Course Outline Form: Winter 2020

General Information

Course Title: STAT*2060: Statistics for Business Decisions

Course Description: This course is designed for students interested in the application of statistics in a business setting. Topics covered will include the role of statistics in business decisions, organization of data, frequency distributions, probability, normal and sampling distributions, hypothesis tests, linear regression and an introduction to time series, quality control and operations research.

Prerequisites: (4U mathematics or equivalent) or 0.50 credit in mathematics
Restrictions: STAT*2040, STAT*2080, STAT*2120. Not available to B.Sc. students
Credit Weight: 0.5 credit
Academic Department (or campus): Mathematics & Statistics
Campus: Guelph
Semester Offering: Winter
Class Schedule and Location: M/W/F, 3:30pm – 4:20pm, MACN 105.

Instructor Information

Instructor Name: Dr. Lorna Deeth
Instructor Email: ldeeth@uoguelph.ca
Office location and office hours: MACN 548. Office hours are Monday & Wednesday, 1:00pm – 3:00pm.

GTA Information

Test and assignment regrade requests only can be sent to stat2060@uoguelph.ca . Instructions for submitting a regrade request will be posted on Courselink. Note that questions regarding course content or general course questions will not be answered through this email account.

Course Content

Specific Learning Outcomes:

By the end of this course, students should be able to:
- create and properly interpret numerical and graphical data summaries.
- properly interpret probability and carry out basic probability calculations.
- carry out probability calculations for various discrete and continuous probability distributions, and choose the appropriate probability distribution in different scenarios.
- explain statistical inference concepts and methods, including concepts related to sampling distributions, confidence intervals, and hypothesis tests.
- choose an appropriate statistical inference procedure in a variety of situations, carry out the procedure, and effectively communicate a proper interpretation of the results.
- explain the design of some basic experiments and observational studies, and describe how statistical conclusions differ between experiments and observational studies.
- conduct a linear regression analysis, including statistical inference procedures on the model parameters, and provide a proper interpretation of the results.
- use industry-relevant software to assist in conducting the above-mentioned learning outcomes.

Lecture Content:

Week 1: January 6 – 10	Course overview, Introduction (Chapter 1), Gathering & Types of Data (Chapter 2), Plotting Data (Chapter 3, Sections 3.1 – 3.2)
Week 2: January 13 – 17	Summary Statistics, Boxplots, and Linear Transformations (Chapter 3, Sections 3.3 – 3.5)
Week 3: January 20 – 24	Basics of Probability and Probability Rules (Chapter 4, Sections 4.1 – 4.3), Discrete Probability Distributions (Chapter 5, Sections 5.1 – 5.3) **SELF STUDY**: Sections 4.4, 4.6
Week 4: January 27 – 31	The Binomial and Poisson Distributions (Chapter 5, Sections 5.5, 5.7), Continuous Probability Distributions (Chapter 6, Sections 6.1 – 6.2)
Week 5: February 3 – 7	The Normal Distribution (Chapter 6, Sections 6.4 – 6.5), Sampling Distributions and the Central Limit Theorem (Chapter 7, Sections 7.1 – 7.4)
Week 6: February 10 – 14	Confidence Intervals for the Population Mean (Chapter 8, Sections 8.1 – 8.4)
READING WEEK: February 17 – 21 NO CLASSES SCHEDULED	
Week 7: February 24 – 28	Hypothesis Tests for the Population Mean (Chapter 9, Sections 9.1 – 9.3) **SELF STUDY**: Sections 9.4, 9.5
Week 8: March 2 – 6	Hypothesis Tests for the Population Mean (Chapter 9, Sections 9.6 – 9.7, 9.9 – 9.10), Hypothesis Tests for the Difference Between Two Population Means (Chapter 10, Sections 10.1 – 10.3) **SELF STUDY**: Sections 9.8
Week 9: March 9 – 13	Welch Approximate and Pooled Variance t Procedures (Chapter 10, Sections 10.4 – 10.5), Inference for a Population Proportion (Chapter 11, Sections 11.1 – 11.3)
Week 10: March 16 – 20	Inference for Two Population Proportions (Chapter 11, Sections 11.4 – 11.5), Chi-Square Tests for Independence (Chapter 13, Section 13.3)
Week 11: March 23 – 27	Inference for Simple Linear Regression (Chapter 15, Sections 15.1 – 15.4)
Week 12: March 30 – April 3	Inference for Simple Linear Regression and Correlation (Chapter 15, Sections 15.4 cont'd – 15.7), Introduction to Multiple Linear Regression (Chapter 15, Section 15.12 (if time)) **SELF STUDY**: Sections 15.9, 15.11

*Note: Not all topics in every section will be covered in class. Textbook sections, and corresponding supplemental exercises, that can be excluded are listed in the document *STAT2060 Textbook Notes*, available on Courselink.

The schedule above is approximate, and subject to minor changes. The majority of course content will be covered in lectures. However, there are several shorter topics which students will be responsible for learning on their own. These topics are identified by the "**SELF STUDY**" label.

Course Assignments and Tests:

Course Component	Date	Time	Location	Weight
Assignment 1	Tuesday, January 14	Due by 11:59pm	Online	1% for each assignment, best 10 of 11 assignments are counted **Total: 10%**
Assignment 2	Tuesday, January 21	Due by 11:59pm	Online	
Assignment 3	Tuesday, January 28	Due by 11:59pm	Online	
Assignment 4	Tuesday, February 4	Due by 11:59pm	Online	
Assignment 5	Tuesday, February 11	Due by 11:59pm	Online	
Assignment 6	Tuesday, February 25	Due by 11:59pm	Online	
Assignment 7	Tuesday, March 3	Due by 11:59pm	Online	
Assignment 8	Tuesday, March 10	Due by 11:59pm	Online	
Assignment 9	Tuesday, March 17	Due by 11:59pm	Online	
Assignment 10	Tuesday, March 24	Due by 11:59pm	Online	
Assignment 11	Tuesday, March 31	Due by 11:59pm	Online	
Data Project 1	Friday, January 24	Due by 11:59pm	Online	3.75% for each project **Total: 15%**
Data Project 2	Friday, February 14	Due by 11:59pm	Online	
Data Project 3	Friday, March 13	Due by 11:59pm	Online	
Data Project 4	Thursday, April 2*	Due by 11:59pm	Online	
Term Test 1	Friday, January 31	3:30 – 4:15pm	In class	15% for best test, 10% for remaining two tests **Total: 35%**
Term Test 2	Friday, February 28	3:30 – 4:15pm	In class	
Term Test 3	Friday, March 20	3:30 – 4:15pm	In class	
Final Exam	Tuesday, April 7	8:30 – 10:30am	TBA	**Total: 40%**

*Note change of date!

Course Resources

Required Text:

Introductory Statistics Explained, by J. Balka. This document is available in PDF format on Courselink.

Other Resources:

*Lecture notes***:** A set of incomplete lecture notes will be posted on Courselink. It is expected students will have a copy of these notes available, and will fill them in during lectures. Completed lecture notes will not be posted online.

THE LECTURE NOTES ARE FOR INDEPENDENT USE ONLY, AND ARE NOT TO BE RE-DISTRIBUTED IN ANY FORM WITHOUT MY WRITTEN PERMISSION.

*Unit Exercises***:** There are exercises and solutions available on Courselink for all topics in the course. It will be assumed students are working through these exercises after each lecture, to help consolidate the information discussed in class. Students are strongly encouraged to seek help as soon as possible when problems arise.

Microsoft Excel: This course will make use of Microsoft Excel, available as part of Office 365 package to which all University of Guelph students have access. Information about how to access Microsoft Excel through Office 365 is on the CCS website:

https://www.uoguelph.ca/ccs/office365/training/online-training-resources/getting-started-with-office365#howInstall

IMPORTANT NOTE: Students are expected to use the latest version of Microsoft Excel available through the Office 365 package. All instructions and support for using Microsoft Excel within the course will only be available for the latest version of the software. Students who choose to use an older, unsupported version of Microsoft Excel will be required to find their own resources.

Microsoft Excel Drop-in Help: Drop-in help with Excel will be available during the weeks data projects are due. A schedule of the times and locations of Excel help will be posted on Courselink. Students are expected to use these help times as their primary resource for help with the course software.

Learning Centre: Drop-in help is available in the Statistics Learning Centre (Science Commons, 3rd floor of the library) for students seeking help with course content and/or assignments. Hours of operation are Monday/Wednesday: 9:30am – 3:30pm, Tuesday/Thursday: 10am – 4pm, Friday: 9:30am – 2:30pm. Students are expected to use the Statistics Learning Centre as a primary resource for help with course material.

Calculators: Students are required to obtain (and know how to use!) a good, multi-variable calculator. Calculators will be needed to write the terms tests and final exam. I also recommend that you bring a back-up calculator to all evaluations.

Courselink: Course information and resources will be available on Courselink. Students are encouraged to check the website regularly for updated information and announcements.

Course Policies

Communication Policies: My preferred method of communication is in-person or by email. For email communication, you must use your University of Guelph email account. Use STAT*2060 in your subject line, and include your name and student ID number in all correspondence. Emails that do not include a name and ID number, or from non-uoguelph accounts, will not be answered; otherwise, I will try to respond to emails within 3 business days. Please note that only administrative inquiries will be answered via email; questions regarding assignments, course content, etc. will only be answered during office hours or in lecture.

Grading Policies:

Online Assignments: Assignments are done through an online assessment system, and will open at 5:00pm on the Friday before they are due. Students will have 3 attempts for each assignment, with the highest attempted mark counting as the assignment grade. The best 10 marks of the 11 assignments will be used in the calculation of the final grade; the lowest assignment mark will be discarded. This is to account for various problems (computer issues, poor performance on an assignment, illness, overloaded schedule, etc.), and is the only accommodation that will be made. No late assignments will be accepted and missed assignments will automatically receive a grade of 0.

Data Projects: Details regarding each of the data projects will be posted on Courselink. Projects must be handed in by the posted due date/time. No late projects will be accepted and missed projects will automatically receive a grade of 0. Students who cannot complete a project for a valid reason will, **upon my approval**, have the weight of the missed project added to their final exam.

<p align="center">IT IS IN YOUR BEST INTEREST TO COMPLETE EVERY ASSIGNMENT AND PROJECT</p>

Turnitin: In this course, we will be using Turnitin, integrated with the CourseLink Dropbox tool, to detect possible plagiarism, unauthorized collaboration or copying as part of the ongoing efforts to maintain academic integrity at the University of Guelph.

All submitted data projects will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the Usage Policy posted on the Turnitin.com site.

Data projects that are flagged on Turnitin will be subject to further examination, however this does not automatically mean that academic misconduct has occurred. In the event that a more detailed examination does in fact suggest academic misconduct may have occurred, an official investigation will be launched through the CEPS Dean's Office.

*Term Tests***:** Term tests are scheduled during class time, and therefore no student should have a conflict with a term test. In the event you do have a valid conflict (such as a religious obligation or varsity sport), you must contact me immediately to discuss your situation, and supporting documentation must be provided. Students who miss a test for medical illness **must obtain a medical note for their absence** and contact me within 5 business days of the missed test. In the case of absence due to medical illness, a student's final exam will be reweighted to make up for the missed test.

The final exam (date, time and location) is scheduled by the Registrar's Office. Students who miss the final exam due to a valid, documented reason must contact their program counsellor for advice on University regulations regarding final exams. These procedures are based on University policy, and are not under the control of the course instructor.

The format of the term tests and the final exam will be posted at a later date. Students will be allowed a stand-alone calculator (i.e. must not be part of a cell phone, laptop, etc.), and are permitted to have **one double-sided** letter size (8.5'' X 11'') reference page for each of the three term tests (that is, ONE double-sided 8.5" X 11" reference page **per term test**). Students are allowed **two double-sided** 8.5" X 11" reference pages for the final exam. Reference pages must be handwritten. Any required statistical values will be provided. No other resources are permitted.

In order to uphold the University of Guelph's academic integrity standards, the term tests will be scanned and digitally stored before graded tests are returned to the students. Any work that is submitted for regrading will be compared to the corresponding digital copy.

Regrade and Accommodation Request Policies:

Regrade requests must be submitted within two weeks of an assignment/project/test being returned, after which regrade requests may no longer be submitted, and the assignment/project/test grade is final. Note that in the event that a student submits a test for regrading, I reserve the right to regrade the entire test, not just the question under consideration. Procedures for submitting a regrade request will be posted on Courselink.

Requests for accommodation due to illness, personal circumstances, etc. should be made before the assessment is due. If this is not possible, the request should be made within 5 business days of the due date / test date. Valid documentation (medical note, etc.) must be presented when making an accommodation request.

Course Policy on Group Work:

Students are encouraged to work together to discuss course content, share ideas, and ask/answer questions. However, all online assignments, term tests, and final exam in this course must be completed independently.

The data projects can be completed in groups of no more than 3 people, with explicit instructions regarding this group work posted on Courselink. Note that in the event one (or more) group member is unable to complete a data analysis project (due to illness, personal circumstances, etc.), all remaining group members are expected to complete and submit the data analysis project with the unavailable group member removed.

Any unauthorized collaboration, completing another student's work, or having another student complete your work, will constitute academic misconduct.

University Policies

Email Communication:

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

When You Cannot Meet a Course Requirement:

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

Graduate Calendar - Grounds for Academic Consideration
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions
https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml

Drop Date:
Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml

Graduate Calendar - Registration Changes
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml

Associate Diploma Calendar - Dropping Courses
https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml

Copies of Out-of-class Assignments:

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

Accessibility:

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance and not later than the 40th Class Day.

For Guelph students, information can be found on the SAS website https://www.uoguelph.ca/sas

For Ridgetown students, information can be found on the Ridgetown SAS website https://www.ridgetownc.com/services/accessibilityservices.cfm

Academic Integrity:

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 encourages academic integrity. 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.

Undergraduate Calendar - Academic Misconduct
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08- amisconduct.shtml

Graduate Calendar - Academic Misconduct
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml

Recording of Materials:

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

Resources:

The Academic Calendars are the source of information about the University of Guelph's procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars
https://www.uoguelph.ca/academics/calendars

Mental Health Services:

One out of every five students in Canada experiences some sort of mental health issue at some point in their academic career. If you find yourself facing a mental health crisis, or just need to talk to someone, please consider taking advantage of one of the following resources available to University of Guelph students:

Counseling Services: (x53244) is located at Health Services (J.T. Powell Building) and offers individual and group counselling sessions by appointment or walk-in.

Student Support Network: is located in Raithby House (across from the cannon and offers confidential, peer-based, drop-in support.

Good2Talk: (1-866-925-5454) is a free, 24/7 student hotline that provides professional counselling and referrals for mental health, addictions and well-being.

Here 24/7: (1-844-437-3247) specializes in assessment, referral and appointment booking and is available 24/7 for crisis support.

You are not alone and you will not be judged for asking for help.