University of Waterloo
Department of Economics
Econ 221 – Section 1
Statistics for Economists
Winter 2020
Tuesday and Thursday, 8:30-9:50 am AL 208

Instructor Information

Instructor: Ryan George
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Office Hours: Monday - Thursday 2-3 pm, 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.

Territorial Acknowledgement

We acknowledge that we are living and working on the traditional territory of the Attawandaron (also known as Neutral), Anishinaabeg and Haudenosaunee peoples. The University of Waterloo is situated on the Haldimand Tract, the land promised to the Six Nations that includes 10 kilometres on each side of the Grand River.

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 some basic forms of statistical modeling (single population, two population, simple regression).

Course Goals and Learning Outcomes

Through lectures, reading and practice in solving problems by hand and spreadsheet calculations 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).

Copies of the 8th edition are 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 (higher grade from two schemes will be used)	
		Scheme #1	Scheme #2
Assignments (3 @ 5% each)	TBA	15%	15%
Tutorial Participation	weekly	10%	10%
Midterm 1	January 30th	20%	20% on better of MT1 and MT2
Midterm 2	March 5th	20%	
Final Examination	Exam Period	35%	55%
Total		100%	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 January 30th (day of MT 1), February 20th (reading week), or March 5th (day of MT 2).

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 Thursday, January 30th and Thursday, March 5th.** 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 7 Jan 9	1. Describing a Population, Sampling and Statistics 2. Basic Set Theory	NCT 1.1-3,5; 2.1,2,4; NCT 3.1
2	Jan 14 Jan 16	3. Introduction to Probability Theory 4. Conditional Probabilities	NCT 3.2-3 NCT 3.3-5
3	Jan 21 Jan 23	5. Discrete Random Variables I 6. Discrete Random Variables II	NCT 4.1-3 NCT 4.4,5,7
4	Jan 28 Jan 30	*Wrap-up and Review* **Midterm 1 (Jan 30) – no tutorial**	
5	Feb 4 Feb 6	7. Continuous Random Variables I 8. Continuous Random Variables II	NCT 5.1-3,5 NCT 5.3,6 Appendix
6	Feb 11 Feb 13	9. Sampling Distributions 10. Obtaining and Evaluating Estimators	NCT 6.1-4. NCT 7.1,
7	Feb 18 Feb 20	No classes – Reading Week **No tutorial**	
8	Feb 25 Feb 27	11. Confidence Interval Estimation 12. Introduction to Hypothesis Testing	NCT 7.2-5 NCT 9.1-2, 5
9	Mar 3 Mar 5	*Wrap-up and Review* **Midterm 2 (March 5) – no tutorial**	
10	Mar 10 Mar 12	Hypothesis Testing continued 13. Useful Hypothesis Tests	NCT 9.3,4,6;
11	Mar 17 Mar 19	14. Two Population Model and Tests	NCT 10.1-2
12	Mar 24 Mar 26	15. Simple Regression – Estimation and Testing	NCT 11.1-4
13	Mar 31 April 2	16. Simple Regression – Goodness of Fit *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

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. Check the Office of Academic Integrity website for more information.

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. [Check the Office of Academic Integrity for more information.] 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. 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: AccessAbility Services, 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 AccessAbility Services 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 support if they are needed.

On Campus

- Counselling Services: counselling.services@uwaterloo.ca / 519-888-4567 ext. 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 form 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: 519-749-4300 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 on 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