

University of Waterloo
Department of Economics
Econ 221 – Section 2
Statistics for Economists
Fall 2017

Tuesday and Thursday, 8:30-9:50 am PAS 2083

Instructor Information

Instructor: Ryan George

Office: HH 218

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Office Hours: Monday - Thursday 11 am-12 noon or by appointment

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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 and two population) and presents least squares estimation.

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.

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
Tutorial Participation		10%
Assignments (3 @ 5% each)	TBA	15%
Midterm 1	October 3	20%
Midterm 2	November 2	20%
Final Examination	Exam Period (scheduled by Registrar's Office)	35%
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Total		100%

Tutorial Participation

Students are required to attend 10 tutorial meetings over the course of the term. Exercises will be given and reviewed. Students will be given problems to solve and submit and these will be graded (1 attended tutorial, 2 used correct approach, 3 solved problem out of 3). The best 8 out of 10 tutorial performances will be used to calculate the tutorial participation mark. No tutorial will be held on September 7/8th, October 12/13th (week of Fall break), or November 2/3rd.

Several assignments and tutorial exercises will use the statistical software program *Stata*. *Stata* is available on the computers in the following Arts computing labs: PAS 1237, 1080 and 1098.

If you plan on continuing in economics you may find it worthwhile to buy a small version of it through the course grad plan, and become more proficient with it. Information on purchase is available on *Stata* website at

<https://www.stata.com/order/new/edu/gradplans/student-pricing/>

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 October 3 and November 2** . 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	Sept 7	1. Describing a Population, Sampling and Statistics	NCT 1.1-3,5; 2.1,2,4; No tutorial week 1
2	Sept 12 Sept 14	2. Basic Set Theory 3. Introduction to Probability Theory	NCT 3.1 NCT 3.2-3
3	Sept 19 Sept 21	4. Conditional Probabilities 5. Discrete Random Variables I	NCT 3.3-5 NCT 4.1-3
4	Sept 26 Sept 28	6. Discrete Random Variables II Wrap-up and Review	NCT 4.4,5,7
5	Oct 3 Oct 5	Midterm 1 (Oct 3rd) 7. Continuous Random Variables I	NCT 5.1-3,5
6	Oct 10 Oct 12	NO CLASS – FALL BREAK 8. Continuous Random Variables II	NCT 5.3,6 Appendix No tutorial week 6
7	Oct 17 and 19	9. Sampling Distributions 10. Obtaining and Evaluating Estimators	NCT 6.1-4. NCT 7.1,
8	Oct 24 and 26	11. Confidence Interval Estimation	NCT 7.2-5
9	Oct 31 Nov 2	Wrap-up and Review Midterm 2 (Nov 2)	No tutorial week 9
10	Nov 7 and 9	12. Introduction to Hypothesis Testing	NCT 9.1-2, 5
11	Nov 14 Nov 16	13. Useful Hypothesis Tests 14. Simple Regression – Model, Estimation	NCT 9.3,4,6; NCT 11.1-4
12	Nov 21 Nov 23	15. Simple Regression Hypothesis Tests	NCT 11.1-4
13	Nov 28 Nov 30	16. Simple Regression – Prediction, Graphical Analysis Wrap-up and Final Exam Details	NCT 11.5-6, 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 with the balance of the weight shifted to the final exam. 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 is detailed on the department website in the 'Resources and Policies' section of the Undergraduate program page. The web address is

<https://uwaterloo.ca/economics/undergraduate/resources-and-policies/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](#) and the [Arts Academic Integrity webpage](#) for more information.

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](#). For typical penalties check [Guidelines for the Assessment of 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. 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](#).

Accommodation for Students with Disabilities

Note for students with disabilities: The [AccessAbility Services](#) office, located on the first floor of the Needles Hall extension (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.

Mental Health Support

All of us need a support system. The faculty and staff in Arts encourage students to seek out mental health supports if they are needed.

On Campus

- Counselling Services: counselling.services@uwaterloo.ca / 519-888-4567 xt 32655
- [MATES](#): one-to-one peer support program offered by Federation of Students (FEDS) and Counselling Services
- Health Services Emergency service: located across the creek from Student Life Centre

Off campus, 24/7

- [Good2Talk](#): Free confidential help line for post-secondary students. Phone: 1-866-925-5454
- Grand River Hospital: Emergency care for mental health crisis. Phone: 519-749-433 ext. 6880
- [Here 24/7](#): Mental Health and Crisis Service Team. Phone: 1-844-437-3247

- [OK2BME](#): set of support services for lesbian, gay, bisexual, transgender or questioning teens in Waterloo. Phone: 519-884-0000 extension 213

Full details can be found online at the Faculty of ARTS [website](#)

Download [UWaterloo and regional mental health resources \(PDF\)](#)

Download the [WatSafe app](#) to your phone to quickly access mental health support information

Territorial Acknowledgement

We acknowledge that we are living and working on the traditional territory of the Attawandaron (also known as Neutral), Anishinaabe and Haudenosaunee peoples. The University of Waterloo is situated on the Haldimand Tract, the land promised to the Six Nations that includes six miles on each side of the Grand River.