# Doctoral School in Finance and Economics

# DSEF 2.1. Discrete Choice Models

## 1. Course details

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|---|---|
| Semester: | 2 |
| Credit rating: | 1 ECTS |
| Teaching units | 15 |
| Pre-requisite(s): | Good knowledge of basic econometrics |
| Lecturers: | Professor Michel Bierlaire (EPFL, Lausanne) |
| Administrator: | Noémie Courtois |
| Tutors: | None |
| Seminar times and rooms: | June 29, 30 and July 1st 2021 – CK C-02 – Timetables below |
| Tutorial times and rooms: | None |
| **Communications** | **It is important that students should regularly read their University e-mails, as important information will normally be communicated this way.** |
| Mode of assessment: | One essay per student / review of a paper with replication of the key results and critical assessment + proposed extensions. |
| Examination Periods: | N/A |
| Course WebPage: | Moodle.uni.lu |

## 2. Aims and objectives

### Aims

The course will provide an overview of advanced discrete choice models, with an emphasis of the modeling aspects.

### Learning Objectives

At the end of this course students will have a broad overview of the recent literature devoted to the economic analysis of international migration. After this course, students will be able to understand the key elements of the debate around immigration and emigration.

On completion of this course unit successful students will be able to:

1. Be familiar with the use of discrete choice models (DCM)
2. Understand the basic use of the Logit model and its properties
3. Understanding the property of IIA in DCMs
4. Be familiar with extensions of the logit, such as the Nested and the Cross-Nested Logit.
5. Understand applications, for instance in the field of transportation.

### Indicative schedule

| Dates 2021 | Room | Time | Content |
|---|---|---|---|
| June 29 | C-02 | 9:00 - 10:30, 10:45-12:15<br>13:15 - 14:45. | Part 1 |
| June 30 | C-02 | 9:00 - 10:30, 10:45-12:15<br>13:15 - 14:45. | Part 2 |
| July 1st | C-02 | 9:00 - 10:30, 10:45-12:15 | Part 3 |

### Course details (by topics)

The following topics will be covered:

- Introduction to choice models and the logit model
- Biogeme: a python package to estimate choice models.
- Forecasting and derivation of indicators
- The nested logit models
- Multivariate extreme value models
- Sampling strategies and impact on estimation and forecasting
- Capturing taste heterogeneity with mixtures of models
- Choice models with latent variables: modeling attitudes and perceptions
- Panel data

**Indicative reading list**


- Train, K.E., 2009, Discrete Choice Methods with Simulation, Cambridge……..

- Ben Akiva, M. and Lerman, S.R., Discrete Choice Analysis, MIT

- Ben-Akiva, M. and Bierlaire, M. (1999). Discrete choice methods and their applications to short-term travel decisions. In Hall, R., editor, Handbook of Transportation Science, pages 5–34. Kluwer.

- Bierlaire, M. (2006). A theoretical analysis of the cross-nested logit model. Annals of Operations research, 144(1):287–300.