

University of Guelph
Department of Mathematics and Statistics
Course Outline: Stat*2050 Winter 2021
Statistics II

Disclaimer:

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings and academic schedules. Any such changes will be announced via CourseLink and/or class email. All University-wide decisions will be posted on the COVID-19 website <https://news.uoguelph.ca/2019-novel-coronavirus-information/>

General Information

Course Title: Stat*2050: Statistics II

Course Description (from the Undergraduate Calendar 2020-2021)

In this course, students will learn how to implement good study design and analyze data from complex studies. This course follows naturally from [STAT*2040](#) and features both previously unseen statistical techniques, as well as studying in greater depth some topics covered in [STAT*2040](#). These topics will include: experiments and observational studies; a review of t-tests and confidence intervals; confounding variables; association and causality; Analysis of Variance (ANOVA); simple and multiple linear regression; binary responses (logistic regression); odds ratios and relative risk; and an introduction to experimental design (including blocked designs and factorial treatment designs). Assignments carried out using modern statistical software will form the basis for mastering the material.

Prerequisite(s): 1 of [STAT*2040](#), [STAT*2060](#), [STAT*2120](#), [STAT*2230](#)

Restriction(s): [STAT*2090](#)

Department(s): Department of Mathematics and Statistics

Campus: University of Guelph

Semester Offering: Winter 2021

Class Schedule and Location: The current COVID-19 pandemic necessitates remote delivery of the course. This course is scheduled for classes on MWF at 8:30AM-9:20AM. I am intending that all (or almost all) Monday classes and some of the Wednesday and Friday classes will have “synchronous” delivery of lecture material via Zoom or some similar platform. Wednesday or Friday classes that are going to be synchronous will be announced on CourseLink the previous day. Every effort will be made to post video recordings of all synchronous lectures on CourseLink. Materials for classes covered asynchronously will be posted ASAP on the day the class is scheduled (this will not necessarily be by 8:30AM).

Instructor Information

Instructor Name: Gary J. Umphrey

Instructor Email: umphrey@uoguelph.ca

Office Location: MacNaughton 551 (in non-pandemic times)

Office Hours: Office hours will be conducted remotely through Zoom, details to be announced.

Course Content

Specific Learning Outcomes:

I try to optimize the educational outcomes for each student in the course. Some of the outcomes I consider desirable are to:

- Improve your ability to understand, implement and interpret core statistical methodologies, especially in the areas of regression analysis and experimental design.
- Improve your capacity to design experiments and conduct other research studies that will require subsequent quantitative analysis.
- Improve your capabilities to critically interpret results in research papers or other reports that include statistical analysis and reasoning.
- Improve your capacity to communicate statistical results to other researchers.

Lecture Content:

Lectures vary a fair bit in style and content, you need to keep on top of the lectures (both synchronous and asynchronous) and other course materials.

Labs:

This course does not have a formal lab, but you will be working with hands-on statistical analyses using R statistical software during at least some of the synchronous classes. Make sure to install the latest version of R or R-Studio on your computer. There will be remote TA support to assist you with difficulties you encounter with R, details to be announced.

Course Assignments:

There will be no standard tests or final exam in this course for the Winter 2021 semester. Evaluation will be based entirely on six assignments. The assignments may have individual or group work components (or both). Assignment questions will be posted on Courselink. At least part of each assignment will be posted at least one week before the assignment is due, but questions can be added to any assignment up to 72 hours before the assignment is due.

Your solutions will be submitted electronically, through one or more platforms such as Crowdmark or Courselink. Details of the submission process will be explained for each assignment.

Your final grade will be determined as follows: the first five assignments will be worth 15% each and the sixth (last) assignment will be worth 25%. Heavier weight is assigned to the last assignment since it will include a final project report.

Assignment due dates are: Assignment #1: Friday January 22
Assignment #2: Friday February 5
Assignment #3: Friday February 26
Assignment #4: Friday March 12
Assignment #5: Friday March 26
Assignment #6: Monday April 12 (last class day)

Final examination date and time:

There will be no final exam in this course this semester. This is not a good semester to take the course if you enjoy writing final exams.

Course Resources

Required Texts:

We will make use of texts made available electronically through the library or elsewhere online; these have no cost to you. Here are two very useful books that are available through the University of Guelph Library:

Regression Analysis by Example, 4th ed., by S. Chatterjee & A. S. Hadi (Wiley, 2006). Good chapters to download include 1–6, 11, and 12.

Design and Analysis of Experiments in the Health Sciences, by G. Van Belle and K. Kerr (Wiley, 2012). Good chapters to download include 1-5.

In addition to the mentioned chapters, you may want to download the pdfs for the front and back materials. Indeed you might want to download the entire book contents.

Another good book for the Experimental Design part of the course is Gary Oehlert's (2000) text, "A First Course in Design and Analysis of Experiments", which Dr. Oehlert has generously made available for free as a pdf download. You can find the link here:

<http://users.stat.umn.edu/~gary/Book.html>

Other Resources:

I will be providing other materials (all accessible electronically) as we move through the course.

Course Policies

Grading Policies

Assignments will be submitted electronically, details to be posted on our course website. Deadlines are strictly enforced, unless I decide otherwise. A penalty of 10% per day can be imposed for late assignments. An assignment cannot be submitted after graded assignments are returned to the class. An unsubmitted assignment without an approved request for academic accommodation will receive a grade of 0. If an assignment cannot be submitted but has an approved request for academic consideration, a substitute assignment (not necessarily of the same format) will be provided.

Course Policy on Group Work:

Some assignments may allow or even require group work on one or more components. Explicit rules for such components can vary, and will be detailed with the assignment guidelines.

Course Policy regarding use of electronic devices and recording of lectures

Recordings are solely for the use of the authorized student and may not be reproduced, or transmitted to others, without the express written consent of the instructor.

Additional Course Information

I am a strong proponent of live lectures as part of the learning experience within a vibrant campus environment, but the COVID-19 pandemic requires that we adapt to current and (rather uncertain) future circumstances. After all, we don't want to waste time as we work on building our personal educational capital! I have taught this course several times in the past, and I am confident that this is a good course to take remotely. It will not be as tightly structured as many online courses are, rather I will be attempting to capture the experience of taking a "live" lecture course as much as possible.

The course is designed so that you can take it wherever you might be living, whether in Canada or any other country. You will need a computer with internet access, but I will be structuring the assignments so that there is some leeway for working around inevitable internet access issues.

University Policies

E-mail Communication

As per university regulations, all students are required to check their <mail.uoguelph.ca> 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. See the undergraduate calendar for information on regulations and procedures for Academic Consideration.

Illness

The University will not normally require verification of illness (doctor's notes) for fall 2020 or winter 2021 semester courses. However, requests for Academic Consideration may still require medical documentation as appropriate.

Drop Date

The regulations and procedures for Dropping Courses are available in the Undergraduate Calendar. This semester (W21) the last drop day is on the last day of classes: **Monday April 12, 2021.**

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.

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

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.

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.

Resources

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