- Faculté des sciences économiques
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## Applied Econometrics (5ER2020)

| Filières concernées | Nombre d'heures | Validation | Crédits ECTS |
|---|---|---|---|
| **Master en économie appliquée** | **Cours: 4 ph** | **Voir ci-dessous** | 6 |
| **Master en statistique** | **Cours: 4 ph** | **Voir ci-dessous** | 6 |

ph=période hebdomadaire, pg=période globale, j=jour, dj=demi-jour, h=heure, min=minute

**Période d'enseignement:**

- Semestre Printemps

**Equipe enseignante**

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**Contenu**

This course teaches the modern practice of applied econometrics. A first objective will be to introduce the nomenclature required to discuss causality in applied economic research. We will define notions such as "treatment effect," "control group," and "counterfactual outcome," and delineate conditions under which observational data can provide evidence about cause-to-effect relationships. Second, we will apply regression analysis to quantify the effects of an intervention of interest. We will discuss a number of research designs that can lead to policy-relevant empirical evidence. Doing so, students will acquire the skills to carry out econometric research themselves: assembling a dataset, analyzing it with econometric software, and interpreting the results. Finally, the course will help students work towards their master dissertation, showing how to identify and interpret relevant scientific literature, and how to structure an argument to present empirical results.

The course combines classroom teaching sessions and supervised computer lab exercises. In the classroom, we will review a number of econometric modeling tools, and how these can be used to estimate treatment effects and inform causal relationships. The tools will include basic linear models and its extensions to capture heterogeneous treatment effects, models for qualitative and censored variables, basic panel data (fixed-effects) analysis, difference-in-difference models, regression discontinuity designs, and instrumental variable techniques. If time permits, we will also introduce the basics of structural estimation.

In the computer lab sessions, we will work with both simulated and real-world datasets, and students will be given step-by-step tutorials on how to practice econometrics using Stata. We will also discuss how to report and interpret your work, and design scientific documents with Latex.

Teaching will be interactive and emphasize a hands-on approach to perform empirical research in economics.

**Forme de l'évaluation**

Mixed assessment based on two class assignments (20% each), regular classroom quizzes (10%), and a final 2-hour written exam during the exam session (50%).

Retake: 2-hour written exam during the exam session (100% of the final grade).

Neither documents, calculators, nor connected objects are allowed during the exams. In case of violation of these rules, the students are in

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situation of fraud and the unauthorized items will be removed. The exam could be deemed as failed.

### Documentation

The course will loosely follow sections from three different textbooks, which can be accessed through from Moodle. The first two books cover the main conceptual topics covered in the course: (i) Joshua D. Angrist & Jörn-Steffen Pischke (2009) Mostly Harmless Econometrics: An Empiricist's Companion, Princeton University Press; (ii) Jeffrey Wooldridge (5th ed., 2016) Introductory Econometrics: A Modern Approach, Cengage Learning.

We will also refer to an excellent resource on how to use Stata to carry out empirical research: A. Colin Cameron and Pravin K. Trivedi (2010) Microeconometrics Using Stata: Revised Edition, Stata Press. Finally, we will use a number of well-published articles that will be discussed during class.

Software: We will use Stata and Excel, which will be available in the computer lab, or on personal computers through remote desktop (see https://www.unine.ch/sitel/logiciel). For Latex we will use Texstudio (https://www.texstudio.org) and Jabref (http://www.jabref.org), which are freeware and can be installed on personal computers.

### Pré-requis

Having completed at least one econometrics course at the bachelor level is required. Students with background in other disciplines (incl. other social sciences) are encouraged to make an appointment with the instructor to discuss possible adjustments.

### Forme de l'enseignement

Weekly 2-hour in-class lecture and 2-hour computer lab session. The course will make use of "active learning" methods, i.e. interactive teaching drawing on prior preparation, supervised individual and group work, as well as active class participation by students. Lab sessions will give students the opportunity to apply econometric techniques under supervision by the professor.

### Objectifs d'apprentissage

Au terme de la formation l'étudiant-e doit être capable de :

- Define basic vocabulary used in applied econometric literature
- Assemble datasets with reproducible steps
- Recognise a set of key econometric models and their underlying assumptions
- Express necessary conditions for the identification of causal relationships in a dataset
- Examine data with econometric software
- Write up a research idea that would lead up to a project
- Criticise empirical strategies
- Explain in plain language an empirical strategy
- Defend empirical results in front of an audience
- Interpret empirical results to draw policy conclusions

### Compétences transférables

- Generate new ideas (creativity)
- Design projects
- Communicate in a second language
- Manage a project