Instructor: Dinghai Xu

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Lecture Time: M. & W. 11:30 to 12:50  Lecture Location: DWE 3522A
Office Hours: Fri. 1:30 to 3:00 or by appointment
TA: TBA

Course Description

This course covers several theoretical/applied topics in Econometrics, including regression models, some popular estimation methods and time series analysis. This course will provide a good understanding of the techniques and inference widely used in applied research in economics. The details for each topic of this class are listed below.

The lecture material will be based on a collection of reference books and/or published papers. There is no required textbook.

Useful References:


Journals:

Topics

1. Overview of Important Concepts in Statistics (EA: Appendix A, B)
   Random Variable and Probability
   Distribution Functions
   Moments and Statistical Inference

2. Topics in Regression Models and the Statistical Inference
   (EA: Chpt. 1, 2, 3, 4, 5, 7, 10; ETM: Chpt. 1, 2, 3, 4, 5)
   Linear Regression Models
   Non-Linear Regression Models
   Multivariate Regression Models
   Model Mis-specification Analysis

3. Topics in Estimation Methods and Procedures
   (EA: Chpt. 15, 16; ETM: Chpt. 7, 8, 9, 10)
   Method of Maximum Likelihood Estimation (MLE);
   Method of Moments (MOM)/ GMM;
   Generalized Least Squares (GLS) Procedure
   Instrumental Variable (IV) Estimation (2SLS)
   Monte Carlo Simulation

4. Topics in Time Series (if time permitted)
   (TSA: Chpt. 3, 5, 8, 15, 21)
   Introduction of Stochastic Process
   Statistical Properties of Stationary ARMA
   Autoregressive Conditional Heteroskedasticity (ARCH) /
   Generalized ARCH (GARCH) Models
   Stochastic Volatility Models
   Non-Stationarity in Time Series

Some related papers (empirical / theoretical) for each topic might be discussed in the class. The topics might not be covered in the above order.

Computing Software

There might be several problem sets which require using statistical software for computation. Feel free to use any computing package you prefer. But I would suggest Stata or R or Matlab. Some popular computing software packages have been installed in the computers in the computer Lab or in Arts’ public computing labs. For more information, please consult the Information Systems and Technology (IST) office.
Course Requirements

- Assignments (20%)
- Midterm Exam (30%)
- Final Exam (50%)

Economics Department Deferred Final Exam Policy

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

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 the UWaterloo Academic Integrity Webpage (https://uwaterloo.ca/academic-integrity/) and the Arts Academic Integrity Office Webpage (http://arts.uwaterloo.ca/current-undergraduates/academic-responsibility) for more information.

Discipline: A student is expected to know what constitutes academic integrity, to avoid committing academic offenses, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about “rules” for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. When misconduct has been found to have occurred, including writing exams in a section that you are not registered in, disciplinary penalties will be imposed under Policy 71 – Student Discipline. For information on categories of offenses and types of penalties, students should refer to Policy 71 - Student Discipline. For typical penalties check Guidelines for the Assessment of Penalties found at http://www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm.

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. In addition, read the Student Grievance Process for the Faculty of Arts found at https://uwaterloo.ca/arts/current-undergraduates/student-support/student-grievances-faculty-arts-processes.

Appeals: A student may appeal the finding and/or penalty in a decision made under
Policy 70 - Student Petitions and Grievances (other than regarding a petition) or Policy 71 - Student Discipline if a ground for an appeal can be established. Read Policy 72 - Student Appeals.

**Other sources of information for students**

*Academic integrity (Arts) Academic Integrity Office (uWaterloo)*

**Accommodation for Students with Disabilities**

*Note for students with disabilities:* The AccessAbility Services office, located in Needles Hall Room 1401, 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 the AS office at the beginning of each academic term.