

**University of Waterloo**  
**Department of Economics**  
**Econ 221 – Section 1**  
**Statistics for Economists**  
**Winter 2019**

**Monday, Wednesday and Friday, 8:30-9:20 am RCH 207**

**Instructor Information**

Instructor: Ryan George

Office: HH 218

Office Phone: 519-888-4567 ext. 33169 (please do not leave voice mails)

Office Hours: scheduled,

Monday 10 – 11am,

Tuesday 11am – 12 noon,

Wednesday 10 – 11am,

Thursday 11am – 12 noon

or by appointment.

Email: r22georg@uwaterloo.ca

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 six miles 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* 8<sup>th</sup> edition, (Toronto: Pearson Education Inc., 2013).

One copy of the 8<sup>th</sup> 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 (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	February 6	20%	20% on better of MT1 and MT2
Midterm 2	March 13	20%	
Final Examination	Exam Period	35%	55%
Total		100%	100%

## Tutorial Participation

Students are required to attend 11 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 11 tutorial performances will be used to calculate the tutorial participation mark. No tutorial will be held on February 22<sup>nd</sup> (week of Study Break) or April 5<sup>th</sup> (last day of classes).

**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 Wednesday, February 6<sup>th</sup> and Wednesday, March 13<sup>th</sup>**. 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, 9 and 11	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, 16 and 18	3. Introduction to Probability Theory 4. Conditional Probabilities	NCT 3.2-3 NCT 3.3-5
3	Jan 21, 23 and 25	5. Discrete Random Variables I	NCT 4.1-3
4	Jan 28 and 30, Feb 1	6. Discrete Random Variables II	NCT 4.4,5,7
5	Feb 4 Feb 6 Feb 8	<b>*Wrap-up and Review*</b> <b>Midterm 1 (Feb 6th)</b> 7. Continuous Random Variables I	NCT 5.1-3,5
6	Feb 11, 13 and 15	8. Continuous Random Variables II	NCT 5.3,6 Appendix
7	Feb 18, 20 and 22	No classes, No tutorial – Study Break	
8	Feb 25 and 27, March 1	9. Sampling Distributions 10. Obtaining and Evaluating Estimators	NCT 6.1-4. NCT 7.1,
9	Mar 4, 6 and 8	11. Confidence Interval Estimation	NCT 7.2-5
10	March 11 March 13 and 15	<b>*Wrap-up and Review*</b> <b>Midterm 2 (March 13)</b> 12. Introduction to Hypothesis Testing	NCT 9.1-2, 5
11	March 18, 20 and 22	13. Useful Hypothesis Tests	NCT 9.3,4,6;
12	March 25, 27 and 29	14. Simple Regression – Model, Estimation 15. Simple Regression Hypothesis Tests	NCT 11.1-4
13	April 1, 3  April 5	16. Simple Regression – Prediction, Graphical Analysis <b>*Wrap-up and Final Exam Details*</b> <b>*No tutorial April 5<sup>th</sup> *</b>	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](#) 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. 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 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 support if they are needed.

#### **On Campus**

- Counselling Services: [counselling.services@uwaterloo.ca](mailto: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 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: 519-749-4300 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**