

Economics 621: Econometrics I

Course Outline (Fall 2016)

Instructor: Tom Parker

Lecture Time/Location: Monday and Wednesday, 2:30pm - 3:50pm, PAS 1229

Email: tmparker@uwaterloo.ca

Office: HH 206

Office Hours: Tuesday, 2:00pm - 3:30pm or by appointment

Phone: 519-888-4567 ext. 38600

Course Objective: This course introduces you to the fundamentals of estimation and inference for regression models that are commonly used in economics. After an introduction to the basic linear model and its ordinary least squares estimator, we will discuss the way in which methods can be altered to deal with the challenging features typical in economic data, including heteroskedasticity, serial dependence and endogeneity. This course should prepare you to use more advanced estimation and inference techniques in applied econometrics courses or to continue to a more advanced econometric theory course.

Textbook: The (optional) course text is *Econometric Theory and Methods* by R. Davidson and J.G. MacKinnon, Oxford University Press 2004.

Topics: The exact timing will be determined as we go along, but the material will be sequenced as follows. Chapters of Davidson & MacKinnon that you should read are in parentheses.

1. **Mathematical preliminaries:** (1-2) A quick review of necessary probability theory, algebra and geometry required to work with the ordinary least squares estimator.
2. **Ordinary least squares:** (3-5) Statistical properties of LS estimates, inference methods.
3. **OLS Extensions:** (6-7) Nonlinear regression and generalized least squares.
4. **Instrumental variables:** (8) Estimation with endogenous explanatory variables.
5. **General estimation techniques:** (9-10) Maximum likelihood estimation and the generalized method of moments.
6. **Time series methods:** (11-12) (time permitting) more on dynamic models and their estimation.

There will be approximately one homework assignment per itemized section listed above.

Evaluation: Your mark will be made up of the following parts, with relative weights in parentheses below.

1. Homework (20%)
2. Midterm Exam (40%)
3. Final Exam (40%)

Other administrative details:

Cross-listed course: Please note that a cross-listed course will count in all respective averages no matter under which rubric it has been taken. For example, a PHIL/PSCI cross-list will count in a Philosophy major average, even if the course was taken under the Political Science rubric.

Academic Integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo are expected to promote honesty, trust, fairness, respect and responsibility. See <https://uwaterloo.ca/academic-integrity/> and https://uwaterloo.ca/academic-integrity/sites/ca.academic-integrity/files/uploads/files/FinalFact_0.pdf for more information. You are encouraged to discuss homework and course material with other students in class. However, you are responsible for submitting your own work. If I determine that any assignment was not written solely by the student whose name appears on the work, that student will receive a zero for the grade in question and may receive a failing grade for the class.

Discipline: A student is expected to know what constitutes academic integrity to avoid committing an academic offence, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about “rules” for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate associate dean.

For information on categories of offences and types of penalties, students should refer to Policy 71, Student Discipline (<http://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-71>). For typical penalties check Guidelines for the Assessment of Penalties (<http://uwaterloo.ca/secretariat/policies-procedures-guidelines/guidelines/guidelines-assessment-penalties>).

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4 (<http://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-70>) and the Faculty of Arts’ grievance processes information (<https://uwaterloo.ca/arts/current-undergraduates/student-support/student-grievances-faculty-arts-processes>). When in doubt please be certain to contact the department’s administrative assistant, who will provide further assistance.

Appeals: A decision made or penalty imposed under Policy 70, Student Petitions and Grievances (other than a petition) or Policy 71, Student Discipline may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72, Student Appeals (<http://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-72>).

Note for Students with Disabilities: The AccessAbility Services (AS) Office (<http://uwaterloo.ca/disability-services/>), located in Needles Hall, Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with AS at the beginning of each academic term.