University of Waterloo
Economics 221 – Statistics for Economists
Spring 2020

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Tutorial Leader: TBA
Teaching Assistant: 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. Finally, the course introduces statistical modeling (single population, two population and simple regression).

Course Goals and Learning Outcomes

Through lectures, readings, practice problems by hand, and analysis of data with statistical software, students will obtain:

- A basic literacy with regard to statistical techniques and data analysis using MS Excel

- Familiarity with the use of probability theory in modeling random events.

Text and Software

Statistics for Business and Economics (8th edition) Paul Newbold, William Carson and Betty Thome (Pearson).

Additional Useful Text, especially Chapters 5, 8-12

David Freedman, Robert Pisani and Roger Purves. *Statistics*
4th edition, (W.W. Norton and Company, Inc).

Note: Important additional information re: the readings in the course is discussed on the first day and can be found in the "First Class" slides @ LEARN

Data analysis is an important component of this course. We will be using the statistical software package the 'Data Analysis ToolPak' which is add-on within MS Excel. All information relating to software is part of the Introduction to Econ 221 slides. Please install this at the beginning of the course; note, that you will required this add-on to complete the data assignments and for the final exam.

LEARN

- All lectures, examples, assignments, extra readings, data, and additional required Excel files are available at LEARN. All lectures are audio recorded. There is no live component to this course. A lecture is posted at the beginning of each week. Please see the "First Class" slides @ LEARN for further information.

Course Requirements and Assessment

1. Mini-Assignments (11)   Due each week (see below)   25%
2. Data Assignments (3)   Due Dates @ LEARN   20%
3. Final Exam   Specifics are TBA   55%

KEY NOTES:

- There are 3 data assignments for the course. In addition to these, there will be weekly mini-assignments that are to be submitted at the end of each week. ***Please see the information on assignment policies below*** and also available in the "First Class" slides @ LEARN for further information.

- All grades will be posted on LEARN. Only the Registrar's Office can issue final grades.
- Specific logistics for the final exam is TBA. The final exam is remote.
- Requests for accommodation based on religious holiday must be submitted to the Associate Dean.
- Combination of particular distribution and absolute measures will be used to determine the course grades. The university grading system will be relied on as benchmark.

Schedule

The course is split into three sections: Part 1 motivates the course by examining patterns in data; Part 2 covers Probability, and Part 3 brings the first two sections together and covers Inference. The lecture component of the course is structured as 11 recorded sessions as follows:

Posted Date	Topic
May 11	Introduction
May 18	Part 1: Descriptive Statistics
May 25	Part 1: Standard Normal Model
June 1	Part 1: Correlation and Regression
June 8	Part 2: Rules of Probability
June 15	Part 2: Random Variables
June 22	Part 2: Probability Models
June 29	Part 2: A Sampling Distribution Model
July 6	Part 3: Inference – Confidence Intervals
July 13	Part 3: Inference – Hypothesis Testing I
July 20	Part 3: Inference – Hypothesis Testing II
July 27	Part 3: Inference in Regression

Policies

Assignment Policy

All assignments are submitted at LEARN. Data Assignments submitted after the deadline incur a penalty of 2 points per day. Due dates for assignments are known well in advance. All Data Assignments are graded out of 50. Data Assignments will **not** be accepted once the answer key is posted to LEARN. Mini-Assignments are due by 11:59pm on Saturday each week. Given that students have all week to complete the Mini-Assignments, late Mini-Assignments are not accepted under any circumstances.

Examination Policy

Missing the final exam is a very serious matter which automatically results in a grade of zero for the final exam and possibly a failing grade for the course. *Please carefully read the Economics Department policy on deferred final exams for instructions.* Please see the policy below on deferred exams in the Department of Economics.

Institutional-required statements for undergraduate course outlines approved by Senate Undergraduate Council, April 14, 2009

Economics Department Deferred Final Exam Policy
Deferred Final Exam Policy found at https://uwaterloo.ca/economics/undergraduate/resources-and-policies/deferred-final-exam-policy

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/) https://uwaterloo.ca/academic-integrity/

Accommodation for Students with Disabilities

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