

UNIVERSITY OF WATERLOO  
ECONOMICS 321: INTRODUCTION TO ECONOMETRICS  
FALL 2011

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**Instructor:** Mikal Skuterud  
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Office hours: Wednesdays, 2:30 p.m. – 4:00 p.m.

**Classes:** Wednesdays, 6:00 p.m. – 9:00 p.m.  
HH 1108

**Course description:**

This course provides an introduction to the theory and application of econometrics, with an emphasis on providing students with an intuitive command of the classical multivariate linear regression model. Considerable attention will be given during classes and in assignments to simulations (Monte Carlo studies). Students are expected to have a background knowledge of basic statistics, including sampling distributions and hypothesis testing.

**Primary text:**

Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach* (4th edition), South-Western: Mason, Ohio, 2009.

**Secondary reference texts:**

Kennedy, Peter, *A Guide To Econometrics*, 6th edition, The MIT Press, 2008.

Verbeek, Marno, *A Guide To Modern Econometrics*, 2nd edition, John Wiley & Sons, 2004.

**Evaluation:**

Final grades will be calculated as follows:

Assignments:	25%
Midterm exam:	25%
Final exam:	50%

Three assignments will be given over the term. They will be distributed on September 21, October 12, and November 2. Their due dates are October 5, October 26, and November 16, respectively. *Late assignments will be assigned a grade of zero.* Each assignment will involve using a statistical software package called **Stata**. This software is available in most Arts computing labs (HH 236, PAS 1237, PAS 1098). The software can be ordered from <http://www.stata.com/order/new/edu/gradplans/cgpcampus-order.html> and picked up at the CHIP office (MC1052). To help students deal with programming issues, two complete sets of **Stata** reference manuals have been put on reserve at the Dana Porter Library. Also, the Internet is an invaluable resource for learning to program **Stata** effectively and efficiently.

The midterm and final exam will be based on lecture material. The midterm will be held on November 2 and the final exam will be scheduled by the Registrar's Office. The format of these exams will be discussed in class. Should you be ill and miss the midterm exam and can produce the mandatory University of Waterloo Verification of Illness form, the weight will be added to your final exam.

### Course outline:

- 1. The Nature of Econometrics and Econometric Data:**  
What is econometrics?; the econometric model; sampling distributions; data structures; causality  
(*Wooldridge, Chapter 1*)
- 2. The Simple Linear Regression (SLR) Model:**  
Defining the simple linear regression model; the OLS estimator; units of measurement and functional form; properties of the OLS estimator  
(*Wooldridge: Chapter 2*)
- 3. The Multiple Linear Regression (MLR) Model:**  
Defining the multiple linear regression model; mechanics and interpretation of estimates; unbiasedness; variance of OLS estimator; Gauss-Markov theorem  
(*Wooldridge: Chapter 3*)
- 4. Inference:**  
Sampling distribution of the OLS estimator;  $t$  test; confidence intervals;  $F$  test  
(*Wooldridge: Chapter 4*)
- 5. OLS Asymptotics:**  
Consistency; asymptotic normality; large sample inference; asymptotic efficiency  
(*Wooldridge: Chapter 5*)
- 6. Additional Topics in the MLR Model:**  
Scaling; functional form; goodness-of-fit; prediction; using qualitative/discrete data  
(*Wooldridge: Chapters 6 and 7*)
- 7. Heteroskedasticity:**  
Consequences of heteroskedasticity; robust inference; testing for heteroskedasticity; weighted least squares (WLS)  
(*Wooldridge: Chapter 8*)

### Avoidance of Academic Offenses:

*Academic Integrity:* In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [Check: [www.uwaterloo.ca/academicintegrity/](http://www.uwaterloo.ca/academicintegrity/) for more information.]

*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, [www.adm.uwaterloo.ca/infosec/Policies/policy70.htm](http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm). When in doubt please be certain to contact the department's administrative assistant who will provide further assistance.

*Discipline:* A student is expected to know what constitutes academic integrity [check [www.uwaterloo.ca/academicintegrity/](http://www.uwaterloo.ca/academicintegrity/)] 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, [www.adm.uwaterloo.ca/infosec/Policies/policy71.htm](http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm). For typical penalties check Guidelines for the Assessment of Penalties, [www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm](http://www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm).

*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) [www.adm.uwaterloo.ca/infosec/Policies/policy72.htm](http://www.adm.uwaterloo.ca/infosec/Policies/policy72.htm). Note for Students with Disabilities: The Office for Persons with Disabilities (OPD), 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 the OPD at the beginning of each academic term.

*Turnitin.com:* Plagiarism detection software (Turnitin) will be used to screen assignments in this course. This is being done to verify that use of all material and sources in assignments is documented. In the first week of the term, details will be provided about the arrangements for the use of Turnitin in this course. Note: students must be given a reasonable option if they do not want to have their assignment screened by Turnitin. See: <http://uwaterloo.ca/academicintegrity/Turnitin/index.html> for more information.