UNIL | Université de Lausanne
Ecole de biologie

Master of Science in Behaviour, Evolution and Conservation
Specialisation Computational Ecology and Evolution
2020-2021

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)

MODULE 1

Courses / Enseignement	Hours per semester C	E/S	PW	Teaching Staff	ECTS Credits	Limited nb of students
Compulsory / *Obligatoires*						
Data Analysis *Analyses de données*	6	-	6	**Salamin N.,** Bergmann S., Ciriello G., Trejo Banos D.	2	
Advanced Data Analysis *Analyses de données : niveau avancé*	6	-	6	**Salamin N.,** Bergmann S., Ciriello G., Trejo Banos D.	2,5	
Introduction into Scientific Writing *Introduction à la rédaction scientifique*	7	9	-	**Waterhouse R.**	2	
Molecular Methods in Ecology and Evolution *Méthodes moléculaires en écologie et évolution*	18	-	21	**Sanders I.,** Fumagalli L. Salamin N.	3,5	
Population Genetics and Dynamics *Génétique et dynamique des populations*	7	10	-	**Goudet J.**	1,5	
Programming for Bioinformatics (MSc MLS) *Programmation pour bioinformatique*	7	14	-	**Salamin N.**	2	
Spatial Analysis and GIS in Ecology *Analyses spatiales et SIG en écologie*	7	10	-	**Guisan A.**	1,5	
Master BEC Retreat *Retraite Master BEC*	-	-	-	**Kawecki T.**	-	
Seminars of the Dept. of Ecology and Evolution *Séminaires du Dept Ecologie et Evolution*	-	14	-	**Kawecki T.**	-	
Introduction to R (optional support) *Introduction à R (mise à niveau optionnelle)*				**Schütz F.**	-	
Subtotal	58	43	33			
Total					**15**	

MODULE 2

Practical Project / *Travail pratique*						
First Step Project *Travail d'initiation à la recherche*	-	-	224	**Kawecki T., Robinson-Rechavi M.**	**15**	

Computational oriented courses are highlighted in blue

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

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Spring Semester (semester 2)

MODULE 3

Courses / Enseignement	Hours per semester C	E/S	PW	Teaching Staff	ECTS Credits	Limited nb of students
Computational optional courses * *Enseignements computationnels optionnels*						
Advanced Population Genetics (MSc MLS) *Génétique des populations avancée (MSc MLS)*	14	6	-	**Malaspinas A.-S.**	3	20
Bioinformatic Algorithms (MSc MLS) *Algorithmes de bioinformatique (MSc MLS)*	15	15	-	**Dessimoz C.**, Gfeller D.	3	
Comparative Genomics : from Thousands of Genomes to Single Cells *Génomique comparative : des milliers de génomes aux cellules individuelles*	7	7	-	**Arguello R.**	1,5	
Phylogeny and Comparative Methods *Phylogénie et méthodes comparatives*	7	14	-	**Salamin N.**	1,5	
Spatial Modelling of Species and Biodiversity *Modélisation spatiale des espèces et de la biodiversité*	14	14	-	**Guisan A.**	3	
The Evolution of Cooperation : from Genes to Learning and Culture *L'évolution de la coopération : des gènes à l'apprentissage et la culture*	28	-	-	**Lehmann L.**	3	
Optional courses * ***Enseignements optionnels***						
Applied Ecology *Ecologie appliquée*	14	-	28	**Pellet J.**	3	
Biological Invasions *Invasions biologiques*	14	-	-	**Bertelsmeier C.**	1,5	
Co-evolution, Mutualism, Parasitism *Co-évolution, mutualisme, parasitisme*	14	-	-	**Sanders I.**	1,5	
Current Problems in Conservation Biology *Problèmes actuels en biologie de la conservation*	14	14	-	**Wedekind C.**	3	10
Ecology of the Fishes of Switzerland *Ecologie des poissons de Suisse*	7	-	10	**Rubin J.-F.**	1,5	
Evolutionary Consequences of Hybridization and whole Genome Duplication *Conséquences évolutives de l'hybridation et de la duplication de génome*	14	-	-	**Arrigo N.**	1,5	
Honeybee Ecology, Evolution and Conservation *Ecologie des abeilles, évolution et conservation*	14	-	-	**Dietemann V.**	1,5	
Integrated course Mountain Ecosystems - Ecology & Evolution *Cours intégré écosystèmes de montagne - écologie et évolution*	14	-	-	**Guisan A.**	1,5	
Integrated course Mountain Ecosystems - Geo-Environmental Sciences *Cours intégré écosystèmes de montagne - sciences géo-environnementales*	14	-	-	**Guisan A.**	1,5	
Introduction to Primate Behaviour, Cognition and Culture *Introduction au comportement, à la cognition et à la culture des primates*	10	8	-	**Van de Waal E.**	1,5	
Plant Population Genetics and Conservation *Génétique des populations végétales et biologie de la conservation*	7	-	10	**Felber F.**	1,5	
Scientific Communication - Scientific Hands-on Workshop Module (in French only) *Médiation scientifique - module atelier scientifique*	14	14	-	**Kaufmann A., Reymond P.,** Ducoulombier D., Trouilloud S.	3	8
Scientific Mediation and Communication - Museum Module *Communication et médiation scientifique - module musée*	6	-	22	**Sartori M.,** Glaizot O.	3	6
Social Genetics *Génétique sociale*	2	12	-	**Keller L.**, Kay T.	1,5	
Optional Field Courses (Financial participation by the student required) ***Etudes de terrain optionnelles***						
Ecology and Faunistics of the Sea Shore, Roscoff *Ecologie et faunistique du bord de mer, Roscoff*	7	-	49	**Schwander T.**	3	20
Evolution and Biogeography of Semi-arid and Island Floras *Evolution et biogéographie des flores insulaires en zone semi-aride*	-	-	40	**Pannell J.**	2	14
Integrated Practical Work Mountain Ecosystems in the Alps ** *Travaux pratiques intégrés écosystèmes de montagne dans les Alpes*	-	-	44	**Guisan A.**	2	
Total					**15**	

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

** To follow Integrated Practical Work Mountain Ecosystems in the Alps : do the two courses Integrated course Mountain Ecosystems

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

MODULE 4

Course / Enseignement		ECTS Credits
Master Thesis CEE *Travail de Master CEE*	Thesis Director	**45**

Due to the sanitary evolution related to COVID-19, the study plans may be adapted during the semester as follows:

- possibility to switch from one mode of teaching to another (face-to-face <-> distance, synchronous <-> asynchronous, switch to co-modal teaching where it was not initially planned).
- adaptation of evaluation modalities, without inducing derogations from the Study Regulations (oral <-> written, exam <-> validation, individual work <-> group work, practical work <-> theoretical work, face-to-face evaluation <-> online evaluation, etc.).
- alternative or time-shifted modalities for teachings, internships, practical work, fieldworks and camps that could not take place or teachings that could no longer take place in the form initially planned.

Students are invited to consult this document regularly (Study Plan & Evaluation Procedure)