University of Waterloo
Department of Economics
Econ 221 – Section 1
Statistics for Economists
Winter 2016
Monday and Wednesday, 11:30-12:50 pm DWE 1501

Instructor Information

Instructor: Ryan George
Office: HH 218
Office Phone: 519-888-4567 ext. 33169 (please do not leave voice mails)
Office Hours: Monday and Wednesday 1:30-2:30 pm
Email: r22georg@uwaterloo.ca

The instructor will only respond to emails that include "Econ 221" in the subject line of the message.

T.A. Information

TBA

Course Description

In this course we ask how we can use a sample of individuals to make well-reasoned claims about an unobserved population. We start by discussing ways of describing a population. We then learn how probability theory can be used to model uncertain events. Next we connect these two discussions and derive probability distributions of estimators of population characteristics. These distributions provide a basis for statistical inference about the population. The course introduces statistical modeling (single population, two population and simple regression) and presents least squares estimation in terms of projections of sample information on model vectors.

Course Goals and Learning Outcomes

Through lectures, reading and practice in solving problems by hand and with the aid of statistical software students will obtain:
- a basic literacy with regard to statistical techniques and data analysis;
- familiarity with the use of probability theory in modeling random events.

Required Text

Paul Newbold, William L. Carlson, and Betty M. Thorne, *Statistics for Business and Economics* 8th edition, (Toronto: Pearson Education Inc., 2013).

One copy of the 8th edition is on reserve in the Dana Porter Library.

Recommended Reading

1. D.J. Saville and G.R. Wood, *Statistical Methods: The Geometric Approach* – "Chapter 2: The Geometric Toolkit" pp.10-38. Available through *Library E-reserves*.

Readings Available on LEARN

- Announcements, lecture summaries, assignments and their solutions, midterm solutions.

- Recommended textbook problems with solutions.

Course Requirements and Assessment

Assessment	Date of Evaluation (if known)	Weighting (max of schemes #1 and #2)	
		Scheme #1	Scheme #2
Assignments (3 @ 5% each)	TBA	15%	15%
Midterm 1	February 1st	20%	20% on higher midterm
Midterm 2	March 9th	20%	
Final Examination	Exam Period (scheduled by Registrar's Office)	45%	65%
Total		100%	100%

Assignments

There will be three assignments over the course of the term. Each will count for 5% of the final grade. The assignments will be posted on LEARN, and due in class. Due dates to be announced. Without a prior arrangement with the instructor, *no late assignments will be accepted*.

Midterm Examination

The midterm exams will be **held in class on February 1st and March 9th.** They will test students' proficiency with the material covered in the lectures, assignments and practice problems.

Final Examination

The final exam is comprehensive. The date will be set by the Registrar's Office.

Course Schedule (Tentative)

Week	Date	Topic	Readings Due
1	Jan 4 Jan 6	1. Describing a Population, Sampling and Statistics 2. Vector Representation of a Sample and Statistics	NCT 1.1-3,5; 2.1,2,4; Saville and Wood "Geometric Toolkit" pp.10-25
2	Jan 11 Jan 13	3. Basic Set Theory 4. Introduction to Probability Theory	NCT 3.1 NCT 3.2-3
3	Jan 18 Jan 20	5. Conditional Probabilities 6. Discrete Random Variables I	NCT 3.3-5 NCT 4.1-3
4	Jan 25 Jan 27	7. Discrete Random Variables II Wrap-up and Review	NCT 4.4,5,7
5	Feb 1 Feb 3	**Midterm 1 (February 1st)** 8. Continuous Random Variables I	NCT 5.1-3,5
6	Feb 8 Feb 10	9. Continuous Random Variables II 10. Sampling Distributions	NCT 5.3,6 Appendix NCT 6.1-4.
7	Feb 15 Feb 17	**Reading Week – no classes**	
8	Feb 22 Feb 24	11. Obtaining and Evaluating Estimators 12. Confidence Interval Estimation	NCT 7.1, Saville and Wood "Geometric Toolkit" pp.26-31 NCT 7.2-5
9	Feb 29 Mar 2	13. Introduction to Hypothesis Testing 14. Useful Hypothesis Tests	NCT 9.1-2, 5 NCT 9.3,4,6; 10.2
10	Mar 7 Mar 9	Wrap-up and Review **Midterm 2 (March 9)**	
11	Mar 14 Mar 16	Useful Hypothesis Tests (concluded) 15. Geometric Approach to Testing	NCT 9.3,4,6; 10.2
12	Mar 21 Mar 23	16. Simple Regression	NCT 11.1-5
13	Mar 28 Mar 30	17. Simple Regression and Graphical Analysis of Data Wrap-up and Final Exam Details	NCT 11.9

Missed Work and Accommodation Regarding Assessment

If a student is unable to take a midterm exam for documented reasons, the student's mark will be based upon one midterm mark. If a second midterm is missed for a documented reason, a make-up midterm must be taken. ***Please note that students who decide to take an exam cannot be given accommodation after the fact due to illness or personal complicating factors that may have affected their performance.*** If you are not well on the day of an exam it is advisable that you not take the exam and obtain valid documentation of the circumstances of this decision.

Electronic Device Policy

To avoid disruptions to the learning environment handheld devices must be turned off during the lecture and laptops must be used strictly for lecture-related purposes.   If a student's use of a laptop becomes a distraction for adjacent students that student will be asked to discontinue its use.

Attendance Policy

Lectures are an important component of the learning process and should be attended regularly.

Economics Department Deferred Final Exam Policy

Deferred Final Exam Policy found at https://uwaterloo.ca/economics/current-undergraduates/policies-and-resources/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.

Discipline: A student is expected to know what constitutes academic integrity, to avoid committing academic offences, 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 professor, academic advisor, or the Undergraduate Associate Dean. When misconduct has been found to have occurred, 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 (https://uwaterloo.ca/secretariat-general-counsel/policies-procedures-guidelines/policy-71)

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 (https://uwaterloo.ca/secretariat-general-counsel/policies-procedures-guidelines/policy-70), Section 4.

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 (https://uwaterloo.ca/secretariat-general-counsel/policies-procedures-guidelines/policy-72).

Other sources of information for students:
Academic Integrity website (Arts)
https://uwaterloo.ca/arts/current-undergraduates/student-support/ethical-behaviour
Academic Integrity Office (UWaterloo)
https://uwaterloo.ca/academic-integrity/

Accommodation for Students with Disabilities

Note for students with disabilities: The AccessAbility Services office (https://uwaterloo.ca/disability-services), located on the first floor of the Needles Hall extension (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.