

MATH-463

**Mathematical modelling of behavior**

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Cursus	Sem.	Type
Civil & Environmental Engineering		Opt.
Civil Engineering	MA1, MA3	Opt.
Computational science and Engineering	MA1, MA3	Opt.
Financial engineering	MA1, MA3	Opt.
Ing.-math	MA1, MA3	Opt.
Mathématicien	MA1, MA3	Opt.
Statistics	MA1, MA3	Opt.

Language of teaching	English
Credits	5
Session	Winter
Semester	Fall
Exam	Written
Workload	150h
Weeks	14
<b>Hours</b>	<b>4 weekly</b>
Lecture	2 weekly
Exercises	2 weekly
<b>Number of positions</b>	

**Summary**

Discrete choice models allow for the analysis and prediction of individuals' choice behavior. The objective of the course is to introduce both methodological and applied aspects, in the field of marketing, transportation, and finance.

**Content**

1. Introduction and examples
2. Choice theory
3. Binary choice
4. Multinomial choice
5. Specification testing
6. Prediction
7. Nested Logit model
8. Multivariate extreme Value models
9. Sampling
10. Mixed models.
11. Choice models with latent variables.
12. Discrete choice and machine learning

**Teaching methods**

The course is a combination of ex-cathedra lectures and practical sessions. The practical sessions consist in exercises and laboratories. They are organized every week during the semester. The students will estimate the parameters of behavioral models based on real data.

**Assessment methods**

Graded projects must be delivered during the semester.  
A written exam is organized during the exam session.

**Resources****Moodle Link**

- <https://go.epfl.ch/MATH-463>