

## General Course Information

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<i>Web</i>	See CourseLink for link to external course home page
<i>Office Location</i>	MCKN 048
<i>Office Hours</i>	After lecture or by appointment
<i>Department/School</i>	Department of Economics and Finance

**Class Schedule:** Section 0303: T/Th 10:00-11:20AM, MINS 300

**Lab Schedule:** Section 0303: F 11:30-12:20AM, ROZH 102

**Pre-requisites:** The prerequisite for this course is a 1000-level university mathematics course. This is required to ensure that you have recent mathematical experience.

## Course Description

This goal of this course is to introduce students to both probability theory and statistics, as they are used in business and economics. If we think about most of the important decisions we make in real life, they almost all involve planning for an uncertain future. Probability theory provides an intuitive and powerful tool for thinking about such decisions and consequently plays an important role in fields such as business, finance, economics, and insurance. It also forms the basis for statistics, which offers a meaningful way to analyse the massive amounts of data available to businesses, governments, and researchers. Statistics is used to inform important decisions in areas as diverse as business marketing, financial asset allocation, pharmaceutical drug testing, monetary policy, and the pricing of insurance premiums, to name just a few examples. This course will prepare students both to conduct and understand the type of statistical analysis that is often critical to successful decision making in business and government.

## Course Learning Outcomes

### Skills:

1. Analytical Problem Solving – Both the textbook and lectures include examples showing how to solve problems in statistics and probability. The required Maple TA assignments, and the optional problems and problems from old exams posted on the course web page provide hands on practice. Both the midterm and final exams include problem solving as a core component.
2. Problem Solving in a Real-World Context - Virtually all the problems that students tackle in this course have direct relevance to real world problems. For example, hypothesis testing has a wide range of applications, such as evaluating manufacturers claim that say the average life of its tyres is 90,000 kilometres or examining the claim that household incomes in two cities are identical. The

textbook, lectures, optional problems and old exam problems all provide practice with problem solving in a Real-World context. Both the midterm and final exam include this as core components.

### Knowledge and Understanding:

3. Mathematical Methodology (calculus, algebra, optimisation, etc.). Both probability and statistics involve extensive use of mathematics. Thus, both the textbook and lectures develop new mathematical concepts and applications. These ideas are reinforced via the optional assignments and questions from old exams and tested on both the midterm and final.
4. Statistical and Econometric Methodology (including basic data analysis, sampling, probability, hypothesis testing, confidence intervals, regression analysis, robustness). Both the lectures and textbook cover basic data analysis, sampling, probability, hypothesis testing, confidence intervals, and regression analysis. These topics are reinforced via the Mobius assignments and optional questions from old exams and tested on both the midterm and final.

### Indicative Content

Please note that some topics discussed in lecture may not be included in the textbook and some topics in the readings may not be discussed in lecture. In order to do well on this course, it is strongly suggested that you both complete the readings and attend the lectures. It could be a costly mistake to assume that you can use the book as a substitute for the lectures or vice-versa. The following schedule is only approximate. Below is a preliminary list of topics covered. These may be updated as the course progresses. We will set our pace according to the comfort level of the class and may cover either more or less than what is listed below.

Approximate Week	Textbook Chapters	Topic
1	1,2,3	Graphical Statistical Techniques
2	4	Numerical Descriptive Techniques
3	5	Data Collection and Sampling
4	6	Probability
5	7	Random Variables and Discrete Probability Distributions
6	8	Continuous Probability Distributions
7	9	Sampling Distributions
8	10	Introduction to Estimation
9	11	Introduction to Hypothesis Testing
10	12	Inference About a Population
11	13	Inference About Comparing Two Populations

12	16	Simple Linear Regression and Correlation
13	17	Multiple Regression (Time Permitting)

## Course Assessment

			Associated Learning Outcomes	Due Date/location
<b>Assessment 1:</b>	30%	Mid-term Exam	Course Learning Outcomes 1,2,3,4	Friday, Nov 3, 2023 7-9pm, In person, laptop required, <b>(out of class)</b> Date, time, and delivery method subject preliminary and subject to approval and change
<b>Assessment 2:</b>	35%	Final Exam	Course Learning Outcomes 1,2,3,4	Friday, Dec 15, 2023 2:30-4:30pm, In person, laptop required, <b>(out of class)</b> , delivery method subject preliminary and subject to approval and change.
<b>Assessment 3:</b>	35% <sup>1</sup>	Möbius practice problems	Course Learning Outcomes 1,2,3,4	Tentative due dates: Sat Sep 23, Sat Oct 14, Mon Oct 30, Sat Nov 18, Sat Nov 25.
<b>Total</b>	<b>100%</b>			

## Teaching and Learning Practices

**Please note both lectures and labs are holding in person.**

### Lectures

Lectures may be based on a combination of both pre-prepared slides, some of which may be provided on the external course web page, and impromptu discussion and blackboard work. The lectures will complement, but not strictly follow, the textbook. There is no substitute for attending lecture. Attendance may be taken for informational purposes but is not a component of the course mark. It is expected that students attend lectures.

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<sup>1</sup> The Möbius assignments are provisional and subject to the allocation of sufficient TA and IT support as assessed at the sole discretion of the instructor. In the unfortunate event that the assignments are cancelled either a second term test will be added or the Möbius assignment mark will be transferred to a combination of the final and midterm exam marks. This is a highly unlikely event. Unless you receive clear e-mail communication from the instructors that the assignments are cancelled, you should continue to work on the assignments.

Some of the material covered in lecture is technical in nature and you should not be discouraged if you have trouble understanding the notation or formulas the first time you see them. You will get more out of the lectures if you review the relevant lecture note slides and/or the textbook sections ahead of lecture. It is also recommended that you review your lecture notes with a paper and pencil in hand and that you try your best to work your way through the examples and formulas. Talking your way through the reasoning and intuition is also important. You should not hesitate to ask questions in class, after class, or during office hours. The instructor and TA(s) are here to help you understand the material.

### **Labs**

The labs will focus on the Möbius Assignments near the due dates and on solutions to textbook, old exam questions or problems similar to Möbius assignment problems on other weeks. Some lecture material may also be covered in labs from time to time. It is expected that students regularly participate during lab and material covered in lab may be included on the midterm and final exams. Lab participation may be counted towards your overall participation mark.

## **Course Resources**

### **Required Textbook:**

Gerald Keller, *Statistics for Management and Economics*, Edition Nine or later, new or used copy. South Western. (ISBN: 9781337093453.)

Either a new or used copy of the textbook may be used but note that versions prior to editions 9 are not supported.

### **Required Software License:**

Möbius licence: available for purchase through digital education. Please see the external web page for instructions on how to purchase it.

### **Other Resources:**

Outlines for some of the lecture materials covered in class will be posted on the external class web page under the heading "handouts". Links and logon information will be provided in Courselink. These lecture/slide outlines are neither complete nor self-explanatory. You will get the most out of them if you read them ahead of time and then follow along during lecture. Similarly, some partial lab materials may be posted on the external course web page under the heading "labs".

Other resources may be provided from time to time on (or as links from) either Courselink or the external course web page.

## **Course Policies**

**Policy on Section Coordination:** In semesters in which more than one section of the course is offered, you should be aware that sections taught by different instructors are not coordinated, may use different textbooks and cover different material. Even when the same instructor teaches two sections of the course, the two sections may not always go at the same pace.

### **Midterm Policies (includes grading policies)**

**Please be sure to carefully review the policy on on-line exams below as it applies to all online exams, including midterm exams, make up exams, and the final exam.**

The midterm exam covers all aspects of the course, including the lectures, labs, assignments, and reading. However, some sections of the textbook will be emphasized more heavily than others. The best way to gauge which topics are emphasized is through regular attendance in lecture and lab. Practicing questions from past exams is also highly recommended. These can be found on the course web page.

The Midterm will be held out-of-class (see course assessment above). It is anticipated that the midterm exam will be held in person using a laptop to answer questions on-line. Respondus LockDown Browser will be employed, but Respondus Monitor will not be employed, in accordance with university policy. A make-up exam will be scheduled for students with a legitimate and well-documented excuse as judged by the course instructors. In order to request permission to sit the make-up exam, please e-mail the instructor stating the reason for the missed exam and attaching appropriate documentation. This should be submitted ahead of the regular midterm exam in cases for which it is possible to do so. Be sure to keep a copy for your records. For students who miss both the midterm and the make up midterm exam for a legitimate reason, the course assessment will be re-weighted so that the final exam mark replaces the midterm mark.

### **Final Exam Policies (includes grading policies)**

Please also note that the final exam is a cumulative exam. It covers the entire semester and all aspects of the course. You are strongly encouraged to practice questions from old final exams posted on the course web page. The final for all sections will be held at the same time (see course assessment above). It is anticipated that the final exam will be held in person using a laptop to answer questions on-line. Respondus LockDown Browser will be employed, but Respondus Monitor will not be employed, in accordance with university policy.

### **Mobius Problems**

We are using the Mobius problems as part of an ongoing trial pilot project. The Mobius assignments are provisional and subject to the allocation of sufficient TA and IT support as assessed at the sole discretion of the instructors. In the highly unlikely event that it is cancelled the marks will be relocated in the manner explained in the footnote to the course assessment. If it is cancelled, you will receive clear e-mail notification of the cancellation directly from your instructor. Otherwise, your participation is mandatory.

The Mobius assignments are subject to a 48-hour automatic grace period. Students may use the grace period on an honour system basis (without obtaining written permission) when they have a legitimate reason for not being able to complete their assignment on time. An assignment handed in during the grace period will be marked late, but the instructor will waive the late fee unless the instructor has good reason to believe that the grace period is being used inappropriately. Note well that the official due date is the one announced by the instructor. The due date shown on Mobius may already incorporate the grace period. At the discretion of the instructor, one lowest or missed Mobius assignment may be dropped or replaced by an optional end-of-year assignment when conditions warrant it. In all but exceptional circumstances, this should allow enough flexibility to accommodate any unforeseen events that could otherwise impact your work. In fairness to most students who are responsible in handing in their work on time, Mobius assignments will not

be accepted after the grace period. Any special academic consideration requested must convincingly document why the grace period does not already provide sufficient accommodation.

The five planned assignments have been tentatively scheduled under above under Course Assessment. However, the exact due dates and number of assignments may be adjusted at the discretion of the instructor. Any changes will be communicated to students in lecture, by e-mail, or on Courselink.

## Grading Policies

Unless you have discussed an extension well ahead of the due date with the instructor, late penalties of 5% of the total grade earned per day (including weekends) will be assigned to any assessment (i.e., deducted from the total mark). Extensions will only be granted on the basis of valid medical or personal reasons and need to be requested via email to the instructor as soon as possible. Late assignments will not be accepted once graded assignments have been returned officially to the class at large, unless circumstances permit, and alternative arrangements have been made. Mobius assignments are officially returned to the class at large at the end of the grace period.

Students who find themselves unable to meet course requirements by the deadlines or the criteria expected because of medical or personal reasons, should review the regulations on academic consideration in the Academic Calendar and discuss their situation with the instructor, program counselor or other academic counselor as appropriate.

<http://www.uoquelp.ca/registrar/calendars/undergraduate/current/c08/c08-grds.shtml>

## Policy on Re-grade Request

Any request to remark term tests or assignments must be addressed to your instructors in writing (PDF of a scanned, signed, hard copy) within four weeks and must include the following (i) your name, contact information (telephone and email), and signature, (ii) a clear description of where and why you feel that you were graded in error, and (iii) the following statement exactly as it appears here "In requesting a re-grade I certify that I have not written on, erased, or in any way changed my copy of the exam/assignment since it was handed back to me. I understand that to do so would constitute a serious academic offense. I also understand that my entire exam/assignment will be re-graded (with particular attention paid to the points that I have brought up) and understand that as a result my score on the exam/assignment could fall as well as rise."

## Policy on Digital Recording

**NO digital or electronic recording of any kind may be made during either lectures or labs without explicit written permission from the course instructors. Moreover, NO digital or electronic recordings of any kind provided by the instructors or teaching assistants may be shared, posted, or distributed by any means.** Any digital contact or electronic recordings remain the property of the instructors and are protected by copyright and privacy law. By accessing these recorded materials, you agree to these terms, and you agree to be responsible for any damages that may result if you breach them.

## University Policies

### Academic Consideration

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor in writing, with your name, id#, and e-mail contact. See the academic calendar for information on regulations and procedures for Academic Consideration:

<http://www.uoquelp.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

## **Academic Misconduct**

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community, faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring.

University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection. Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar:

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

## **Accessibility**

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact Student Accessibility Services as soon as possible.

For more information, contact SAS at 519-824-4120 ext. 56208 or email [sas@uoguelph.ca](mailto:sas@uoguelph.ca) or see the website:

<https://wellness.uoguelph.ca/accessibility/>

## **Course Evaluation Information**

Please refer to the [Blue by Explorance system](#).

## **Recording of Materials**

Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

## **Drop date**

The last date to drop one-semester courses, without academic penalty, is **Friday, December 01, 2023**. For regulations and procedures for Dropping Courses, see the Academic Calendar:

<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/>

## **Equity, Diversity, and Inclusion Statement**

At the Lang School of Business and Economics, we are committed to developing leaders with a social conscience, an environmental sensibility, and a commitment to their communities. A core tenet within this vision is that diversity is a strength with which we can experience greater connection and understanding.

As such, we affirm the importance and shared responsibility of our students, faculty, and staff creating and promoting equity and inclusion within our learning spaces. Creating these kinds of learning cultures is a process, not a destination; it requires ongoing willingness on the part of each person to thoughtfully and critically listen, unlearn, learn, and engage as they are exposed to a multitude of perspectives and lived experiences. We encourage dialogues between students and instructors to address and advance opportunities for fostering greater diversity and inclusion in the learning environment. Openness to conversations with each other enables us to reflect and grow as we learn from one another respectfully and holistically.

As a department that is training the professionals of the future, we expect our learning spaces to abide by all institutional policies and guidelines, in particular those outlined by the Office of Diversity and Human Rights and the [University of Guelph Human Rights Policy](#). Discrimination and harassment, as defined by our policies, will not be tolerated. Individuals should inform the appropriate party as per university policies if they experience any such behaviors.