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UNIVERSITY OF WATERLOO

ECONOMICS 321: INTRODUCTION TO ECONOMETRICS

FALL 2014

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	Office hours: Mondays, 3:00 p.m. – 5:00 p.m.
Classes:	Tuesdays and Thursdays, 2:30 p.m. – 3:50 p.m.
	AL 211

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* (5th edition), South-Western: Mason, Ohio, 2013.

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:

Three assignments will be given over the term. They will be distributed on September 25, October 16, and November 6. Their due dates are **October 9**, **October 30**, and **November 27**, respectively. Note that you have an additional week to complete the third assignment. *Late assignments will be assigned a grade of zero with no exceptions*. Each assignment will involve using a statistical software package called `Stata`. This software is available in the Arts computing labs. The software can also be ordered from `http://www.stata.com/order/new/edu/gradplans/campus-gradplan/`. 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.

There will be two term tests and a final exam based on lecture material. The term tests will be held during the regular lecture time on **October 2** and **November 6**. The format of the tests,

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will be discussed in class. The final exam will be scheduled by the Registrar's Office.

Final grades will equal the maximum of two formula grades: (i) $0.3\,a + 0.2\,b + 0.2\,c + 0.3\,d$; and (ii) $0.3\,a + 0.2\max(b,c) + 0.5\,d$, where a is the unweighted average of the three assignment grades and b, c and d are the grades on the first test, second test and final exam, respectively. *Should you miss a term test for any reason, a grade of zero will be assigned.* Should you miss the final exam, and can produce a valid medical or death record, a deferred can be written. Details on requesting a deferred exam, can be found here: `https://uwaterloo.ca/economics/current-undergraduates/policies-and-resources/deferred-final-exam-policy`. Note that requests for deferred exams must be received within 48 hours of the scheduled exam time.

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. See the UWaterloo Academic Integrity webpage (`www.uwaterloo.ca/academic-integrity/`) 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. See Policy 70, Student Petitions and Grievances, (`https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-70`). 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 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://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm`). For typical penalties check Guidelines for the Assessment of Penalties (`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 (`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.