagalli L. Salamin N.	3.5	
	Populations Genetic and Dynamic <i>Génétique et dynamique des populations</i>	7	10	-	Goudet J.	1.5	
	Programming for Bioinformatics <i>Programmation pour bioinformatique</i>	7	14	-	Salamin N.	2	
	Seminars of the Dept. of Ecology and Evolution <i>Séminaires du Dept Ecologie et Evolution</i>	-	14	-	Goudet J.	-	
	Spatial Analysis and GIS in Ecology <i>Analyses spatiales et SIG en écologie</i>	7	10	-	Guisan A.	1.5	
	Subtotal	58	57	33			
<b>Total</b>						<b>15</b>	

MODULE 2	<b>Practical Project / Travail pratique</b>						
	First Step Project <i>Travail d'initiation à la recherche</i>	-	-	224	Goudet J., Robinson-Rechavi M.	15	

Computational oriented courses are highlighted in blue

#### Abbreviations

C = Course  
 E/S = Exercise/Seminar  
 PW = Practical Work

### Spring Semester (semester 2)

	Courses / Enseignement	Hours per semester			Teaching Staff	ECTS Credits	Limited nb of students
		C	E/S	PW			
<b>Computational optional courses *</b>							
<i>Enseignements computationnels optionnels</i>							
	Advanced Quantitative Genetics <i>Génétique quantitative avancée</i>	10	7	-	Robinson M.	1.5	
	A Genomic Perspective on Early Human Migrations; an Introduction to Coalescent Theory and its Applications (MSc MLS) <i>Caractériser les premières migrations humaines à l'ère génomique: une introduction à la théorie de la coalescence et à ses applications (MSc MLS)</i>	11	3	-	Malaspinas A.-S.	1.5	
	Bioinformatic Algorithms (MSc MLS) <i>Algorithmes de bioinformatique (MSc MLS)</i>	15	15	-	Dessimoz C., Gfeller D.	3	
	Phylogeny and Comparative Methods <i>Phylogénie et méthodes comparatives</i>	7	14	-	Salamin N.	1.5	
	Predictive Models of Species' Distribution <i>Modèles de distribution d'espèces et de la biodiversité</i>	14	14	-	Guisan A.	3	
	Social Evolution : from Genes to Culture <i>Evolution sociale : des gènes à la culture</i>	28	-	-	Lehmann L.	3	
<b>Optional courses *</b>							
<i>Enseignements optionnels</i>							
	Applied Ecology <i>Ecologie appliquée</i>	14	-	28	Pellet J.	3	
	Biological Invasions <i>Invasions biologiques</i>	14	-	-	Alexander J., Guisan A.	1.5	
	Co-evolution, Mutualism, Parasitism <i>Co-évolution, mutualisme, parasitisme</i>	14	-	-	Sanders I.	1.5	
	Current Problems in Conservation Biology <i>Problèmes actuels en biologie de la conservation</i>	14	14	-	Wedekind C.	3	
	Ecology of the Fishes of Switzerland <i>Ecologie des poissons de Suisse</i>	7	-	10	Rubin J.-F.	1.5	
	Evolution of Sex Determination <i>Evolution du déterminisme du sexe</i>	14	-	-	Perrin N.	1.5	8
	Evolutionary Consequences of Hybridization and whole Genome Duplication <i>Conséquences évolutives de l'hybridation et de la duplication de génome</i>	14	-	-	Arrigo N.	1.5	
	Honeybee Ecology, Evolution and Conservation <i>Ecologie des abeilles, évolution et conservation</i>	14	-	-	Dietemann V.	1.5	
	Plant Population Genetics and Conservation <i>Génétique des populations végétales et biologie de la conservation</i>	7	-	10	Felber F.	1.5	
	Plant Range Dynamics and Global Change <i>Dynamique des distributions géographiques de plantes et changements globaux</i>	7	-	10	Randin C.	1.5	
	Scientific Mediation and Communication - Scientific Hands-on Workshop Module (in French only) <i>Communication et médiation scientifique - module atelier scientifique</i>	8	-	20	Kaufmann A., Reymond P., Ducoulombier D., Trouilloud S.	3	6
	Scientific Mediation and Communication - Museum Module <i>Communication et médiation scientifique - module musée</i>	28	-	-	Sartori M., Glaizot O.	3	6
<b>Optional Field Courses (1)</b>							
<i>Etudes de terrain optionnel</i>							
	Biological Conservation of the Mediterranean Region <i>Biologie de la conservation dans les régions méditerranéennes</i>	-	-	40	Roulin A., Christe P., Fumagalli L.	2	
	Ecology and Faunistics of the Sea Shore, Roscoff <i>Ecologie et faunistique du bord de mer, Roscoff</i>	7	-	49	Perrin N.	3	20
	Evolution and Biogeography of Semi-arid and Island Floras <i>Evolution et biogéographie des flores insulaires en zone semi-aride</i>	-	-	40	Pannell J.	2	
	Mountain Ecosystems: Patterns and Processes <i>Ecosystèmes montagnards : patterns et processus</i>	14	-	40	Guisan A.	3	
<b>Total</b>						<b>15</b>	

\* Students can choose optional courses in the field of the Master independently from this study plan for a max. of 3 ECTS credits and at least 6 ECTS in Computational oriented optional courses (marked in blue)

(1) Financial participation by the student required

### Spring semester (semester 2) and Autumn Semester (semester 3)

	Course / Enseignement	Teaching Staff	ECTS
			Credits
	Master Thesis CEE <i>Travail de Master CEE</i>	Thesis Director	45