Course directory 2022.2023

school of biology (FBM-BIO) master

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

UNIL | Université de Lausanne

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/**

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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
2022-2023

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

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

For specialisation Behaviour, Economics and Evolution (BEE) (30 ECTS), the student must obtain :
18 ECTS : with Compulsory interdisciplinary courses in module 1 and 3 (marked in blue)
12 ECTS : with Optional courses in module 3 at least 3 ECTS with Disciplinary optional courses (marked in green) and at least 6 ECTS with Interdisciplinary optional courses (marked in blue)
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)

MODULE 1

Courses / Enseignements	Hours per semester C	E/S	PW	Teaching Staff	ECTS Credits	Limited nb of students
Compulsory Courses / Enseignements obligatoires						
Data Analysis *Analyses de données*	6	-	6	**Bergmann S.**	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.**, Gizatulina A.	6	
Subtotal	69	9	6		**10**	
Optional Courses / Enseignements optionnels						
Advanced Data Analysis *Analyses de données : niveau avancé*	6	-	6	**Ciriello G.**, Delaneau O.	2.5	
Animal Communication and Parasitism *Communication animale et parasitisme*	14	-	-	**Christe P.**, Roulin A.	1.5	
Introduction to Primate Behaviour, Cognition and Culture *Introduction au comportement, à la cognition et à la culture des primates*	8	6	-	**van de Waal E.**	1.5	
Molecular Methods in Ecology and Evolution *Méthodes moléculaires en écologie et évolution*	18	-	42	**Sanders I.**, Fumagalli L. Salamin N.	5	
Phylogeography *Phylogéographie*	7	10	-	**Fumagalli L.**	1.5	
Population Genetics and Dynamics *Génétique et dynamique des populations*	7	10	-	**Goudet J.**	1.5	
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.**	-	
Total					**15**	

MODULE 2

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

Interdisciplinary courses marked in blue

* 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

LIST OF COURSES

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

Sven Bergmann

C	Obl/Opt	English	6
A	2		

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		

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			

N: Master

O: This course provides an introduction to microeconomics, game theory, and industrial organization. Economics is a social science, offering a coherent theory with the aim to explain human behavior. Students learn to `think like an economist' and to apply the theory to real world problems. The course contains both a graphical and intuitive approach and the basic analytical tools necessary to understandand microeconomic models and to solve microeconomics optimization problems.

C: The course will cover the following topics

• Microeconomics

– Consumer behavior
– Firm behavior
– Supply and demand in competitive markets
– Welfare theorems
– Externalities

• Game theory

– Strategic interaction
– Static games of complete information
– Dynamic games of complete information
– Repeated games

• Industrial organization

– Imperfect competition, monopoly, oligopoly
– Price discrimination
– Cartel formation

ADVANCED DATA ANALYSIS

Giovanni Ciriello

C	Obl/Opt	English	6
A	2.5		

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

ANIMAL COMMUNICATION AND PARASITISM

Philippe Christe

C	Opt	English	14
A	1.5		

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 sur internet (http://perunil.unil.ch/perunil/periodiques/).

I: Aucune

INTRODUCTION TO PRIMATE BEHAVIOUR, COGNITION AND CULTURE

Erica Van de Waal

C	Opt	English	8
A	1.5		

S	Opt	English	6
A			

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.
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.

MOLECULAR METHODS IN ECOLOGY AND EVOLUTION

Luca Fumagalli, Ian Sanders

C	Obl/Opt	English	18
A	3.5/5		

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.

PHYLOGEOGRAPHY

Luca Fumagalli

C	Opt	English	7
A	1.5		

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	1.5		

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, with a particular emphasis on inbreeding depression and genetic rescue
website:
http://www2.unil.ch/popgen/teaching/PGD21

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:
-When and how can a small population purge deleterious alleles?
-How can we quantify Inbreeding Depression?
-is neutral diversity a good proxy for the health status of a population?

I: http://www2.unil.ch/popgen/teaching/PGD21/

SPATIAL ANALYSIS AND GIS IN ECOLOGY

Antoine Guisan

E	Obl/Opt	English	10
A			

C	Obl/Opt	English	7
A	1.5		

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 S			

TP	Opt	English	20
A S			

N: Master

FIRST STEP PROJECT

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

TP	Obl	English	224
A	15		

TP	Obl	English	280
A	15		

TP	Obl	English	250
A	14		

TP	Obl	English	224
A	15		

TP	Obl	English	224
A	15		

TP	Obl	English	224
A	15		

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 / Enseignements	Hours per semester C	E/S	PW	Teaching Staff	ECTS Credits	Limited nb of students
Compulsory Courses / Enseignements obligatoires						
Behaviour, Economics and Evolution Lecture Series (HEC) *Séminaires BEE*	10	10	50	**Lehmann L.**, Santos-Pinto L.	6	
Environmental Economics (HEC) *Economie environnementale*	56	-	-	**Houde S.**	6	
Subtotal	84	10	50		**12**	
Disciplinary Optional Courses / Enseignements optionnels disciplinaires *						
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	
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	
Phylogeny and Comparative Methods *Phylogénie et méthodes comparatives*	14	14	-	**Salamin N.**	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., Ythier M.	3	8
Scientific Mediation and Communication - Museum Module *Communication et médiation scientifique - module musée*	6	-	22	**Glaizot O.**	3	6
Sex, Ageing and Foraging Theory *Théories et modèles de l'évolution de la reproduction sexuée, la sénescence et la consommation de ressources*	9	-	9	**Mullon C.**	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 Field Courses (Financial participation by the student required) ***Etudes de terrain optionnelles***						
Biological Conservation of the Mediterranean Region *Biologie de la conservation dans les régions méditerranéennes*	-	-	40	**Roulin A., Christe P., Fumagalli L.**	2	
Drivers of Invertebrate Biodiversity along Ecological Gradients *Facteurs déterminant la biodiversité des invertébrés le long de gradients écologiques*	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*	-	-	52	**Guisan A.**	3	

Interdisciplinary courses marked in blue
Disciplinary courses marked in green

* - Before choosing an optional course, please check the "programme requirement" (prerequisites for the course) in the course description
- To complete the acquisition of the credits, it is possible to take optional courses from the module 1 during the third semester depending on their availability and only with the approval of the head of the Master

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

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MODULE 3

Courses / Enseignements	Hours per semester C	E/S	PW	Teaching Staff	ECTS Credits	Limited nb of students
Interdisciplinary Optional Courses / Enseignements optionnels interdisciplinaires *						
Heuristic Decision Making Strategies *Stratégie heuristique de prise de décision*	56	-	-	**Neth H.**	6	
Neuro Economie (HEC - in french) *Neuro économie*	56	-	-	**Villa A.**	6	
Organizational Behavior (HEC - in french) *Comportement organisationnel*	28	-	-	**Bastardoz N., Kleinbauer T., Dietz J.**	3	
Political and Institutional Economics (HEC) *Economie politique et institutionnelle*	56	-	-	**Rohner D.**	6	
Behavioral Economics (HEC - autumn) *Comportement économique*	56	-	-	**Santos-Pinto L.-P.**	6	
Development Economics (HEC - autumn) *Economie de développement*	56	-	-	**Esposito E.**	6	
General Approach to Management (HEC - in french - autumn) *Approche générale du management*	28	-	-	**Castaner X., Conti A., Bienz P.**	3	
Human Behavior and Evolutionary Inference (HEC - autumn) *Comportements humains et évolution*	56	-	-	**Efferson C.**	6	
Leadership Development (HEC - autumn) *Le développement du leadership*	28	-	-	**Bendahan S.**	3	
Managerial Decision Making (HEC - autumn) *Prise de décision managériale*	56	-	-	**Armaos K.**	6	
Organizational Theory and Decision Making (HEC - autumn) *Théorie et prise de décision organisationnelle*	56	-	-	**Zehnder C.**	6	
Total					**30**	

Interdisciplinary courses marked in blue

* - Students can choose other HEC optional courses independently from this study plan with the approval of the head of BEE specialisation
- To complete the acquisition of the credits, it is possible to take optional courses from the module 1 during the third semester depending on their availability and only with the approval of the head of the Master

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

MODULE 4

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

The pandemic has shown us that circumstances beyond our control may require us to make the following adjustments / adaptations to study plans during the semester:

- 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).
- change / modification 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		

S	Obl	English	10
S			

TP	Obl	English	50
S			

N: Master

ENVIRONMENTAL ECONOMICS

Sébastien Houde

C	Obl	4	English
S	6		

N: Master

P: Introduction to microeconomics and econometrics (or applied statistics)

O: Environmental economics is at the forefront of the response to local, national and global environmental problems and as such it has become an essential part of the thinking and actions of national and regional governments, international agencies, and firms.

The goal of this course is to introduce the theory and tools necessary to address environmental problems using the economic approach. At the end of the course, students would be able to conduct a rigorous economic analysis of an environmental problem.

C: This class is divided in two complementary parts. Each week (approx. 2h/week), we will first cover the theoretical aspects underpinning the economic analysis of environmental problems and policies. The focus of the theory will be on cost-benefit analysis and market-based policies. The second part of the class (approx. 2h/week) will take the format of a lab and focus on applying the environmental economic approach to real-world problems. Students will have to find their own problem to work on, collect data, and perform theoretical and empirical analysis throughout the semester.

B: Course material is based on the combination of lecture notes, presentations, book material and academic journals. They will be uploaded every week.

One useful book (but not mandatory) is Kolstad, C., Environmental Economics, New York: Oxford University Press, 2000.

I: http://moodle.unil.ch/course/view.php?id=26696

APPLIED ECOLOGY

Jérôme Pellet

C	Opt	English	14
S	3		

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.
After this lecture, students are able to understand the underlying concept of evidence-based conservation and adaptive management. They have applied the concepts in several different conservation settings.

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	1.5			

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 such as climate 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	1.5			

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	1.5		

E	Opt	English	7
S			

N: Master

O: An introduction to central topics and questions in comparative genomics and molecular evolution

C: 1. Intro
A. what is a genome and the concept of heredity?
B. broad differences in the tree of life
C. principle factors influencing genome architecture
D. are genomes optimized? (early thoughts on selection)
2. Population Variation vs. Divergence: how do genetic changes arise?
3. Evolution of Genome Architecture
4. Origin of New Genes
5. Evolution of Gene Families
6. Evolution of Transcriptomes
7. Single Cell Transcriptomics
8. (depending on time) Ancient DNA and Evolution

CURRENT PROBLEMS IN CONSERVATION BIOLOGY

Claus Wedekind

C	Opt	English	14
S	3		

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	1.5		

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

HONEYBEE ECOLOGY, EVOLUTION AND CONSERVATION

Vincent Dietemann

C	Opt	English	14
S	1.5		

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	1.5		

N: Master

P: none

O: To obtain a multidisciplinary knowledge basis on aspects of ecology & evolution of mountain ecosystems

C: General introduction to mountain environments
Adaptations to marginal environments
Reproductive systems along elevation
Patterns of micro-organisms along elevation
Biological invasions in mountains
Impact of climate change on mountain biota - field observations and experiments
Impact of climate change on mountain biota - spatial modelling
Human-wild fauna conflicts in mountain regions

B: Donnée séparément pour chaque leçon.

I: Planning détaillé donné sur moodle aux étudiant.e.s inscrit.

INTEGRATED COURSE MOUNTAIN ECOSYSTEMS - GEO-ENVIRONMENTAL SCIENCES

Antoine Guisan

C	Obl/Opt	English	14
S	1.5		

N: Master

P: None

O: To obtain a multidisciplinary knowledge basis on aspects of geosciences & environment of mountain ecosystems

C: Mountain Topoclimatology - the case of the Alps
Geology of the Alps
Glaciers in the Alps, recession, and climate change
The hydrology of mountain basins
Mountain lakes
Sediment flux in mountain basins
Geomorphology of Alpine areas
Pollutant release by glaciers, lake contamination, impact on biodiversity
Evaluating risks of natural hazards
Mountain soils
Remote Sensing of Mountain Ecosystems
Separate bibliography for each sub-topic

B: Donnée séparément pour chaque leçon.

I: Voir moodle pour étudiant.e.s inscrit.e.s

PHYLOGENY AND COMPARATIVE METHODS

Nicolas Salamin

C	Opt	English	14
S	3		

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

SCIENTIFIC COMMUNICATION - SCIENTIFIC HANDS-ON WORKSHOP MODULE

Alain Kaufmann, Philippe Reymond

C	Opt	French	14
S	3		

E	Opt	French	14
S			

N: Master

SCIENTIFIC MEDIATION AND COMMUNICATION - MUSEUM MODULE

Olivier Glaizot

C	Opt	English	6
S	3		

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, 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.

SEX, AGEING AND FORAGING THEORY

Charles Mullon

C	Opt	English	9
S	1.5		

TP	Opt	English	9
S			

N: Master

P: Ability to program in R or other languages.

O: Introduction to theoretical principles and modelling approaches to fundamental problems in evolutionary ecology.

Understand the biological factors that influence the evolution of ageing, sex, and resource consumption.

Learn to conceptualise a biological problem and analyse it quantiatively.

Introduction to individual-based simulations.

C: We explore the evolution of sexual reproduction, ageing and resource consumption, through three big questions:

<p id="yui_3_17_2_1_1674222015810_171">1. Why do we age? <p id="yui_3_17_2_1_1674222015810_199">2. Why do we reproduce sexually?
3. How should we consume resources?

We look at these questions through mathematical and computational modelling. In addition to core concepts of evolutionary ecology, students thus learn how to formalize a theoretical model, implement it in a computer program (e.g. R, C or Python) and analyse its output.

SPATIAL MODELLING OF SPECIES AND BIODIVERSITY

Antoine Guisan

C	Opt	English	14
S	3		

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

THE EVOLUTION OF COOPERATION : FROM GENES TO LEARNING AND CULTURE

Laurent Lehmann

C	Opt		English	28
S	3			

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.

BIOLOGICAL CONSERVATION OF THE MEDITERRANEAN REGION

Alexandre Roulin

T	Opt		English, French	40
A S	2			

N: Master

P: Financial participation required by the student.

O: Faunistic knowledge on birds, insects, crustaceans, mammals and reptiles with an emphasis on conservation issues. We will visit several places (Extermadura, Andalucia around the Doñana national parc, Tarifa and Brazo del Este) where the fauna is fundamentally different and habitats have suffered from human activities to different degrees.

C: Excursions and group field work. Discussion of scientific articles about conservation issues of Spanish endangered species. Additionnally, each student shall be responsible for the study of one endangered species. Discussion of projects that could be carried out in Spain to answer questions on evolutionary biology, behavioural ecology and conservation.

B: Polycopié distributé aux participants

DRIVERS OF INVERTEBRATE BIODIVERSITY ALONG ECOLOGICAL GRADIENTS

Tanja Schwander

C	Opt	English	7
S	3		

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

EVOLUTION AND BIOGEOGRAPHY OF SEMI-ARID AND ISLAND FLORAS

John Pannell

T	Opt	French	40
S	2		

N: Master

P: Financial participation required by the student.

INTEGRATED PRACTICAL WORK MOUNTAIN ECOSYSTEMS IN THE ALPS

Antoine Guisan

T	Obl/Opt	English	52
S	3		

N: Master

P: Having followed at least one of the two associated lecture series (GE or EE).

O: The objectives are four-fold:
- be able to carry out a small research project from beginning to end.
- Learn to work in interdisciplinary team: groups of 5 students from the FBM and FGSE (if possible at least one FGSE student per group).
- be able to efficiently and elegantly communicate your scientific findings (oral and written).
- learn how to carry ecological field work.

C: Two field retreats in Arolla (VS) - usually in May (2 days) and July (4.5 days)
First retreat to design a project and write a proposal
Second retreat to conduct the project in the field, and write a final report ("paper style")
Instructions on the two retreats' programs and the expected proposal and final report on moodle.
Bibliography:
Differents species identification field guides.
Bowman, W. D., and T. R. Seastedt, editors. 2001. Structure and Function of an Alpine Ecosystem : Niwot Ridge, Colorado. Oxford University Press Inc New York.
Nagy, l., and G. g. 2009. The biology of alpine habitats. Oxford University Press, Oxford.
Körner, C. 2003. Alpine plant life: Functional plant ecology of high mountain ecosystem. 2nd Edition edition. Springer, New York.
Ozenda, P. 1985. La végétation de la chaîne alpine dans l'espace montagnard européen. Masson, Paris.

B: Différents guides d'identification d'espèce sur le terrain.
Bowman, W. D., and T. R. Seastedt, editors. 2001. Structure and Function of an Alpine Ecosystem : Niwot Ridge, Colorado. Oxford University Press Inc New York.
Nagy, l., and G. g. 2009. The biology of alpine habitats. Oxford University Press, Oxford.
Körner, C. 2003. Alpine plant life: Functional plant ecology of high mountain ecosystem. 2nd Edition edition. Springer, New York.
Ozenda, P. 1985. La végétation de la chaîne alpine dans l'espace montagnard européen. Masson, Paris.

I: Info détaillées sur moodle pour étudiant.e.s inscrit.e.s

HEURISTIC DECISION MAKING STRATEGIES

Julian Marewski

C	Opt	4	English
A	6		

N: Master

P: This course does not come with specific requirements in terms of prior knowledge and skills. The course is open to both students who are completely unfamiliar with the decision sciences as well as to students who have had ample prior exposure to corresponding research.

O: How do humans make decisions under uncertainty? How should they best make them? Strategies for making smart decisions under uncertainty are fast-and-frugal heuristics. Surprisingly, heuristics have applications in many different areas, ranging from leadership and strategy in the business world to military combat, aviation, sports, and medicine. And heuristics may not only guide human behavior but also that of other animals. This course offers an overview of inter-disciplinary research on heuristic decision making strategies, bringing together human psychology with business and economics, biology, history, and other fields.

Target audiences:

- Master students who wish to discover the world of research, or who might be interested to pursue doctoral studies, or who wish to prepare themselves for writing their Master thesis.
- PhD students who wish to take this course as part of their PhD studies.

This course will:

- acquaint students with theoretical and methodological foundations of research on heuristics,
- introduce different application areas, and
- allow students to focus on one application area that is of specific interest to them.

C: Research on heuristics focuses on four interrelated questions. Descriptive: What heuristics do humans and other animals use? Ecological: In what environment does each heuristic yield clever decisions, and when will it fail? Applied: How can decision making be improved, for instance, by changing the heuristics people rely upon? Methodological: How can heuristics be studied?

After an overview on different theories of decision making, we will start out by searching for answers to the descriptive, ecological, and methodological questions. Thereafter, we will cover different areas of applied research. Finally, students will dig deeper into a topic of their own choice. Within the chosen areas of specialization, students will develop a research project. Tangible outcome of this project development phase include formulating a research proposal or, for advanced students (e.g., PhD students), the possibility of doing actual empirical work, to be written up in a project report (e.g., a short journal article draft).

Thus, the course can be divided into two main parts:

1. Academic discussion seminar: We will read selected articles and book chapters and then discuss those together in class.

2. Developing a research project: Students will discuss their project ideas, get feedback from the class and the instructor, and work on their project.

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

I: http://moodle.unil.ch/course/view.php?id=27923

NEURO ECONOMIE

Alessandro Villa

C	Opt	4	French
S	6		

N: Master

P: None

O: This course is intended for students who wish to acquire the principles of constraint management and decision-making from a perspective inspired by the latest discoveries in neuroscience, cognitive science and biology.

The goal is to provide practical reference points for the various actors in the economics about the functioning of the brain according to a neuroeconomic 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 in particular the structures and brain mechanisms that are the basis of the cognitive, motor and emotional factors of behavior. A large part of the course is devoted to the illustration of concrete examples and neuroscience experiments and the description of the methodological approach, in particular neuropharmacological. Several chapters deal with the organization and characteristics of the main modulatory pathways of brain activity and their influence in neuroeconomics.
A work of synthesis and bibliographical research will be assigned to the students in small groups who will have to submit a written report which will be the subject of an evaluation counting for the exam mark, as well as by an oral presentation in class of this same research which will also count for the exam score.

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 is limited. The group work is based on a maximum number of 12 groups, that is approximately 36-40 students maximum.

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.

15. M.A. Paradiso, M.F. Bear, B.W. Connors - **Neuroscience: exploring the brain** – Hagerstwon, MD:/ Lippincott Williams & Wilkins, 2015, 4th edition

16. M. Gazzaniga, R. Ivry, G, Mangun, G. - **Cognitive Neuroscience, The Biology of the Mind** - W.W. Norton & Company, Inc, 2015, 4th edition.

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

COMPORTEMENT ORGANISATIONNEL

Jörg Dietz

C	Opt	2	French
S	3		

N: Master

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		

C		2	English
A			

N: Master

P: The course is open to all students of the Master in Economics, and to other interested students who have basic mathematical knowledge (e.g. doing maximization under constraint).

O: This course provides a graduate-level introduction to Political and Institutional Economics. The focus lies on explaining how democratic politics and electoral competition crucially matter for economic incentives, and how institutions and governance are key factors for development and for curbing the risk of conflict.

After providing a solid theoretical background to the students, we shall study cutting-edge empirical articles on these topics. Part of these recent influential articles will be discussed in student presentations.

The primary goal of the course is to familiarize the students with this increasingly important subfield of economics and to provide an overview on what cutting-edge research is currently carried out on these topics. A secondary goal of the course is also to foster the applied econometrics and oral presentation skills of the students.

C: This course covers the following topics:

SECTION 1: THE BIG PICTURE: ORIGINS OF THE STATE

- Market Failures and the efficiency arguments for the state
- Redistribution arguments for the state
- State Failure and bad politicians

SECTION 2A: DEMOCRATIC POLITICS AND THE ECONOMY: THEORY

- Downsian electoral competition and Median Voter Theorem
- Probabilistic voting
- Lobbying, rent-seeking and Special interest policy
- Bureaucracy
- Partisan politics: "citizen candidate" and "legislative bargaining"

SECTION 2B: DEMOCRATIC POLITICS AND THE ECONOMY: EMPIRICS

- Incumbency advantage
- Direct democracy
- Political dynasties
- Identity of leaders
- Information, voting and public policies

SECTION 3A: INSTITUTIONAL ECONOMICS AND GOVERNANCE: THEORY

- Inequality and Institution Building
- Determinants of State Capacity
- Institutions and Development

SECTION 3B: INSTITUTIONAL ECONOMICS AND GOVERNANCE: EMPIRICS

- Historical origin of institutions and path dependency
- Ethnic diversity and institutions
- Inequality and institutions
- Institutions and development

SECTION 4A: ECONOMICS OF CONFLICT: THEORY

- War inefficiency puzzle
- Contest success functions and paradox of power
- Political bias and war
- Ethnic conflict
- State capacity and conflict

SECTION 4B: ECONOMICS OF CONFLICT: EMPIRICS

- Ethnic diversity, discrimination and conflict
- Natural resources, climate change and conflict
- Political institutions and conflict
- Policies for Peace
- Economic and political consequences of conflict

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		

N: Master

P: Microeconomic Theory (Analyse économique: Microéconomie)

O: In the last three decades there has been a behavioral revolution in Economics and Finance. This revolution came into age when the 2002 Nobel Prize in Economics was attributed to Daniel Kahneman and Vernon Smith. In 2017, Richard Thaler won the Nobel prize in Economics for his innovative and pathbreaking research in Behavioral Economics. Courses in Psychology and Economics, Behavioral Economics, or Behavioral Finance are now offered regularly in most top US and European graduate programs and many students choose to specialize in these fields. The purpose of this course is to make masters students at UNIL acquainted with both seminal contributions as well as frontier research in Behavioral Economics.

C: 1. Introduction 1.1. What is Behavioral Economics? 1.2. Five Lessons from Behavioral Economics

2. Choice under Uncertainty 2.1. Expected Utility Theory 2.2. Behavioral Facts 2.3. Behavioral Theories 2.4. Rank Dependent Utility 2.5. Prospect Theory 2.6. Reference-Dependent Preferences 2.7 Salience Theory

3. Buyers, Sellers and Markets 3.1. The Endowment Effect 3.2 Explaining the Endowment Effect 3.3. Applications of Loss Aversion 3.4. Bounded Rationality 3.5. Obfuscation and Information Suppression

4. Intertemporal Choice 4.1. The Standard Dynamic Decision Theory Model 4.2. Behavioral Facts: Self-Control Problems, Preference for Immediate Gratification 4.3. Quasi-Hyperbolic Discounting 4.4. Applications: Addiction, Savings, Obesity, Smoking, Contract Design and Self-Control 4.5. Other Approaches to Intertemporal Choice

5. Self-Confidence and Motivation 5.1. Behavioral Facts 5.2. Behavioral Theories 5.3 Applications: Markets and Organizations

6. Conclusion 6.1. Appraisals of Behavioral Economics 6.2. Criticisms of Behavioral Economics 6.3. Where do We Go from Here?

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=27268

DEVELOPMENT ECONOMICS

Resuf Ahmed, Dzhamilya Nigmatulina

C	Opt	4	English
A	6		

N: Master

P: Econometrics (linear regression models, panel data), Intermediate Microeconomics (production theory, consumption theory)

O: **Instructors**:

Dzhamilya Nigmatulina (Lecturer), Resuf Ahmed (Charge de Cours), Utsoree Das (TA)

This course seeks to study the development of economy through the lens of macroeconomic models and microeconomic data. It includes the topics of measurement of economic development, the movement of the economy across the sectors of agriculture, manufacturing and services as countries grow, distribution and reallocation of resources across sectors and across firms at different stages of the development process. The course will also explore microeconomics foundations of the development process and ask questions: What constraints do households and firms in less developed countries they face? Is there scope for policy to ease these constraints?

In addition, the course will develop familiarity with a set of econometric techniques widely used by researchers and development practitioners.

C: Using a mix of micro and macro approaches, the course will come in two parts:

Macro-development, where the examples of topics will be:

i) Development accounting: methods and findings ii) Structural transformation iii) Firm-level misallocation iv) Urbanization, trade and development

Micro-development, where the examples of topics will be:

i) inequality ii) education iii) health iv) access to finance

To study these topics, we will identify a set of analytical frameworks, grounded in economic theory, and verify them with rigorous empirical evidence.

B: Reading List examples below. Full reading list will be assigned at the start of the course.

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

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

Restuccia, D., & Rogerson, R. (2017). The causes and costs of misallocation. *Journal of Economic Perspectives*, *31*(3), 151-74.

Hsieh, C. T., & Klenow, P. J. (2009). Misallocation and manufacturing TFP in China and India. *The Quarterly journal of economics*, *124*(4), 1403-1448.

Hsieh, C. T., Hurst, E., Jones, C. I., & Klenow, P. J. (2019). The allocation of talent and us economic growth. *Econometrica*, *87*(5), 1439-1474.

Ngai, L. R., & Pissarides, C. A. (2007). Structural change in a multisector model of growth. *American economic review*, *97*(1), 429-443.

Kongsamut, P., Rebelo, S., & Xie, D. (2001). Beyond balanced growth. *The Review of Economic Studies*, *68*(4), 869-882.

Hsieh, C. T., & Moretti, E. (2019). Housing constraints and spatial misallocation. *American Economic Journal: Macroeconomics*, *11*(2), 1-39.

Moretti, E. (2011). Local Labor Markets. Handbook of Labor Economics.

Donaldson, D. (2015). The Gains from Market Integration. *Annual Review of Economics*, *7*(1), 619-647.

I: http://moodle.unil.ch/user/index.php?id=27953

APPROCHE GÉNÉRALE DU MANAGEMENT

Pius V Bienz, Xavier Castaner

C	Opt	2	French
A	3		

N: Master

HUMAN BEHAVIOR AND EVOLUTIONARY INFERENCE

Charles Efferson

C	Opt	4	English
A	6		

N: Master

P: A master's level class in ecology and evolution. Additional coursework in behavioral economics, social psychology, and/or the evolution of social behavior would certainly be relevant and helpful but are not essential.

O: Human decision making and human behavior are ultimately biological. By extension, they are evolved. Evolutionary ecology arguably represents the only possible way to integrate the study of human behavior across disciplines ranging from anthropology to economics. In spite of this tremendous potential, controversy often plagues the study of basic questions related to evolution and human behavior. In the broadest terms, this class is an extended analysis of the potential of evolutionary analyses of human behavior, the reasons for persistent controversies, and strategies for how to make significant progress.
1) The class will examine how disciplinary and methodological diversity contribute to a specific set of intractable controversies. These controversies relate to (i) the role of culture and cultural evolution, (ii) the evolution of cognition and emotion, (iii) the implications of evolution for social policy, sustainability, and human well-being, (iv) the evolution of human cooperation, and (v) the evolution of harmful and destructive behaviors.
2) The class will also analyze whether the evolutionary study of human decision making and behavior presents unique challenges not present in other fields.
3) The class will introduce the concept of evolutionary inference, which refers to how we make claims about an evolutionary process that we typically cannot actually observe.
4) The class ask students to identify key methodological problems limiting progress and propose approaches for a definitive way forward.
5) More broadly, the class will help students develop their ability to identify fundamental problems and develop strategies for solving them.
6) Students will develop skills related to giving oral presentations and proposal writing.

C: The first half of the semester will involve a series of in-depth lectures on the following topics related to evolution and human behavior.
- The evolution of psychological systems, with a special emphasis on cognition and motivation. In particular, are evolved psychological systems biased in some way? Why, for example, are we scared of snakes but not cars? Do heterosexual men tend to think women are more interested in them romantically than these women actually are? If so, how could such a bias evolve? Has our psychology evolved in a way that predisposes us to believe in supernatural agents, and if so are we scared of these supernatural agents?
- How do cultures evolve, and what does cultural evolution have to do with evolution more broadly?
- Does cultural evolution shape genetic evolutionary processes, and if so how?
- Are humans really altruistic and distinctively cooperative, and if so how could such individually costly behaviors evolve? Is cultural evolution important with respect to these questions?
- What, if anything, can a policy maker who wants a better world and a better society learn from evolution? Similarly, what can a manager do to promote the diffusion of norms and technologies within an organization that are consistent with the manager's goal? Broader still, whether we are managers, government officials, or NGO workers, how can we recruit cultural evolutionary processes to accomplish specific social goals?
- How do we explain pervasive harmful behaviors and bad decision making from an evolutionary perspective? Why, for example, do some people harm their children? Why do entire groups of people believe things that are verifiably wrong? Why do societies persist in the use of sub-optimal technologies?
All of the above questions represent fundamental questions in the evolutionary study of human decision making and behavior. All of them receive widespread attention from large numbers of highly trained researchers. That said, all of them suffer from persistent disagreement and controversy. This controversy, and the reasons for it, will serve as a key organizing theme for the class. In particular, the second half of the semester will invite students to pick a specific problem from the list and examine the reasons for the controversy surrounding this problem. The basic task will be to isolate the methodological issues that allow controversy to persist and then propose a scientific strategy for making real progress.
Accordingly, students will present oral presentations of their work during the second half of the term. These presentations and associated feedback - feedback from both the other students and from the instructors - will allow students the opportunity to refine and improve their ideas. The final assignment for the class will be a research proposal based on the presentation and associated feedback. The ultimate task is to pick a controversy, isolate the problem, and propose an approach that will allow definitive progress.

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=27547

LEADERSHIP DEVELOPMENT

Samuel Bendahan

C	Opt	2	English
A	3		

N: Master

P: None.

O: Students will learn about leadership and about developing their leadership potential. A substantial portion of the variation in organizational (and subordinate) outcomes can be attributed to leadership. As such, this course is designed to provide students with a comprehensive understanding of leadership as a phenomenon and its impact on the organizational behavior of individuals. Students will learn to think critically about leadership, the boundary conditions of leadership theories, and how to better influence others. The class will focus both on theoretical knowledge and on practice.

C: The class will discuss the following topics (theory sessions):

- Introduction to leadership
- Decision-making and its importance in leadership development
- Motivation
- Charisma
- Full-range leadership theory
- Traits and leadership
- Gender and Leadership
- Leadership development in organizations
- Personal leadership development
- Ethics and leadership
- Power and corruption

The practical sessions will be oriented towards the developement and the application of concrete tools that can be used to improve one's leadership:

- Concrete tools a practical instructions that can be followed to improve one's leadership
- Specific tools will be presented and developed during class, based on empirical evidence
- Use of tools will be practiced during class and exercises.

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		

N: Master

P: (A) Very good use of English

(B) Interest in the topic

O: In this course, we will:

- Identify the different phases in the decision making process and learn about the traps in each of these phases,
- Learn about tools, strategies and techniques for making sound and rational decisions under conditions of risk and uncertainty,
- Learn about the cognitive biases and environmental constraints that undermine and limit our decisions,
- Learn about intuition and when to use it,
- Comprehend the complexity of decision making in a social world and learn how to minimize unwanted consequences,
- Learn about types of negotiations, and how to increase the chances for making a good deal in a negotiation, and
- Systematize and improve your decisions both in a personal and an organizational context.

C: Business revolves around making decisions, often risky decisions, usually with incomplete information and too often in less time than desirable. Decision-making is a business skill that managers often take for granted in themselves and others, but it is not as easy as some might think. In fact, just like with breathing, walking, and eating, we all do it, but some people do it better than others; some are experts while others harm themselves and others in the process.

This course will familiarize students with important theoretical approaches to decision making, aiming at providing them with a clear understanding of the field, while at the same time training them at becoming better and more conscious decision makers.

For many decision problems it is hard or even impossible to determine what the optimal process and decision would be. As a consequence, this course involves not only lecturing and theory, but also discussion, arguments and controversies. Several examples, case-studies and in-class activities will illustrate how various tools can be applied to improve managerial decision making and to what extent various theoretical approaches are useful to understand what managers are actually doing.

Topics (subject to change):

1. **Introduction:** Course overview, history of Judgment and Decision Making, your own cases.
2. **Decision-making basics:** processes, types & strategies, risk vs uncertainty.
3. **Decisions under risk:** Expected Value, framing & decision trees, Expected Utility & Prospect Theory.
4. **Heuristics and Biases**: cognitive biases, dual-process theories.
5. **Fast and Frugal Heuristics**: bias-variance dilemma, overfitting, less-is-more, ecological rationality, fast-and-frugal trees.
6. **Decision making in the digital world**: misinformation, debunking & digital heuristics, piracy & cybersecurity.
7. **Intuition and experts**: experience, expertise and intuition.
8. **Decision making under uncertainty, luck, and consulting:** black swans & fat tails, tools (scenario planning, thresholds, resilience, cognitive mapping), luck - freedom of choice - happiness, and consulting.
9. **Group decision making**: accountability, ethics, leadership, groupthink, culture.
10. **Negotiation**: distributive and integrative types.
11. **Negotiation**: Inside Risk case, Mediation.

Organization of the course:

(1) Registration. There is no upper limit of students, everyone who is interested in the topic is welcome. Self-enroll on the moodle (and dont forget to unsubscribe if you, after some sightseeing, decide to not take this course). Even though this course will have no exam at the end, do not forget to register for this course at HEC's admin during the third week, in order to get the credits validated.

(2) Presence and contribution. To avoid clashes with the introductory week, this course will start in week 2, on Sept 26th, at 8:30, in Anthropole/2013. No live-straming and no recording throughout the entire semester. Even though class contribution will not be graded, students are expected to be actively present in class, ask and answer questions, participate in exercises and discussions.

(3) Weekly assignments. Throughout the semester, students will get weekly assignments (every submitted assignment will be graded, and the best seven will determine the grade for evaluation component 1, see below). These assignments can be completed alone or in pairs (for a few assignments also in groups of more than two). All weekly assignments will be discussed in class, typically during the next session after due date.

(4) Final project. There will be no sit-in exam at the end, but a final project, to be completed before January 15, 2024, that will be centered around a decision-making case of your choice. You can work on this project in groups of up to four students.

(5) Final assignment. You will be assigned to a few final projects of your peers. You have to analyse their projects, the solutions they came up with, and provide them with feedback. This will be your last assignment, it will be individually (no group work), and it will be graded.

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.

- Ariely, D., & Jones, S. (2008). Predictably irrational (pp. 278-9). New York: HarperCollins.
- Bazerman, M. H. (2006). *Judgment in managerial decision making* (6th ed.). New York: Wiley.
- Christakis, N. A., & Fowler, J. H. (2009). *Connected: The surprising power of our social networks and how they shape our lives*. Little, Brown Spark.
- Dobelli, R. (2013). *The art of thinking clearly: better thinking, better decisions*. Hachette UK.
- Fisher, R., Ury, W. L., & Patton, B. (2011). *Getting to yes: Negotiating agreement without giving in*. Penguin.
- Galotti, K. M. (2002). *Making decisions that matter: How people face important life choices.* Mahwah, NJ: Erlbaum.
- Gigerenzer, G., & Todd, P. M. (1999). *Simple heuristics that make us smart*. Oxford University Press, USA.
- *Gigerenzer, G*. (2007). *Gut feelings: The intelligence of the unconscious*. New York: Viking Press.
- Gigerenzer, G. (2015). *Risk savvy: How to make good decisions*. Penguin.
- Gilbert, D. (2009). *Stumbling on happiness*. Vintage Canada.
- Gladwell, M. (2006). *Blink: The power of thinking without thinking*.
- Halpern, D. F. (2002). *Thought and Knowledge: An introduction to critical thinking.* Lawrence Erlbaum Assoc. Inc.
- Hammond, J. S., Keeney, R. L., & Raiffa, H. (1999). *Smart choices: A practical guide to making better decisions*. New York: Broadway Books.
- 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.
- Hogarth, R., (2001). *Educating Intuition*. Chicago: University of Chicago Press.
- # Inside Risk. A documentary of a kidnapping case, with a focus on the negotiation with the kidnappers, (not publicly available).
- Kahneman, D. (2011). *Thinking, fast and slow*. Macmillan.
- Klein, G. (2004). *The power of intuition: How to use your gut feelings to make better decisions at work*. New York: Currency/Doubleday.
- Nutt, P.C. (1989) *Making tough decisions: tactics for improving managerial decision making*. San Francisco: Jossey-Bass Publishers.
- Russo, J. E. & Schoemaker, P. J. H. (2002). *Winning decisions: Getting it right the first time.* New York: Currency/ Doubleday.
- Schwartz, Barry. *The paradox of choice: Why more is less*. New York (2004).
- Taleb, N. N. (2007). *The black swan: The impact of the highly improbable*. Random house.
- Thaler, R. H., & Sunstein, C. R. (2009). *Nudge: Improving decisions about health, wealth, and happiness*. Penguin.

I: http://moodle.unil.ch/course/view.php?id=28218

ORGANIZATIONAL THEORY AND DECISION MAKING

Manuel Grieder

C	Opt	4	English
A	6		

N: Master

P: There are no particular prerequisites for this course.

O: A large part of economic activity takes place within firms. In modern economies the total value of within-firm transactions is approximately equal to that of market transactions and the worldwide value of mergers and acquisitions is in the trillions. Understanding why firms exist, why they grow or shrink over time, and how they operate is essential. The course builds on prominent approaches in organizational economics and combines theoretical concepts with empirical data (experiments, field data) and managerial decision-making (case studies). The central topics are governance choices (vertical integration and outsourcing) and the internal organization of firms (incentives, hierarchies, and leadership).

C: The course has two parts. In the first half of the course, we focus on governance choices. In this part we are interested in understanding why firms sometimes decide to vertically integrate (e.g. Netflix's decision to produce their own original content) and sometimes decide to outsource parts of their business (e.g. Acer's decision not to manufacture many of their products inhouse anymore). This discussion will lead us to some of the leading theories of the firm such as transaction cost economics and the property rights approach. Using a series of real-life case studies, we will examine how these theories can inform practical management decisions in the context of mergers and acquisitions and outsourcing. We will discuss some of these case studies together and you will work on other case studies in groups. You will put yourself in the shoes of a consulting team that prepares a presentation for the top management of a company.

The second half of the course concentrates on the internal organization of firms. A central problem in firms is that the natural incentives existing in pure market transactions are no longer present. We therefore discuss how managers can motivate their employees to operate in the interest of their firm. The principal-agent model delivers important insights on this issue. It illustrates how managers should structure compensation plans, which information they should use and how closely they should monitor their employees depending on the firm's technology, the characteristics of the work environment and the employee's preferences. Building on these basic principles for the provision of explicit incentives, we will extend the agency model and apply it to more complex and realistic environments where multi-tasking, teamwork and intertemporal spillovers make the motivation of workers difficult. We will see that in those contexts extrinsic motivation through rewards and sanctions alone will often not suffice to achieve the desired results. This leads us to a discussion of the role of social motives, norms and leadership. The case studies for the second part will be related to employee motivation problems in various industries and contexts.

B: All materials will be available on the course website.

I: http://moodle.unil.ch/course/view.php?id=27430