

University of Guelph
College of Engineering and Physical Science
Department of Mathematics and Statistics

STAT*2050 Statistics II

Course Outline
Fall 2021

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“OFFICE” HOURS: I’ll make myself available for at least 30 minutes after each lecture (at an appropriate place outside the lecture room, or weather permitting, nearby outside location). I’ll also take at least two virtual hours each week, times and method TBA. I won’t be meeting with students in my office.

LECTURES: 8:30–9:20 MWF in MacN 105. This is a face-to-face offering of the course. Some online resources will be provided for students who cannot attend in person, but this is first and foremost a face-to-face offering of the course. In the event that there is a change of U of G policy, or I am no longer able to come to campus (e.g. I test positive or become symptomatic), alternative delivery arrangements will be made.

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. This includes on-campus scheduling during the semester, midterms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website and circulated by email.

PREREQUISITES: 1 of STAT*2040, STAT*2060, STAT*2120, STAT*2230

RESTRICTIONS: STAT*2090

CREDIT WEIGHT: 0.5 credits.

CALENDAR DESCRIPTION: 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.

COURSE OBJECTIVES: Upon successful completion of the course, students will be able to:

- choose an appropriate statistical inference procedure in a variety of situations, carry out the procedure, and effectively communicate a proper interpretation of the results.
- design basic experiments and other research studies.
- discuss the advantages and disadvantages of various study designs.
- demonstrate an understanding of the limitations and uncertainties associated with statistical models.
- discuss the assumptions of statistical models, investigate these assumptions using appropriate plots and statistics, and discuss the implications of violations of those assumptions.
- discuss and critique statistical analyses and conclusions in published research papers.
- demonstrate competence in using statistical software to implement statistical procedures.

LEARNING RESOURCES: There is no textbook for the course. I will be supplying notes (and *some* supporting videos) as the semester progresses. I may occasionally point to other online resources. If you’re looking for additional reading from a text that is in the spirit of the course, you could try:

- *The Statistical Sleuth*, 3rd ed., by Ramsey and Schaefer (Brooks/Cole, 2013).
- *Regression Analysis by Example*, 4th ed., by Chatterjee and Hadi (Wiley, 2006). (Freely available electronically through the U of G library website.)
- For a refresher on topics in introductory statistics: *Introductory Statistics Explained*, by Balka (2015). (Freely available electronically through our Courselink site.)

GRADING SCHEME:

- Assignments: 36%. There will be 3 equally-weighted assignments, with deadline dates:
 - Friday September 24.
 - Friday October 22.
 - Friday November 19.

Assignments can be completed and submitted either individually or as a group of 2. Assignments must be submitted via Crowdmark.

- Two online term tests: 17% each. Held on Wednesday October 6 and Friday November 5. These will be one-hour tests, held via the quiz tool on Courselink, and they must be completed at some point between 11:59 am and 11:59 pm that day. Full details will follow closer to the date. These tests will be open book, open internet, etc., but they must be completed *individually*, without help from others.
- Final exam (take home): 30%. Released: Monday December 6 at 11:59 am. Submission Deadline: Thursday December 9 at 11:59 pm. (Submitted via Crowdmark.) Like the term tests, the final exam must be completed individually.

ASSIGNMENT AND EXAM POLICIES:

- **Any assignment not submitted by the deadline will not be marked and will receive a grade of 0.**
- You may submit each assignment individually or as a group of 2. While you are encouraged discuss approaches to assignment questions with others, your submitted assignment must be your own work. Copying any part of another student's work is considered academic misconduct. (Please read the section on academic misconduct at the end of this document and in the graduate calendar.)
- The term tests and final exam are to be completed individually.
- If you miss a term test for a valid reason (that you let me know of as soon as possible), your final exam will be reweighted to make up for the missed term test.

STATISTICAL SOFTWARE: We will use R for our statistical analyses in this course. R is available in the computer pools on campus, and can be downloaded (for free) from <https://www.r-project.org/>.

COURSE WEBSITE: <http://courselink.uoguelph.ca>. Notes, announcements, assignments, etc. will be posted here.

OPTIONS FOR GETTING HELP IN THE COURSE:

- Talk to me after class or during my virtual office hours.
- Post on the discussion board on Courselink.
- Use the (virtual) Statistics Learning Centre, available as a Resource page on Courselink. STAT*2050 students are automatically enrolled in the Statistics Learning Centre. Students can interact with a TA via discussion boards, instant message chat rooms, virtual white boards, or live meetings that allow for voice calls. The hours of operation are:

- Monday and Wednesday: 9:30am - 3:30pm
 - Tuesday and Thursday: 10am - 4pm
 - Friday: 9:30am - 2:30pm
- Attend the R drop-in help, which is a Courselink resource page staffed Monday through Friday from 10:00 am until noon. It is staffed by graduate student TAs who can help you with any questions you have about R.

University Policies

Email Communication

As per university regulations, all students are required to check their uoguelph.ca email account regularly: email 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 academic calendar for information on regulations and procedures for Academic Consideration:

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

Illness

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g.. final exam or major assignment).

Safety Protocols

For information on current safety protocols, follow these links:

<https://news.uoguelph.ca/return-to-campus/how-u-of-g-is-preparing-for-your-safe-return/>
<https://news.uoguelph.ca/return-to-campus/spaces/#ClassroomSpaces>

Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives.

Drop date

Courses that are one semester long must be dropped by the end of the last day of classes; two-semester courses must be dropped by the last day of classes in the second semester. The regulations and procedures for Dropping Courses are available in the Undergraduate Calendar: <https://www.uoguelph.ca/registrar/calendars/undergraduate/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. More information: <https://www.uoguelph.ca/sas>

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:

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

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: <http://www.uoguelph.ca/registrar/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:

Counselling Services: Visit the Counselling Services website (<https://wellness.uoguelph.ca/counselling>) to get information on resources available to you, both online and in-person. You can also visit them at Health Services (J.T. Powell Building, ext 53244) where they offer individual and group counselling sessions by appointment or walk-in.

Student Support Network: is located in the Wellness & Education Promotion Centre in the J.T. Powell Building 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.