Mathematical modelling of behavior

Bierlaire Michel

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

MOOC
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.

Learning Outcomes

By the end of the course, the student must be able to:

• Model discrete choice

Transversal skills

• Use a work methodology appropriate to the task.
• Assess one’s own level of skill acquisition, and plan their on-going learning goals.
• Use both general and domain specific IT resources and tools

Teaching methods

Lectures:
The first half of the semester is based on the online MOOC “Introduction to discrete choice models”. There is no lecture in class. The second half of the semester is based on ex-cathedra lectures in class.
Exercises and laboratories:
They are organized every week during the semester. The students will estimate the parameters of behavioral models.
based on real data.

**Expected student activities**

Every week, the students are supposed to

1. read the appropriate material, according to the schedule (the material for a given week is supposed to be read before the lecture of that week);
2. work on the assignments for the laboratories.

**Assessment methods**

Written

Dans le cas de l’art. 3 al. 5 du Règlement de section, l’enseignant décide de la forme de l’examen qu’il communique aux étudiants concernés.

**Resources**

**Bibliography**


**Ressources en bibliothèque**

- Discrete Choice Analysis / Ben-Akiva
- Discrete Choice Methods with Simulation / Train

**Websites**

- [https://courses.edx.org/courses/course-v1:EPFLx+DiscreteChoiceX+3T2017/course/](https://courses.edx.org/courses/course-v1:EPFLx+DiscreteChoiceX+3T2017/course/)