

**Micro-Econometric Methods:  
Reduced-form and Structural Approaches**

**Instructor:** Professor Christian Belzil, Ecole Polytechnique and ENSAE, and Visiting Professor Concordia University

**Timetable:** To be announced

**Course Objectives:** The objective of the course is to introduce students to some of the most fundamental micro-econometric techniques used in Labor economics, IO, Behavioral economics and Marketing sciences. The course will emphasize both modeling and applications. At the end of the course, the student should have accumulated a sufficiently large technical background to understand a large share of the micro-econometric policy evaluation literature as well as much of the rapidly growing literature based on estimating dynamic discrete choices. A strong emphasis will be put on structural methods.

The course targets Master's and Ph.D. students. Students should have a background in fundamental econometric theory as well as in Microeconomics and Macroeconomics.

The main topics will be the following:

- **Estimation: The Method of Maximum likelihood and Generalized Method of Moments**
  - Properties, Computational issues, Inference
- **Binary Choice Models**
  - Probit, Logit, Identification
- **Multinomial Discrete Choices**
  - Applications to Industrial Organization and Marketing
- **Sample Selection Models and Treatment effect Models**
- **Dynamic Linear Panel data models**
- **Static and Dynamic Discrete Choice Panel Data Models**
  - Applications to Dynamic Consumer Demand Models in Marketing (Scanner data)
- **Duration data Analysis**
  - Proportional Hazards
  - Models with Unobserved heterogeneity
  - Multi-State Models

- **Estimation of Structural Dynamic Discrete Programming Models**
  - Optimal Stopping Models (Direct Solution Method)
  - Rust’s Dynamic Logit Method (*1987, Econometrica*)
  - Computationally Intensive Solution Methods: The Curse of Dimensionality,
  - Keane and Wolpin’s Interpolation and Simulation Method
  - Identification and Alternative Solution Methods, Hotz and Miller’s theorem, Aguirregabiria and Mira, Arcidiacono-Miller, Expectation Parameterization (Geweke Keane)
- **Decisions under uncertainty (if time available)**
  - Decision Theory
  - Models of Experience Goods (Marketing/IO)
- **Models with general equilibrium** (Heckman, Lochner and Taber, 1998) (if time available)
- **Structural Estimation in Behavioral Economics (if time available)**

- **Lecture Notes:** Lecture notes will be distributed prior to each meeting and will also be posted on the Concordia Web service reserved for teaching. Those not able to do so can get them by mailing me at *christian.belzil@gmail.com*.
- **Course Evaluation**

The course requirements involve doing one computational problem sets which consists of estimating a dynamic programming model of your choice with data of your choice, or a final exam. I can also offer data bases for a project.

Although lecture notes should be relatively “self-contained”, individuals who want to invest more on some of these topics found in the first part of the course can consult:

Microeconometrics: Methods and Applications by C. Cameron and P. Trivedi,  
Cambridge University Press.

Over the period of the course, I shall be available at *christian.belzil@gmail.com*.