

- 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 finance	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 core component of applied economics. 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. We will also discuss the peer-review and publication process in academia, which will be useful for students to understand how to cite the work of others and place their own work as a contribution to existing studies.

The course combines classroom teaching sessions, reading groups, and supervised computer lab exercises. Classroom sessions consist in regular ex-cathedra teaching where the instructors presents how econometric techniques can be applied with data. The techniques include basic linear regression, specifications to capture non-linearities (dummy-coded models, linear splines, polynomials) and heterogeneous treatment effects (interaction terms), models for qualitative and censored variables (linear probability models, logit and multinomial logit models, tobit models), and a range of research design for observational data: control variables and panel fixed effect models, difference-in-difference with leads and lags, synthetic control methods, instrumental variables, and regression discontinuity designs. If time permits, we will also introduce the basics of structural estimation.

For reading groups, each week a scientific article that applies the methods seen in class will be assigned. Students will be provided with a reading guide consisting of questions the help them identify the relevant aspects of the articles, and highlight the way research designs and empirical results are presented. During the reading group sessions, we will then discuss the answers to these questions among small groups and then with feedback from the instructor.

Finally, in the computer lab sessions students will work with simulated data to apply the tools studied in class. In each session, students will receive both a dataset and a set of instructions on how to perform the analysis, which will help them learn how to perform econometric research with the software Stata. During supervised exercises, they will be able to derive their own results, and learn how to report and interpret their

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results. They will also learn how to design scientific documents with Latex, which will provide a stepping stone toward their master dissertation. Throughout, teaching will be interactive and emphasize a hands-on approach to perform empirical research in economics.

Forme de l'évaluation

Mixed assessment based on an individual empirical research project applying one of the research designs seen in class (30%), presence and participation in the reading group sessions (10%), and a final 2-hour written exam during the exam session (60%).

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

Documentation

The course will be mainly based on slides and material designed specifically for the course, and on well-published scientific articles assigned for the reading group sessions and available on Moodle.

However, the following textbooks can be useful as a complement or to do deeper in some specific topics (all available on Moodle): (i) Joshua D. Angrist and Jörn-Steffen Pischke, *Mostly Harmless Econometrics*; (ii) Joshua D. Angrist and Jörn-Steffen Pischke, *Mastering Metrics*; (iii) Jeffrey Wooldridge, *Introductory Econometrics: A Modern Approach*; (iv) A. Colin Cameron and Pravin K. Trivedi, *Microeconometrics Using Stata*.

Software: We will use Stata 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, 2-hour discussion session, 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. For the project, students will have the opportunity to have a personal appointment with the instructor to discuss their research ideas and project.

Objectifs d'apprentissage

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

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

Compétences transférables

- Discuss complex issues
- Design projects
- Generate new ideas (creativity)
- Manage a project