Instructor: Thomas Parker  
Office: HH 213  
Office Hours: Wednesday, 2:30pm-3:30pm or by appointment  
Phone: 519-888-4567 ext. 38600  
Email: tmparker@uwaterloo.ca  
Lecture Time/Location: Monday and Wednesday, 1:00pm - 2:20pm, HH 345

Course Objective: In this course we will apply many tools that are frequently used in the analysis of cross-sectional and longitudinal data used in empirical microeconomics. By the end of the course, you should be familiar with many methods commonly used in applied fields of economics. You should also be familiar with the implementation of these tools using statistical software and you should gain some experience communicating your results to others.

Suggested Textbooks: There are two recommended (but not required) texts:

- Angrist, J. and Pischke, J.-S., *Mostly Harmless Econometrics*, Princeton University Press, 2008. This book will be interesting to you if you would like to see more examples of theory applied to microeconomic (almost exclusively labor) topics, or if you would like to see a different presentation of some of the methods described in Cameron and Trivedi.

Tentative schedule: The exact timing of topics will be determined as we go along; topics that are starred will be covered given time and/or demand.

1. **Tools and principles:** Basics of Latex; basics of R; using Latex and R together (i.e., with Sweave or knitr); some rules for reproducible research

2. **Basic tools:** Review of stochastic limit theory; transformations of estimates; the δ-method and simulation methods; systems of equations, instrumental variables and the generalized method of moments; application to demand analysis

3. **Panel data models:** Between/within estimators; the Hausman-Taylor IV estimator; Hausman tests; clustered standard errors; repeated cross-sectional data; *lagged dependent variables; *limited dependent variables

4. **Quantile regression:** Objective function and estimation; inference using one or more conditional quantiles; nonparametric quantile regression; *extensions to panel data, *IV models, *counterfactual decompositions

5. **Models with limited dependent variables:** binary dependent variable models; censored regression models (Tobit, Heckman two-step, quantile regression); ordered probit model; multinomial logit model; regression models for count data
**Evaluation:** Your mark will be made up of the following parts, with relative weights in parentheses below.

1. Homework (50%)
2. Midterm Exam (25%)
3. Research paper (25%)

At least one homework assignment will be given for each section of the course listed above. The main focus will be on empirical data analysis and computational methods, and later homework may involve in-class presentations of some of your results. The midterm exam will occur fairly late in the semester but there will be no final exam, so you can finish your research paper towards the end of the course.

**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](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)](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-assessment-penalties](http://uwaterloo.ca/secretariat/policies-procedures-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](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](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](http://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-72)).

**Note for Students with Disabilities:** The AccessAbility Services (AS) Office ([http://uwaterloo.ca/disability-services/](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.