Course directory 2020.2021

school of Biology (FBM-BIO) Master

* your selection

> Biology > Master of Science (MSc) in Behaviour, Evolution and Conservation, Specialisation Behaviour, Economics and Evolution

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SUMMARY

NOTICE

This course catalogue was produced using data from the *SylviaAcad* information system of the University of Lausanne. Its database contains all information about courses proposed by the different faculties and their times. This data can also be consulted online at the address :
https://applicationspub.unil.ch/interpub/noauth/php/Ud/index.php.

Web site of the faculty : **http://www.unil.ch/ecoledebiologie/**

Generated on : 09.11.2021

LEGEND

NAME OF THE COURSE

Teacher

Type of course	Status	Hours per week	Teaching language	Hours per year
Semester	Credits			

N: Levels

P: Programme requirements

O: Objective

C: Content

B: Bibliography

I: Additional information

ABBREVIATIONS

TYPE OF COURSE

Attest.	Attestation
C	Course
C/S	Course - seminar
Cp	Camp
E	Exercises
Exc	Excursion
Lg	Guided lecture
S	Seminar
T	Fieldwork
TP	Practical work

STATUS

Fac	Facultative
Obl	Compulsory
Opt	Optional
Fac/Comp/Opt	Facultative, compulsory or optional (according to the study programme)

SEMESTER

Sp	Spring
A	Autumn

UNIL | Université de Lausanne
Ecole de biologie

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

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

- 15 ECTS : Compulsory (10 ECTS) and Optional Courses (5 ECTS) (Module 1)
- 15 ECTS : First Step Project (Module 2)
- 30 ECTS : Compulsory (12 ECTS) and Optional Courses (18 ECTS) (Module 3)
- 30 ECTS : Personal Research Project (Master Thesis) (Module 4)

For specialisation Behaviour, Economics and Evolution (BEE) (30 ECTS), the student must obtain :
- 6 ECTS with Compulsory courses (marked in blue) in the Module 1
- 12 ECTS with Compulsory interdisciplinary subjects (marked in blue) in the Module 3
- 12 ECTS with at least 3 ECTS with Optional disciplinary subjects (marked in green) and at least 6 ECTS with Optional Interdisciplinary subjects (marked in blue) in the Module 3
- Modules 2 and 4 have to be in behaviour, economics and evolution fields, validated by the head of BEE specialisation

Training objectives are available in its programme regulations.

Specific training objectives: At the end of the course the students will be able to:
• Interact with biologists and economists alike and thus foster and stimulate interactions between these two fields of study.
• Respond to a biological question of behaviour and / or conservation and resource management by mobilising relevant economic science concepts.

Autumn Semester (semester 1)

	Courses / Enseignement	Hours per semester C	E/S	PW	Teaching Staff	ECTS Credits	Limited nb of students
MODULE 1	**Compulsory / *Obligatoires***						
	Data Analysis *Analyses de données*	6	-	6	**Salamin N.,** Bergmann S., Ciriello G., Trejo Banos D.	2	
	Introduction into Scientific Writing *Introduction à la rédaction scientifique*	7	9	-	**Waterhouse R.**	2	
	Master BEC Retreat *Retraite Master BEC*	-	-	-	**Kawecki T.**	-	
	Microeconomics and Game Theory (HEC) *Microéconomie et jeux théoriques*	56	-	-	**Thöni C.**, A. Gizatulina	6	
	Subtotal	69	9	6		**10**	
	Optional / Optionnel *						
	Advanced Data Analysis *Analyses de données : niveau avancé*	6	-	6	**Salamin N.,** Bergmann S., Ciriello G., Trejo Banos D.	2,5	
	Molecular Methods in Ecology and Evolution *Méthodes moléculaires en écologie et évolution*	18	-	42	**Sanders I.,** Fumagalli L. Salamin N.	5	
	Spatial Analysis and GIS in Ecology *Analyses spatiales et SIG en écologie*	7	10	-	**Guisan A.**	1,5	
	Animal Experimentation and Wild Animals ** *Expérimentation animale et animaux sauvages*	20	-	20	**Rubin J.-F.**	-	
	Introduction to R (optional support) *Introduction à R (mise à niveau optionnelle)*				**Schütz F.**	-	
	Animal Communication and Parasitism *Communication animale et parasitisme*	14	-	-	**Christe P.,** Roulin A.	1,5	
	Major Transitions in Evolution *Les grandes étapes de l'évolution*	14	-	-	**Keller L.**	1,5	12
	Phylogeography *Phylogéographie*	7	10	-	**Fumagalli L.**	1,5	
	Population Genetics and Dynamics *Génétique et dynamique des populations*	7	10	-	**Goudet J.**	1,5	
	Total					**15**	
MODULE 2	**Practical Project / *Travail pratique***						
	First Step Project *Travail d'initiation à la recherche*	-	-	224	**Kawecki T., Lehmann L.**	**15**	

*	Obtain at least 3 ECTS from disciplinary courses (marked in green)
**	Only students who choose a master project with animal experimentation are allowed to select this course

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

BIOLOGICAL SECURITY

Patrick Michaux

C	Obl	English	2
A			

N: Master

P: A basic knowledge of microbiology and vegetal science

O: To familiarise future researchers with legislation concerning genetic engineering. In addition, possible biological risks associated to different applications of this technology will be discussed with the help of examples.
This teaching is a mandatory prerequisite for First-Step.

C: * Legislation: article 24 of the Federal Constitution; law concerning environmental protection; law concerning epidemics; ordnance on protection against major accidents; Swiss commissions on biological security: notification and registration of projects.
* Biological security in the laboratory: containment; security equipment; technical measures: laboratory construction; standard laboratory (microbiological) practice; classification of biological material: plasmids, microorganisms, cell lines, primary cells; security levels 1-4.
* Release of genetically modified bacteria in the environment: monitoring, survival and dissemination, ecological impact, transfer of genes, containment systems.
* Potential biological risks associated with the use of transgenic plants: dissemination, cross-pollination, gene transfer.
* The problem of recombinant vaccines: vectors, DNA vaccines.
* Somatic genetic therapy I: Illnesses accessible to treatment by somatic genetic therapy, gene transfer methods.
* Somatic genetic therapy II: Evaluation of the biological risk for the patient and his environment.

DATA ANALYSIS

Nicolas Salamin

C	Obl/Opt	English	6
A	2.00		

TP	Obl/Opt	English	6
A			

N: Master

P: We assume nothing more than the mathematics you would have obtained in your studies when you were 18.

O: In this course the goal is to be able to formulate hypotheses properly, design experiments, whether in the laboratory, in a clinic, or in the filed, that have sufficient power to test these hypotheses, conduct appropriate statistical tests of the data generated, generate clear figures, and interpret the results obtained.

C: We will cover:
1. Distributions and random variables
2. Variance, covariance and measures of association
3. Constructing statistical tests using distributions
4. Regression
5. Non-linear regression

INTRODUCTION INTO SCIENTIFIC WRITING

Robert Waterhouse

C	Obl	English	7
A	2.00		

E	Obl	English	9
A			

N: Master

P: Lecturing and paper writing are in English.

O: This short but intensive block course introduces students to the practice of scientific writing (and aspects related to publishing in peer-reviewed scientific journals).
We will discuss questions/topics such as:
- Why is it important to publish?
- What is good/clear versus bad/unclear (scientific) writing?
- How to learn how to write well?
- How to structure and write a good scientific manuscript?
- The submission, editorial and reviewing process.
- How to review someone else's paper?
- Plagiarism and publication ethics

Publishing is of key importance in scientific research: your job as a scientist is not finished until you have published your results - science is to a very large extent about effectively communicating your results and insights, i.e. what you have learned about how nature works.
The ultimate aim of this intensive course is thus to equip students with a solid understanding of how to effectively communicate their research in writing.

C: Course Content

The course includes both lectures and practical exercises in class, distributed over four half-days. The lectures will give a broad and brief overview of different aspects of scientific writing and publishing as well as on plagiarism and publication ethics; however, the major emphasis of the course is on practical work on the part of the students. During the practical parts the students will learn, from scratch, the fundamental structure and essential components of scientific writing, how to write effective outlines/drafts and - most importantly - how to write complete, clear, well-structured papers. These practical exercises will thus require students to do reading and writing assignments, often under a bit of time pressure.

At the beginning the exercises will be worked on by teams of 2-4; towards the end, each student will work individually. Finally, to get a grade for this class, students will have to complete a written report (homework assignment). For each exercise as well as for the written report we will give detailed and individualized feedback. Note that all lecturing and assignment writing are in English.

Detailed Programme

Module 1: Lecture 1: Writing papers: overview of why and how.

We will discuss the following: Overview of class and organizational things (incl. homework assignments). Why is it important to publish? What is good/clear versus bad/unclear (scientific) writing? How to learn how to write well? [We will also briefly touch upon issues of good scientific practice and conduct, and various ethical issues connected to publishing.] Approx. 2 hours.

Module 1: Practical 1. Summarise a paper: title, keywords, abstract.

In groups of 2-3. Read the assigned (stripped down and short) manuscript and come up with a title and with keywords. Then write a short abstract (< 200 words). Approx. 1.5 hours. We will then discuss the solutions you have come up with, and their potential pros and cons, together in class. Approx. 30 mins.

Module 2: Lecture 2: Writing papers: details on structure, drafting, revising.

We will discuss the basics and essentials of writing a scientific paper (and also what not to do!). Specifically, I will explain how a paper should be structured and sub-structured, how to draft a paper (i.e., how to get started), how to build and complete a full manuscript, and then how to improve it by continuous and aggressive revising and re-revising. I will also give you hints and tips for effective writing. Approx. 1.5 hours.

Module 2: Practical 2. Write a paper: your own nano-paper from results.

I will give you some data/results (e.g., data figures/tables/legends/statistical outcomes) to choose from. Form teams of 3-4 people. Ask yourself: What do the results/tables/figures/analyses show and mean? Then prepare a very short nano-paper (2 pages max), including: Title, Abstract, Introduction, Materials and Methods, Results, Discussion and Conclusion (there are some other components in a paper that we will skip for the sake of this exercise). Each component should be between 1 and 3-4 sentences maximum. Approx. 2 hours. We will then discuss your solutions and their potential pros and cons together in class; Approx. 30 mins. We will then give you detailed feedback on your papers by e-mail after the course.

Module 3: Lecture 3: Publishing papers: understanding the whole process.

We will briefly recapitulate what we have discussed and learned so far, and then focus on the 'final' stages of writing a paper and submitting it to a journal. Approx. 1 hour

Module 3: Practical 3: Review a paper: critically assess a manuscript.

What distinguishes a good from a bad manuscript? Now you are the reviewer! Being a critical reviewer will help you to learn to distinguish between good and bad writing and thus help you to improve your own scientific writing. You will be given a short, stripped-down manuscript. Team up in groups of 2-3. Read both manuscripts critically, then make pro and contra lists for both manuscripts. Briefly explain why you would accept/reject (or reach some other decision) the manuscript for publication (

MICROECONOMICS & GAME THEORY

Christian Thoeni

C	Obl	4	English
A	6.00		

N: Master

B:

- Lecture notes , slides, and problem sets
- Frank, R. H. (2009). Microeconomics and behavior (8th ed.). McGraw-Hill.

I: http://moodle.unil.ch/course/view.php?id=21953

ADVANCED DATA ANALYSIS

Nicolas Salamin

C	Obl/Opt	English	6
A	2.50		

TP	Obl/Opt	English	6
A			

N: Master

P: You must have attended the first data analysis course, or convince me that you are competent at basic statistical analyses.

O: The aim of this course is to build upon the data analysis course, to prepare you to handle a range of different data and more complex analysis problems.

C: In this course we will cover:
1. Repeated measures models and mixed effects models.
2. Survival analyses
3. Bayesian statistical inference

MOLECULAR METHODS IN ECOLOGY AND EVOLUTION

Luca Fumagalli, Ian Sanders

C	Obl/Opt	English	18
A	3.50/5.00		

TP	Obl/Opt	English	42
A			

N: Master

O: The objective of this course is to learn the relevant molecular tools that are currently used in ecology, evolutionary and conservation biology research and understand why and when to apply them.

C: This course covers the reasons why molecular genetics is a necessary tool in many ecology, evolution and conservation biology projects. We study its uses and then look at at selection of techniques, particularly for looking at polymorphism, that are not traditionally taught in molecular cell biology courses. Man of the techniques can only be learnt in the classroom as there is not enough time in a week to practically learn all useful techniques. Therefore, the associated laboratory class cover some of the fast techniques that are useful for studying polymorphisms in populations.

B: The course is mostly based on publications in international journals rather than one specific book. The publications are made available in pdf format at the beginning of the course.

SPATIAL ANALYSIS AND GIS IN ECOLOGY

Antoine Guisan

E	Obl/Opt	English	10
A			

C	Obl/Opt	English	7
A	1.50		

N: Master

P: Basics in statistics and ecology

O: Teaching students the basics of GIS and remote sensing, as well as the main spatial methods available in spatial ecology.

C: 1. Introduction to GIS
2. Introduction to remote sensing
3. Raster analyses
4. Neighbourhood analyses
5. Spatial interpolation
6. Detection of spatial structures and patterns

B: Wadsworth, R. & Treweek, J. 1999. Geographical Information Systems for Ecology
Caloz, R. & Collet, C. 2002. Précis de télédetection, vol. 3. Presses Univ. du Québec
Turner, Gardner, O'Neill 2001. Landscape Ecology in Theory and Practice: Patterns and Process. Springer
Dale, Birks, Wiens 2000. Spatial Pattern Analysis in Plant Ecology. Cambridge University Press.
Klopatek, J.M. & Gardner, R.H. 1999. Landscape Ecological Analysis: isuues and applications. Springer.
Hunsaker, C.T., Goodchild, M.F., Friedl, M.A. and Case, T.J. (Eds). 2001. Spatial uncertainty in ecology. Springer.
Hansson, L., Fahrig, L. and Merriam, G. 1995. Mosaic Landscapes and Ecological Processes. Chapman & Hall.

I: http://www.unil.ch/ecospat

ANIMAL EXPERIMENTATION AND WILD ANIMALS

Jean-François Rubin

C	Opt	English	20
A			

TP	Opt	English	20
A			

N: Master

ANIMAL COMMUNICATION AND PARASITISM

Philippe Christe

C	Opt	English	14
A	1.50		

N: Master

P: None

O: Across the animal kingdom, individuals of the same species differ in their propensity to take risks, and explore new environments, and to be active, aggressive or sociable. Individual differences in behaviour that are consistent through time and across contexts are coined 'personalities', 'behavioural syndromes' or 'temperaments'. The terminology of personality is not a mere fashionable label of something usually studied by behavioural ecologists, but useful to conceptualize the common phenomenon that individuals differ markedly and consistently in their behavioural phenotypes across ecological and social contexts. The notion of personality implies that suites of behaviours are correlated within individuals and hence individuals are less flexible than would be expected under optimality models. In this course, I propose to study personality from an evolutionary point of view and also the evolution of language.

C: This lecture is interactive and illustrated by recent research articles.
7h will be given by A. Roulin and 7h by P. Christe

B: Réale, D., Reader, S.M., Sol, D., McDougall, P.T. & Dingemanse, N.J. (2007). Integrating animal temperament within ecology and evolution. Biol. Rev., 82, 291-318.
Sih, A., Bell, A.M., Johnson, J.C. & Ziemba, R.E. (2004). Behavioral syndromes: an integrative overview. Q. Rev. Biol., 79, 241-277.
Journaux scientifiques figurant à la bibliothèque du Biophore ou sur internet (http://perunil.unil.ch/perunil/periodiques/).

I: Aucune

MAJOR TRANSITIONS IN EVOLUTION

Laurent Keller

C	Opt	English	14
A	1.50		

N: Master

P: none

O: The aim of this course is to discuss some of the major transitions that occurred over the course of evolution. The general idea is that students will be able to work on a topic they selected themselves

C: Students (in groups of 2 or 3) will have to identify a specific topic of interest and make a short presentation. There will then be a discussion between all participants of the course. The discussion will be lead by the students presenting and myself. Examples of topics that have previously been chosen by students include: Evolutionary explanation to the evolution of cooperation, speciation, the resolution of genomic conflict, evolution of sex chromosomes, the moulding of senescence, and the evolution of sexes.

B: La bibliographie sera déterminée lors du cours

PHYLOGEOGRAPHY

Luca Fumagalli

C	Opt	English	7
A	1.50		

E	Opt	English	10
A			

N: Master

O: 1) Course
Study of the historical processes (population expansions, bottlenecks, vicariance and migration) responsible for the current geographic distribution of genealogical lineages.
2) TPs
Analysis and interpretation of phylogeographic data with the help of several softwares.

C: 1) Phylogeography: definition and historical backgrounds
2) Animal and plant molecular markers
3) Distribution area
4) Gene tree/species tree
5) Molecular clocks
6) Coalescence
7) Mismatch distribution
8) Phylogenetic trees and networks
9) Phylogeographic patterns
10) Comparative phylogeography
11) Phylogeography and conservation
12) Phylogeography and genomics.

B: Avise JC. 2000. Phylogeography. Harvard University Press.

POPULATION GENETICS AND DYNAMICS

Jérôme Goudet

C	Obl/Opt	English	7
A	1.50		

E	Obl/Opt	English	10
A			

N: Master

P: A good grasp of the principles of population genetics and population dynamics (i.e. at least an introductory course in both)

O: Gain an understanding of how genetics and genomics interact with demographic and selective processes.
website:
http://www2.unil.ch/popgen/teaching/PGD20

C: In the first part of the course, selected papers from the recent literature are presented by students and discussed in a journal club format.
In the second part, in groups of 2-3 students you will use computer simulations and the quantiNemo program to investigate questions such as:
-efficacy of selection in the face of gene flow?
-effect of the number of loci encoding a trait on the speed of adaptation
-is neutral diversity a good proxy for adaptive diversity?

I: http://www2.unil.ch/popgen/teaching/PGD20/

FIRST STEP PROJECT

Richard Benton, Marie-Christine Broillet, Antoine Guisan, Tadeusz Kawecki, Laurent Lehmann, Marc Robinson-Rechavi

TP	Obl	English	224
A	15.00		

TP	Obl	English	282
A	15.00		

TP	Obl	English	250
A	14.00		

TP	Obl	English	224
A	15.00		

TP	Obl	English	224
A	15.00		

TP	Obl	English	224
A	15.00		

N: Master

P: Practicals performed during the bachelor (molecular biology, genetics, biochemistry, bioinformatics)

O: - An initiation to the work of a scientist
- Conduct experimental work in research lab (wet bench or in silico)
- Interpretation of research results
- Implement basic principles in experimental design (e.g. include the appropriate controls, statistical significance of the results etc...)
- Present your experimental work in a written report which will be organized like a typical research article (intruduction, results, discussion, materials and methods)
- present your work orally (seminar style)

C: Perform laboratory work for about 12 weeks during the time when the student does not follow theoretical classes. This research project will typically be performed under the guidance of a PhD student or a post-doc from the host laboratory.

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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
Compulsory interdisciplinary subjects ***Sujets interdisciplinaires obligatoires***						
Behaviour, Economics and Evolution Lecture Series *Séminaires BEE*	10	10	50	**Lehmann L.**, Santos-Pinto L.	6	
Environmental Economics *Economie environnementale*	28	-	-	**Di Falco S.**	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	
Subtotal	56	10	50		**12**	
Optional disciplinary subjects * ***Sujets disciplinaires 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	
Comparative Genomics : from Thousands of Genomes to Single Cells *Génomique comparative : des milliers de génomes aux cellules individuelles*	7	7	-	**Arguello R.**	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	
Phylogeny and Comparative Methods *Phylogénie et méthodes comparatives*	7	14	-	**Salamin N.**	1,5	
Plant Population Genetics and Conservation *Génétique des populations végétales et biologie de la conservation*	7	-	10	**Felber F.**	1,5	
Spatial Modelling of Species and Biodiversity *Modélisation spatiale des espèces et de la biodiversité*	14	14	-	**Guisan A.**	3	
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***						
Drivers of Invertebrate Biodiversity along Ecological Gradients *Facteurs déterminant la biodiversité des invertébrés le long de gradients écologiques*	7	-	49	**Schwander T.**	3	20
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	

* Possibility of taking Optional interdisciplinary courses from the module 1 during semester 3 according to their availability

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

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MODULE 3	**Optional Interdisciplinary subjects * *Sujets interdisciplinaires optionnels **						
	Neuro Economie (in french) *Neuro économie*	56	-	-	**Villa A.**	6	
	Organizational Behavior (in french) *Comportement organisationnel*	28	-	-	**Antonakis J., Dietz J.**	3	
	Political and Institutional Economics *Economie politique et institutionnelle*	56	-	-	**Saia A., Rohner D.**	6	
	Behavioral Economics (autumn) *Comportement économique*	56	-	-	**Santos-Pinto L.-P.**	6	
	Development Economics (autumn) *Economie de développement*	56	-	-	**Esposito E.**	6	
	General Approach to Management (in french - autumn) *Approche générale du management*	28	-	-	**Palazzo G., Castaner X., Conti A.**	3	
	Heuristic Decision Making Strategies (autumn) *Stratégie heuristique de prise de décision*	56	-	-	**Marewski J.**	6	
	Human Behavior and Evolutionary Inference (autumn) *Comportements humains et évolution*	56	-	-	**Efferson C.**	6	
	Leadership Development (autumn) *Le développement du leadership*	28	-	-	**Bendahan S.**	3	
	Managerial Decision Making (autumn) *Prise de décision managériale*	56	-	-	**Hoffrage U.**	6	
	Organizational Theory and Decision Making (autumn) *Théorie et prise de décision organisationnelle*	56	-	-	**Zehnder C.**	6	
	Total					30	

* Students can choose other HEC optional courses independently from this study plan in agreement with the head of BEE specialisation

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

	Course / Enseignement		ECTS Credits
MODULE 4	Master Thesis BEE *Travail de Master BEE*	Thesis Director *Directeur du travail de Master*	30

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)

BEHAVIOUR, ECONOMICS AND EVOLUTION LECTURE SERIES

Laurent Lehmann

C	Obl	English	10
S	6.00		
S	Obl	English	10
S			
TP	Obl	English	50
S			

N: Master

ENVIRONMENTAL ECONOMICS

C	Obl	2	English
S	3.00		

N: Master

B: Course material is based on the combination of book material and academic journals. These are summarized in the class hand out. They will be uploaded every week. I will follow mostly the following book: Perman, R., Y. Ma, M. Common, D. Maddison and J. McGilvray (2011) Natural Resource and Environmental Economics, 4th Edition, Pearson, Harlow. In alternative consider Kolstad, C., Environmental Economics, New York: Oxford University Press, 2000. Students that prefer a less mathematical treatment may consult Tietenberg and Lewis Environmental & Natural Resources Economics (9th Edition), Pearson.

I: http://moodle.unil.ch/course/view.php?id=19745

THE EVOLUTION OF COOPERATION : FROM GENES TO LEARNING AND CULTURE

Laurent Lehmann

C	Obl/Opt	English	28
S	3.00		

N: Master

O: What makes us such a unique species, able to cooperate in large-scale societies, organize social interactions, and dominate ecologically the Earth? The main goal of this course is to provide the foundations of social evolution, which consists of two main ingredients in humans: cooperation and cumulative cultural evolution. On one side, the course will thus focus on studying the main forces favoring and maintaining cooperation (mutually beneficial interactions, altruism) and conflict (cheating, malevolence, warfare) in group-structured populations. On the other side, we will study the forces behind cultural evolution, where behavior in interactions depends on genetic determinants, social learning, and individual learning ("gene-culture coevolution"). This will allow discussing the major steps in human social organization evolution, from primate autarky to division of labor in large-scale societies.

C: The course will be composed of five main parts and more focused on human behavior than the "Ecology and Evolution" class on which it builds:
(1) Cooperation and conflict in well-mixed populations. Here, we will study the evolution of cooperation (and cheating) in well-mixed population (no division into groups). We will study the standard one-shot social dilemmas illustrating the tension between self-interest and group-interest, like the prisoner's dilemma and the stag-hunt game. We will then investigate various settings of repeated interactions, where reputation dynamics between individuals are crucial to sustain long-term relationships.
(2) Cooperation and conflict in group-structured population. Here, we will study the forces shaping cooperation when interactions occur in group-structured populations (the rule in humans), and where the localization of the social interactions generates in the same time novel incentives to cooperate and novel incentives for spiteful behavior. We will also consider conflicts between groups and study warfare in small-scale hunter-gather societies.
(3) Social learning and gene-culture coevolutionary theory. Here, we will study the main modes of social learning ("cultural transmission"), which underlies cumulative cultural evolution that is the main determinant of the human lineage ecological success. We will also study gene-culture coevolution and how social learning impacts the dynamics of cooperation within groups.
(4) Individual learning and preferences. Here, we will discuss the main modes of individual learning that allow individuals to learn information about the relevant behavior to express on their own (e.g., trial-and error learning and related decision heuristics, maximizing behavior). We will investigate the conditions under which evolution may and may not lead individuals to become equipped with goal functions ("utility maximization behavior").
(5) Major transition from small to large-scale societies. Here, we will discuss the main evolutionary steps that took the human lineage in a 6 million year long co-evolutionary gene-culture ride from self reliant primate social organizations ("autarky") to large scale societies with extreme division of labor ("catallaxy"). This transition involved a zizag path from dominance, to egalitarianism, to inequality again.

APPLIED ECOLOGY

Jérôme Pellet

C	Opt	English	14
S	3.00		

TP	Opt	English	28
S			

N: Master

P: BSc level in biology, including ecology

O: Applied ecology is a young crisis discipline undergoing a major effectiveness revolution. In most situations, urgent action is necessary, even in the absence of reliable information. How do we gather sound ecological information? How do we use it to plan natural communities conservation? In the process of answering these questions, wildlife ecologists often realize that research and practice are just two sides of the same coin.

C: The goal of the course is to teach students some of the skills they will need as evidence-based conservationists. Practical examples will be drawn from various ecosystems, communities and species. The course will revolve around the stages of adaptive management:
monitoring ecological resources, monitoring occupancy and abundance
research syntheses (systematic reviews and meta-analyses)
ecological triage (systematic conservation planning and red lists)
natural communities conservation planning and legislative context.
Field-based case studies will provide students an opportunity to apply and discuss some of the principles illustrated in the course. Practical work will include meeting with practitioners, discussing and analyzing their approach and methods through the prism of adaptive management.
« There is no such thing as a special category of science called applied science; there is science and its applications, which are related to one another as the fruit is related to the tree that has borne it. » Louis Pasteur

BIOLOGICAL INVASIONS

Cleo Bertelsmeier

C	Opt		English	14
S	1.50			

N: Master

O:
1. Explain core theory and concepts underlying the spread and impacts of invasive species
2. Critically assess the current debate about invasive organisms (semantic, social, economic, biological..)
3. Understand how globalization leads to the accelerating dynamics of species ranging from viruses to mammals
4. Understand the characteristics of invasive species and vulnerable ecosystems
5. Discuss the interactions between biological invasions and other drivers of global change

C: Biological invasions are considered one of the most important global threats to biodiversity. Understanding the processes shaping the success of species outside of their native ranges is therefore a major goal of conservation research. In this course, we elucidate the main hypotheses explaining the success and spread of invasive species, while insisting on current controversies and future research questions. Specifically, we will address:
- The different stages of the invasion process (transport, establishment, spread, impacts)
- Impacts and case studies of some of the worst invasive species
- Mechanisms of invasions
- Socio-economic aspects
- The role of rapid adaptation in the invasion process
- Species interactions, enemy release, community structure
- Large scale patterns and dynamics
- Interactions with other drivers of global change

B: See English pages of the course

CO-EVOLUTION, MUTUALISM AND PARASITISM

Ian Sanders

C	Opt	English	14
S	1.50		

N: Master

P: Must understand english and be prepared to give presentations

O: To understand the evolutionary consequences of organisms living together in mutualism or parasitism and how to investigate it experimentally

C: The course comprises some introductory talks given by me about concepts in co-evolution and theoretical frameworks for studying co-evolution. Afterwards, students give presentations on chosen key publications in this field and the group discusses these subjects after the presentations.

B: : All bibliography is made availble in pdf format before the course begins. For an example of the publications discussed you can find last years publications in my docunil public folder.

COMPARATIVE GENOMICS: FROM THOUSANDS OF GENOMES TO SINGLE CELLS

Roman Arguello

C	Opt	English	7
S	1.50		

E	Opt	English	7
S			

N: Master

CURRENT PROBLEMS IN CONSERVATION BIOLOGY

Claus Wedekind

C	Opt	English	14
S	3.00		

E	Opt	English	14
S			

N: Master

P: Lectures, discussions, and proposal writing in English.

O: Introduction into
- some important problems of conservation biology
- funding opportunities for conservation projects
- the planning, writing, and reviewing of grant proposals in the context of the course

Own ideas shall be developed, presented and discussed in class.

C: Some current research topics within the field of conservation biology will be further introduced in lectures, potentially also guest lectures, and discussions in class. Each student then develops an own idea of a research project within these topics. After an introduction into funding agencies and the planning and writing of grant proposals, each student (or groups of two) write(s) up an own proposal and present(s) it to the class. The proposals of colleagues will then be peer-reviewed after an introduction into peer-reviewing of grant proposals.
Class size restricted to 10 students.

ECOLOGY OF THE FISHES OF SWITZERLAND

Jean-François Rubin

C	Opt	English	7
S	1.50		

TP	Opt	English	10
S			

N: Master

P: none

O: Recognize the different habitats and species
Know the biology of the principal species
Identify the problems linked to the management of these habitats and species

C: Generalities on water
Lakes
Watercourses
Plankton and plants
Systematic of fish
Anatomy of fish
The fish of Switzerland

EVOLUTIONARY CONSEQUENCES OF HYBRIDIZATION AND WHOLE GENOME DUPLICATION

Nils Arrigo

C	Opt		English	14
S	1.50			

N: Master

HONEYBEE ECOLOGY, EVOLUTION AND CONSERVATION

Vincent Dietemann

C	Opt	English	14
S	1.50		

N: Master

O: This series of lectures will show the complexity of insect societies, taking the honey bee as an example. It will give the opportunity to see how concepts learned elsewhere by the students can be placed within the context of a single species.

C: Since honeybees are economically important insects, they have been studied early in history and the knowledge we possess about them is greater than for any other social insect species. Our understanding of the honeybee reveals the complex organisation reached by insects when they form societies. This series of lectures will present some aspects of this complexity that will be replaced within its evolutionary context. Various aspects of honeybee ecology and evolution, including geophylogeny, biology, reproduction at individual and colony level, division of labour, communication, economical value, pathogens will be presented.
After a general introduction of this model species describing the diversity and biogeography of the taxon, we will dissect the communication abilities of European honeybees and compare it with related Asian species. We will see how this communication is used to organise foraging tasks sustaining colony growth. Honeybee health is a current concern and we will review the pathogens affecting them and comment the role of humans in their spread and control in an evolutionary context. Since honeybees are globally threatened, we will see what economical losses their decline could have and some conservation projects to invert the trend will be put in context.

B: Seeley T, 1985. Honeybee Ecology. Princeton University Press.
Seeley T, 1995. The wisdom of the hive. Harvard University Press.
Moritz RFA, Southwick EE, 1992. Bees are superorganisms. Spiringer Verlag
Oldroyd B, Wongsiri S, 2006. Asian Honey Bees. Harvard University Press.
Koeniger N, Koeniger G, Tingek S, 2010.Honey Bees of Borneo. Natural History Publications
Winston ML, 1987. The Biology of the honey bee. Harvard University press.

INTEGRATED COURSE MOUNTAIN ECOSYSTEMS - ECOLOGY & EVOLUTION

Antoine Guisan

C	Obl/Opt		English	14
S	1.50			

N: Master

INTEGRATED COURSE MOUNTAIN ECOSYSTEMS - GEO-ENVIRONMENTAL SCIENCES

Antoine Guisan

C	Obl/Opt	English	14
S	1.50		

N: Master

INTRODUCTION TO PRIMATE BEHAVIOUR, COGNITION AND CULTURE

Erica Van de Waal

C	Opt	English	10
S	1.50		

S	Opt	English	8
S			

N: Master

O: The first goal of this course is to give a general introduction into primate behaviour, with a special focus on primate cognition and culture. The topic will be developed in a comparative framework, with references to behaviours found in other animals as well as well highlighting behaviours shared between human and non-human primates and the ones unique to humans. This first part will give the general background to understand the articles that will be discussed in the seminar sessions. During the seminar, students will select articles to read and discuss together. This part aims at developing the critical thinking of students and the exchange between the students using concrete examples of research with conflicting findings. The course will train students to summarize, explain and discuss a paper during the final presentation in front of the class, as well as to develop ideas about potential future directions of the research on a specific topic.

C: This course will be composed of three main parts followed by seminar sessions.
1) Primate Behaviour. Here we will study briefly the bases of animal behaviour followed by a presentation of the diversity in the taxa Primates. Then we will study the specificities of Primate behaviour. We will investigates the topics of social structure, reproduction and life history. Later we will focus more on social relationships with lectures on competition and conflict management, communication and cooperation. All these topics will be discussed with a comparative approach to other animals and humans.
2) Primate Cognition. Here we will study the cognitive abilities of primates. We will investigate briefly the specificities of primate physical cognition and we will develop more on their social cognition. On this topic, we will study the abilities of primates to understand others' minds (theory of mind) and to exhibit strategic social behaviours like deception.
3) Primate Culture: Here we will study social learning mechanisms and strategies. We will investigate cases of conformity, traditions and culture in primates. This subject will highlight the specificities of human cultural behaviour as well as the shared roots with primates and other animals.
Additionally, a guest lecture will introduce students to principles of self-organised collective behaviour across taxa, from insects to fish and Humans.
During the seminar, students will choose a scientific article to read (alone or in groups depending on the number of students following the course). The papers will be discuss in the class. At the end of the seminar, all the students will present the main finding of their paper and potential future directions of research on the topic.

B: van Schaik, C. P. (2016). The primate origins of human nature (Vol. 2). John Wiley & Sons.
Clutton-Brock, T. (2016). Mammal societies. John Wiley & Sons.
Boyd, R., & Silk, J. B. (2014). How humans evolved. WW Norton & Company.

PHYLOGENY AND COMPARATIVE METHODS

Nicolas Salamin

C	Opt	English	7
S	1.50		

E	Opt	English	14
S			

N: Master

P: none

O: Phylogenetic reconstruction methods and their application in evolutionary biology. To know and understand phylogenetic reconstruction methods in order to test the processes leading to genes and organisms evolution.

C: The subjects will be presented during lectures as well as practicals.
I. Reconstruction methods
- What is a phylogenetic tree and how to interpret it?
- Tree reconstruction:
a) optimisation criteria and models of evolution
b) search for the optimum tree
c) Bayesian methods
- Can we trust the inferred tree?
II. Uses for phylogenetic trees
- Detecting positive selection in a coding gene
- Testing coevolution and cospeciation
- Macroevolution:
a) dating evolutionary events
b) tempo and mode of evolution
c) testing for key innovations
- Phylogeny and conservation

B: Felsenstein, J. 2003. Inferring phylogenies. Sinauer Associates.
Page, R. 2003. Tangled trees: Phylogeny, cospeciation, and coevolution. University of Chicago Press.
Purvis, A., Gittleman, J.L. and Brooks, T. 2005. Phylogeny and conservation. Cambridge University Press.
Swofford, D.L., Olsen, G.K., Waddell, P.J. and Hillis, D.M. 1996. Phylogeny reconstruction. Pages 407-514 In Molecular Systematics (D.M. Hillis, C. Moritz, B.K. Mable, eds.). Sinauer Associates.
Yang, Z.H. 2006. Computational Molecular Evolution. Oxford University Press.

I: http://www.unil.ch/phylo/teaching/pmc.html

PLANT POPULATION GENETICS AND CONSERVATION

François Felber

C	Opt	English	7
S	1.50		

TP	Opt	English	10
S			

N: Master

SPATIAL MODELLING OF SPECIES AND BIODIVERSITY

Antoine Guisan

C	Opt	English	14
S	3.00		

E	Opt	English	14
S			

N: Master

P: If possible, course 'Spatial Analyses & GIS' (ANSPAT) in 1st semester of the Master (not strictly required).

O: Species distribution models (SDMs) are increasingly important in ecology and conservation biology. This course proposes an introduction to these models and related concepts and methods. Overview of the main steps of model building. Advantages and limitations. Applications to various domains (climate change, invasions, rare species, ...).

C: Chap. 1. Introduction to species' niche & distributions, and related models. Theory and principles behind these models. Competition and disperal limitations. Types of response variables, main predictive modelling approaches, field sampling design, from predicting species distributions to predicting communities.
Chap. 2. Model calibration. Presence-only versus presence-absence data, statistical theory and methods for presence-only data, regressions and classifications for presence-absence, ensemble modelling and forecasting.
Chap. 3. Model evaluation. Internal versus external evaluation. Data and metrics for evaluation. Crossvalidation, jackknife, bootstrap, uncertainties.
Chap. 4. Assumptions behind these models. Pseudo-equilibrium, niche conservatism, niche completeness, realized niche, and other postulates.

B: Guisan, A. & Zimmermann, N.E. (2000). Predictive habitat distribution models in ecology. Ecological Modelling 135(2-3): 147-186.
Guisan A, Thuiller W (2005) Predicting species distribution: offering more than simple habitat models. Ecology Letters, 8, 993-1009.
Guisan et al. (2013) Predicting species distributions for conservation decisions. Ecology Letters 16: 1424-1435.

I: http://www.unil.ch/ecospat

SCIENTIFIC COMMUNICATION - SCIENTIFIC HANDS-ON WORKSHOP MODULE

Alain Kaufmann, Philippe Reymond

C	Opt	French	14
S	3.00		

E	Opt	French	14
S			

N: Master

SCIENTIFIC MEDIATION AND COMMUNICATION - MUSEUM MODULE

Michel Sartori

C	Opt	English	6
S	3.00		

TP	Opt	English	22
S			

N: Master

P: None

O: This is a theoretical and practical course which will teach you how to write a text for an exhibition (scientific popularization). From original articles and textbooks to the exhibition content, several steps are required to make the exhibition attractive and accessible to a large audience. During this course, you will learn the basics of exhibition building, from content development to the elaboration of a mediation concept and a communication strategy.

C: After a 6 period's theoretical introduction, you will develop a personal project. This year, an due to the pandemia, we will propose general subjects linked to biology. We will propose individual subjects to be developed during the first lecture hours. We are also expecting from you to create a press release on your subject, as well as a mediation project.

SOCIAL GENETICS

Laurent Keller

C	Opt	English	2
S	1.50		

E	Opt	English	12
S			

N: Master

P: none

O: This course provides the opportunity to read about, synthesise and then discuss the state-of-the-art in two social genetics topics: How did eusociality evolve? And what determines caste-fate in social insects?

C: Students will be set a question and given recent scientific papers to read and write about and they will then participate in discussions on the topic with the other students. They will additionally have the opportunity to discuss with researchers working directly on the topics.

DRIVERS OF INVERTEBRATE BIODIVERSITY ALONG ECOLOGICAL GRADIENTS

Tanja Schwander

C	Opt	English	7
S	3.00		

T	Opt	English	49
S			

N: Master

P: Program requirement: Financial participation required by the student (approximately 700.-)

O: During this field course, we study different invertebrate taxa (mainly insects and gastropods) to understand the factors driving biodiversity and community composition, as well as the evolution of different life cycles under diverse ecological conditions in the Swiss Alps/Prealps.

C: Course content:
- Introductory lectures
- Excursions and group field work: analysis of community composition and biodiversity in various habitats
- Personal experiments (experimental design, data collection & analysis, presentation of results)
- Discussion of scientific papers

ECOLOGY AND FAUNISTICS OF THE SEA SHORE, ROSCOFF

Tanja Schwander

T	Opt	English, French	49
S	3.00		

C	Opt	English, French	7
S	3.00		

N: Master

P: Financial participation required by the student.
!!! Please, contact the person in charge before your inscription !!!

O: To allow a first, integrated approach of the itertidal biotope, and to understand the role played by the tides, the substrate and other conditions on the faunistic composition of littoral communities and on the physical and behavioural adaptations of the species.

C: Lecture (6 h): Introduction to intertidal ecology.
Excursions and group field work: analysis of zonation and biodiversity in various habitats (sand beach, rock, estuaries and so on). Additionnally, each student shall be responsible for the study of one taxonomic group.
Lab experimentations: experimental design and realisation of an experiment in etho-ecology illustrating adaptative behaviour of an intertidal species.

EVOLUTION AND BIOGEOGRAPHY OF SEMI-ARID AND ISLAND FLORAS

John Pannell

T	Opt	French	40
S	2.00		

N: Master

P: Financial participation required by the student.

INTEGRATED PRACTICAL WORK MOUNTAIN ECOSYSTEMS IN THE ALPS

Antoine Guisan

T	Obl/Opt	English	44
S	2.00		

N: Master

P: Bachelor in environmental and/or biological sciences.

O: To offer an interdisciplinary vision of mountain environments and elevation gradients through the lens of different questions in ecology and evolution.

C: Two fields retreats of 2-days and 3-days, with courses and practical works and exercises, with 14C of lectures by different teachers in-between. Content of the lectures:
1. Adaptations to marginal environments
2. Reproductive systems along elevation
3. Patterns of micro-organisms along elevation
4. Biological invasions in mountains
5. Impact of climate change on mountain species and communities - field observations and experiments
6. Impact of climate change on mountain species and communities - spatial modelling
7. Human-wild fauna conflicts in mountain regions

B: See English pages of the course

I: See English pages of the course

NEURO ECONOMIE

Alessandro Villa

C	Opt	4	French
S	6.00		

N: Master

P: None

O: This course is for students who wish to acquire the principles of management of constraints and decision making from a perspective based on recent discoveries in neuroscience, cognitive science, biology and ecology.
The goal is to provide practical benchmarks to various stakeholders of the economy on resource management, information and waste in a neuroeconomics approach.

C: Contemporary society, as each individual, is set to change in a world with limited resources. The choices and decisions we are taking must necessarily consider the constraints imposed on producers and consumers through access to resources and their management. These same principles are found in brain function and behavior by one of its most characteristic behavior: decision-making with respect to whether investment, purchasing, risk taking, consumption are affordable. Where begins and ends the freedom of choice we make?
This course analyzes the information processing by the brain and especially the structures and the brain mechanisms that underlie the cognitive, motor and emotional behavior. Much of the course is devoted to the illustration of examples and experiences of neuroscience and to the methodological approach. Several chapters deal with the organization, allocation and management of resources for development and evolution of living systems in general.
Student participation will be encouraged during the development of exercises and classroom interactions. A working group will be assigned to students who must submit a written report which will be evaluated with consideration for the note.

IMPORTANT: the priority is given to those students who take this course as mandatory. In order to provide an adequate support during the course, the number of students choosing this course as optional, mainly those enrolled in the Master in Management, is limited. The group work is based on a maximum number of 12 groups, that is approximately 36-40 students maximum, including the students enrolled in the Master of Law (MLaw) in Legal Issues, Crime and Security of Information Technologies.

The reference list is indicative and goes well beyond the strict content of the course but serves to deepen the subject matter.

B: 1. Sacha Gironde - **La neuroéconomie : Comment le cerveau gère mes intérêts** – Plon Editeur, 2008.

2. Mickaël Mangot - **Psychologie de l'investisseur et des marchés financiers** – Dunod, 2008

3. Jason Zweig - **Your Money and Your Brain: Become a Smarter, More Successful Investor, the Neuroscience Way** - Souvenir Press Ltd, 2007,2008. Egalement traduit en français

4. Daniel Richard, Didier Orsal – **Neurophysiologie: Organisation et fonctionnement du système nerveux** – 3e édition, Dunod collection Science Sup., 2007.

5. Bruce Alberts, Dennis Bray, Karen Hopkin, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walter – **Essential Cell Biology** - 2nd Edition, London, GB / Garland Science, 2004.

6. D.H. Meadows, Jorgen Randers, Dennis L. Meadows - **The Limits to Growth: The 30-year Update** – White River Jct., VT / Chelsea Green Pub Co, 2004.

7. Gordon M. Shepherd - **The Synaptic Organization of the Brain** – 5th edition, Oxford University Press, USA, 2003.

8. P.W. Glimcher - **Decisions, Uncertainty, and the Brain: the Science of Neuroeconomics** – Cambridge: The MIT Press, 2003.

9. Lester, R. Brown – **Eco-économie : Une autre croissance est possible, écologique et durable** – Paris / Ed. Seuil, 2003.

10. Stan Weinstein – **Secrets pour gagner en bourse à la hausse et à la baisse** – Hendaye / Editions Valor, 1998.

11. P. Bak – **How nature works** – New York, NY. / Springer Verlag, 1996.

12. Joël de Rosnay – **L'homme symbiotique** – Collection Points (P357), Paris/Editions du Seuil, 1995.

13. Armand Petitjean, Dennis L Meadows, Club de Rome, Georg Richt – **Quelles limites?** – Paris / Ed. Seuil, 1974.

14. D.L. Meadows, W.W. Behrens, D.H. Meadows, R.F. Naill, J. Randers, E.K.O. Zahn - **Dynamics of Growth in a Finite World** – Cambridge, MA / Wright-Allen, 1974.

I: http://moodle.unil.ch/course/view.php?id=6808

COMPORTEMENT ORGANISATIONNEL

John Antonakis, Jörg Dietz

C	Opt	2	French
S	3.00		

N: Master

O: The main objective of this course is to provide an in-depth knowledge of human behavior in organizations. Variability in behaviors—which oftentimes departs from “normative” models--emanate from many factors at various levels of analysis. For example, individual differences, groups, leadership, organizational factors and national culture will be discussed using various theoretical approaches. Students will also be exposed to articles stemming from the experimental research tradition to better grasp how behavioral scientists (industrial and social psychologists, economists, etc.), solve puzzles that concern human behavior.

C:
- Culture
- Individual differences
- Perception and attribution
- Theories of motivation
- Motivation and job design
- Performance and rewards
- Decision making
- Group processes
- Leadershipand power

Refer to the course site (Moodle) for a detailed scheme of work.

B: Les slides et ressources complémentaires seront mis sur Moodle.

Lecture recommandée: Stephen Robbins & Timothy Judge (Adapté par Véronique Tran) (2014). Comportements organisationnels (16e édition). Pearson Education: France.

I: http://moodle.unil.ch/course/view.php?id=8451

POLITICAL AND INSTITUTIONAL ECONOMICS

Dominic Rohner, Philippe Tzaud

C	Opt	4	English
S	6.00		

C		2	English
A			

N: Master

B: The main handbooks that serve as references of this course are given below. The exhaustive list of references is available from the Moodle page of this course.

- Persson, Torsten, and Guido Tabellini, 2002, "Political Economics: Explaining Economic Policy," MIT Press
- Acemoglu, Daron and James A. Robinson, 2006, "Economic Origins of Dictatorship and Democracy," Cambridge University Press
- Besley, Timothy, 2006, "Principled Agents? The Political Economy of Good Government," Oxford University Press
- Besley, Timothy, and Torsten Persson, 2011, "Pillars of Prosperity," Princeton University Press
- North, Douglass, 1990, "Institutions, Institutional Change and Economics Performance," Cambridge University Press

I: http://moodle.unil.ch/course/view.php?id=15085

BEHAVIORAL ECONOMICS

Luis Pedro Santos Pinto

C	Opt	4	English
A	6.00		

N: Master

B: Most of the lectures will follow papers. However, there are three textbooks in Behavioral Economics that cover several topics of the course:

*Dhami, Sanjit, *The Foundations of Behavioral Economic Analysis*, Oxford University Press, 2016.

Wilkinson, Matthias Klaes, *An Introduction to Behavioral Economics*, Palgrave MacMillan, 2012.

Angner, Erik, *A Course in Behavioral Economics*, Palgrave MacMillan, 2012.

*Spiegler, Ran, *Bounded Rationality and Industrial Organization*, Oxford University Press, 2011.

*Wakker, Peter P., *Prospect Theory for Risk and Ambiguity*, Cambridge University Press, 2010.

Ariely, Dan, *The Upside of Irrationality: The Unexpected Benefits of Defying Logic at Work and at Home*, Harper Collins, 2010.

Ariely, Dan, *Predictably Irrational: The Hidden Forces that Shape our Decisions*, Harper Collins, 2008.

*Camerer, Colin, George Lowenstein and Mathew Rabin. *Advances in Behavioral Economics*, Russel Sage Foundation and Princeton University Press, 2004.

*Camerer, Colin, *Behavioral Game Theory: Experiments in Strategic Interaction*, Russell Sage Foundation and Princeton University Press, 2003.

*Kahneman, Daniel and Amos Tversky. *Choices, Values and Frames*, New York: Russell Sage Foundation; Cambridge, U.K.; New York: Cambridge University Press, 2000.

Thaler, Richard H. *The Winner’s Curse: Paradoxes and Anomalies of Economic Life*, Princeton University Press, 1994.

Elster, Jon and George Loewenstein. *Choice over Time*, Russell Sage Foundation, 1992.

Thaler, Richard. *Quasi Rational Economics*, New York, N.Y.: Russell Sage Foundation, 1991.

Kahneman, Daniel, Paul Slovic, and Amos Tversky, eds., *Judgment under Uncertainty: Heuristics and Biases*, Cambridge University Press, 1982.

I: http://moodle.unil.ch/course/view.php?id=22371

DEVELOPMENT ECONOMICS

Elena Esposito, Tiziano Rotesi

C	Opt	4	English
A	6.00		

N: Master

B: MAIN REFRENCE:

Banerjee, A. and E. Duflo (2011), Poor Economics; Philadephia, PA: Public Affairs.

Reading List - assigned at the start of the course.

OPTIONAL:

Ray, D. (1998), Development Economics, Princeton University Press.

I: http://moodle.unil.ch/course/view.php?id=9091

APPROCHE GÉNÉRALE DU MANAGEMENT

Pius V Bienz, Xavier Castaner, Annamaria Conti

C	Opt	2	French
A	3.00		

N: Master

O: This course introduces students to the management of different organizations (e.g.: private companies, public organizations, NGOs) and familiarizes them with different modes of management. Students shall also become aware of the broader social environment in which organizations operate. At the end of the course, students should have acquired a solid knowledge of the historical and social context in which today’s corporations are embedded, and be knowledgeable of various concepts which shall give a better understanding of management.

This year, due to the covid crisis, this cours is **taught 100% online**. Each week you will find the videos of the different sessions on moodle. In addition, each week there will be **30 minutes live sessions** for your questions. You will find the timing of those sessions for your group on moodle, as well as the link to zoom. These live sessions will start in the second week of the course.

C: The course is divided into several parts. First, we will define the notion of “management” and show that it is necessary to develop an adequate understanding of the environment (at various levels) in order to successfully manage an organization in a today’s globalized society. Then, we will turn our attention to the means by which a company can create value for its shareholders, clients, and employees, through some of its key functions: strategy, marketing, and human resource management.

Session 1, 24.09: Introduction + The organization in its environment (PB)

Session 2, 01.10: Globalization and societal transformations (PB)

Session 3, 08.10: Corporate Social Responsibility (CSR) (PB)

Session 4, 15.10: Governance of organizations (XC)

Session 5, 22.10: Strategy (I): Business policy, game theory and strategic thinking levels (XC)

Session 6, 29.10: Strategy (II): Competitive/business strategy (XC)

Session 7, 05.11: Strategy (III): Vertical integration & diversification (corporate strategy) (XC)

Session 8, 12.11: Deepening session

Session 9, 19.11: Innovation (I) (AC)

Session 10, 26.11: Innovation (II) (AC)

Session 11, 03.12: Introduction to marketing (AC)

Session 12, 10.12: Introduction to operational management (AC)

Session 13, 17.12: Management of men and women (AC)

Session 14, 24.12: Introduction to project management (PB)

I: http://moodle.unil.ch/course/view.php?id=22338

HEURISTIC DECISION MAKING STRATEGIES

Julian Marewski

C	Opt	4	English
A	6.00		

N: Master

P: Ce cours ne comporte pas d'exigences spécifiques en termes de connaissances et de compétences préalables. En fait, le cours est ouvert à la fois aux étudiants qui ne sont pas familiarisés avec les sciences cognitives et les sciences de la décision, et aux étudiants ayant déjà été immergés dans ce type de recherches.

O: Comment les humains et les autres animaux prennent-ils des décisions ? Comment devraient-ils faire pour prendre de meilleures décisions ? Qu'il s'agisse de management, de médecine ou d'autres tâches, dans le monde réel, les informations disponibles sont souvent, par nature, incertaines. En outre, les décideurs sont généralement confrontés à des contraintes de traitement de l’information, telles que la mémoire limitée, la puissance de calcul ou le temps. Les stratégies pour prendre des décisions intelligentes dans des conditions d’incertitude sont des heuristiques rapides et simples (fast and frugal heuristics). Ces règles empiriques simples ne nécessitent que des connaissances et des capacités de traitement de l’information limitées. Contre intuitivement, le recours à l'heuristique ne nécessite pas de compromis entre la précision et l'effort ou autre attribut : en exploitant la structure statistique des environnements décisionnels, l'heuristique peut être à la fois précise et simple. Ce cours offre une vue d'ensemble de la recherche interdisciplinaire sur les stratégies de prise de décision heuristiques, associant la psychologie humaine, l'intelligence artificielle, le machine learning, le business, l'économie, la biologie et d'autres domaines.

Public ciblé :

- **Les étudiants de Master** qui souhaitent découvrir le monde de la recherche, qu’elle soit menée dans le milieu universitaire lui-même ou dans le cadre d’une entreprise, ou
- qui pourraient être intéressés par des études doctorales et une carrière universitaire ultérieure, ou
- qui souhaitent se préparer à la rédaction de leur thèse de Master.

- **Les doctorants** qui souhaitent suivre ce cours dans le cadre de leurs études de doctorat.

- Enfin, le cours offre des possibilités d’apprentissage à **toute personne** souhaitant développer de manière créative ses idées de recherche, mettre en pratique des compétences telles que la présentation devant un groupe, la conduite d’une discussion, la recherche de littérature universitaire ou les compétences rédactionnelles.

C: Développées à l'origine dans les sciences cognitives et les sciences de la décision, les heuristiques rapides et frugales ont des applications dans de nombreux domaines. Ce cours permettra aux étudiants de :

- se familiariser avec les bases théoriques et méthodologiques de la recherche sur l’heuristique,
- introduire différents domaines d’application, et
- permettent aux étudiants de se concentrer librement sur un domaine d'application qui les intéresse spécifiquement - que ce soit le conseil en stratégie, la gestion, le marketing, le business intelligence, la data science, l'investissement financier, la cognition humaine (par exemple, la mémoire), la psychologie sociale (par exemple, l'obéissance à l'autorité), la recherche biologique (par exemple, la mémoire des chimpanzés), ou autre chose.

Approche :
La recherche en heuristiques se concentre sur quatre questions interconnectées. La question descriptive : Quelles heuristiques sont utilisées par les êtres humains et les animaux ? La question écologique : Dans quel environnement, une certaine heuristique mène-t-elle à une décision intelligente, et quand est-ce qu’elle échoue ? La question appliquée : Comment la prise de décision peut-elle être améliorée : en changeant les heuristiques utilisées ou en modifiant l’environnement ? La question méthodologique : Comment étudier l’usage et la performance des heuristiques, par exemple, lors d’expériences, avec des simulations sur ordinateur, ou via des analyses mathématiques ?

Après un aperçu de différentes théories sur la prise de décision, nous commencerons par chercher des réponses aux questions descriptives, écologiques et méthodologiques. Par la suite, nous couvrirons différents domaines de recherche appliquée. Enfin, les étudiants approfondiront un sujet de leur choix. Dans les domaines de spécialisation choisis, les étudiants développeront un projet de recherche. Le résultat concret de cette phase de développement de projet consiste à formuler une proposition de recherche détaillée, ou pour les étudiants avancés (par exemple doctorants), la possibilité de faire un travail empirique, d’écrire un rapport de projet (ex : une ébauche d’article).

Le cours est divisé en deux parties :

1. Séminaire de discussion académique : avant chaque session, nous lirons des articles et des chapitres de livres sélectionnés, puis nous en discuterons ensemble en classe. L'idée est que les participants acquièrent des connaissances non seulement en pensant par eux-mêmes, mais aussi en réfléchissant en groupe.

2. Développement du projet de recherche de chaque élève : les participants discuteront de leurs idées de projet et obtiendront les retours et feedbacks de la classe et de l’instructeur. Ils pourront aussi travailler sur leur projet.

Équipes :
Afin de faciliter davantage les processus d’apprentissage, les étudiants seront regroupés en équipes. Les équipes prépareront ensemble les documents assignés, feront des présentations et mèneront des discussions en classe.

B: References to compulsory readings (scientific journal articles, book chapters) will be given in class by the instructor. Other “compulsory” readings will be chosen by the students themselves, namely in order to develop their research projects.

****Because of the health evolution related to COVID-19, the study plans may be adapted during the semester.****

I: http://moodle.unil.ch/course/view.php?id=21782

HUMAN BEHAVIOR AND EVOLUTIONARY INFERENCE

Charles Efferson

C	Opt	4	English
A	6.00		

N: Master

B: The class will draw extensively from the primary academic literature in economics, psychology, anthropology, sociology, social policy, management, and evolutionary ecology. References will be provided with the lectures on a weekly basis during the first half of the term.

I: http://moodle.unil.ch/course/view.php?id=22390

LEADERSHIP DEVELOPMENT

Samuel Bendahan

C	Opt	2	English
A	3.00		

N: Master

B: Required text: Day, D. V., & Antonakis, J. (Eds.). (2012). The Nature of Leadership (2nd ed.). Thousand Oaks, CA: Sage Publications.

Articles (available for download on the course website in Moodle).

MANAGERIAL DECISION MAKING

Ulrich Hoffrage

C	Opt	4	English
A	6.00		

N: Master

P: De l'intérêt pour le sujet du cours. Inscription sur le moodle. Aucune limite concernant le nombre d'étudiants.

O:
- Identifier les phases du processus de prise de décision
- Reconnaître les pièges dans chacune de ces phases
- Apprendre divers outils et techniques pour favoriser la prise de décisions rationnelles.
- Apprendre les types de négociations.
- Apprendre à accroître les chances de faire une bonne affaire lors d'un négociation.

C: Faire du business consiste à prendre des décisions, souvent risquées, généralement avec des informations incomplètes, et trop souvent en moins de temps qu'il n'en faudrait. La prise de décision est une compétence managériale souvent tenue pour acquise, mais faire de bonnes décisions n'est pas aussi facile que certains se plaisent à penser. Ce cours a pour but de familiariser les étudiants aux approches importantes de la prise de décision, et de ce fait autant les théories descriptives que les outils prescriptifs seront abordés. De plus, divers sujets pertinents pour les manageurs en tant que preneurs de décisions seront discutés; par exemple, les intuitions, les processus de groupe, l'impact du temps et de la pression des délais, l'expérience, la responsabilité, l'éthique, et bien d'autres. Plusieurs exemples, études de cas et exercises illustreront comment ces divers outils peuvent être appliqués pour améliorer la prise de décision managériale, et à quel point diverses approches théoriques sont utiles pour comprendre ce que les manageurs font en réalité.

Une attention particulière sera accordée aux négociations. Une négociation peut être considérée comme l'interaction d'au moins deux parties dont les intérêts ne sont pas les mêmes et qui doivent porter des jugements et prendre des décisions lorsqu'elles tentent de trouver un accord. Nous examinerons les différents types de négociations et apprendrons les tactiques/stratégies de négociation. En particulier, cette partie du cours sera très pratique, c'est-à-dire qu'elle comprendra de nombreuses négociations et exercices réels en classe, mais aussi des cas réels (qui ont été documentés à des fins pédagogiques).

Organisation du cours (et ajustements corona):
Nous commencerons avec la première session le 21 septembre dans l'Anthropole 2013. Le plan actuel est d'organiser des sessions physiques en présence chaque semaine, bien que l'incertitude quant aux développements futurs puisse nous imposer certaines contraintes et nous obliger à être flexible. Indépendamment de cette incertitude et de cette flexibilité, quelques éléments peuvent d'ores et déjà être affirmés et ne changeront pas : (1) La présence physique sur le campus ne sera à aucun moment nécessaire et l'absence ne sera pas pénalisée, raison pour laquelle le système de notation ne comporte pas de composante pour la contribution. (2) Les sessions seront enregistrées et les enregistrements seront disponibles sur le moodle du cours. (3) Il n'y aura pas d'examen en présence à la fin du semestre, mais plutôt un projet final à réaliser en janvier 2022 et qui sera centré sur un cas de prise de décision.

Pour beaucoup, sinon la plupart des problèmes de décision, il est difficile, voire impossible, de déterminer quel serait le processus ou la décision optimale. Par conséquent, ce cours implique non seulement des cours magistraux et de la théorie, mais aussi des discussions, des arguments et des controverses. Pendant certaines semaines, une série de vidéos sera mise en ligne avant le cours. Vous devrez regarder ces vidéos avant la session respective, préparer les devoirs correspondants et les télécharger sur la plateforme moodle avant la date d’échéance. Les devoirs doivent être faits soit individuellement, soit en groupe (la composition de certains de ces groupes impliquera un élément aléatoire). La plupart des devoirs seront discutés en classe. Nous aurons vraisemblablement (a) un groupe d’étudiants qui viendra en classe chaque semaine, (b) un autre qui suivra à distance mais en temps réel, et (c) un autre encore qui ne regardera les enregistrements des sessions que plus tard. Il est fortement recommandé de venir en classe et - particulièrement après ces derniers semestres "corona" - d'apprécier les opportunités offertes par les interactions en face à face. De plus, le groupe (b) est fortement privilégié par rapport au groupe (c). Nous ne pouvons certainement pas vous garantir une expérience d'apprentissage complète et de qualité si vous appartenez au groupe d’étudiant qui privilégie l’option (c) - et même le fait d'appartenir au groupe d’étudiant qui privilégie l’option (b) s'accompagnera de certaines restrictions (par exemple, vous ne pourrez pas écouter les discussions en classe et les questions posées par vos camarades).

B: The course is largely (but not exclusively) based on the following literature. Some parts are required, others are recommended, more detailed information will be provided in the class.

Russo, J. E. & Schoemaker, P. J. H. (2002). *Winning decisions: Getting it right the first time.* New York: Currency/ Doubleday.

Book review (of Russo & Shoemaker) by Patric Andersson (2003). Journal of Economic Psychology, 24, 795-797 (http://www.sciencedirect.com/science/article/B6V8H- 48V83GT-3/2/21062afe8a7aba5be6d3914e0955c2f7)

Bazerman, M. H. (2006). *Judgment in managerial decision making* (6th ed.). New York: Wiley.

Hammond, J. S., Keeney, R. L., & Raiffa, H. (1999). *Smart choices: A practical guide to making better decisions*. New York: Broadway Books.

Galotti, K. M. (2002). *Making decisions that matter: How people face important life choices.* Mahwah, NJ: Erlbaum.

Halpern, D. F. (2002). *Thought and Knowledge: An introduction to critical thinking.* Lawrence Erlbaum Assoc. Inc.

Hoffrage, U., & Marewski, J. (2015). Unveiling the Lady in Black: Modeling and aiding intuition. *Journal of Applied Research in Memory and Cognition*, 4, 145–163.

Klein, G. (2004). *The power of intuition: How to use your gut feelings to make better decisions at work*. New York: Currency/Doubleday.

Hogarth, R., (2001). *Educating Intuition*. Chicago: University of Chicago Press.

Gigerenzer, G. (2007). *Gut feelings*: The intelligence of the unconscious. New York: Viking Press. (Translated in 17 languages, so probably also in your native language).

Nutt, P.C. (1989) *Making tough decisions: tactics for improving managerial decision making*. San Francisco: Jossey-Bass Publishers.

Fisher, R., Ury, W. L., & Patton, B. (2011). *Getting to yes: Negotiating agreement without giving in*. Penguin.

Inside Risk. A documentary of a kidnapping case, with a focus on the negotiation with the kidnappers, (not publicly available).

I: http://moodle2.unil.ch/course/view.php?id=5140

ORGANIZATIONAL THEORY AND DECISION MAKING

Christian Zehnder

C	Opt	4	English
A	6.00		

N: Master

I: http://moodle.unil.ch/course/view.php?id=22208