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University of Guelph  
Department of Mathematics and Statistics  
Statistics II - STAT\*2050  
Course Outline  
Fall 2024 (September 5 - December 13)

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## 1. Course General Information

**Course Title:** STAT\*2050: Statistics II.

**Course 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.

**Prerequisites:** 1 of STAT\*2040, STAT\*2060, STAT\*2120, STAT\*2230 - Must be completed prior to taking this course.

**Restrictions:** STAT\*2090

**Credit Weight:** 0.5 credit

## 2. Course Resources

- **Text:** No textbook is required.
- **Other Resources:** Lecture Notes will be posted on Courselink. The lecture slides are for independent use only and are not to be re-distributed in any form without my written permission. I will be providing other materials as we move through the course.
- **Statistics Learning Centre (SLC):** Located in the Science Commons on the 3rd Floor of the McLaughlin Library, the Statistics Learning Centre is a drop-in extra-help centre staffed by Teaching Assistants who are there to help you with any questions you may have. No appointment is necessary. The hours of operation for the SLC are:

- Monday & Wednesday: 9:30am - 3:30pm
- Tuesday & Thursday: 10am - 4:00pm
- Friday: 9:30am - 2:30pm

For more information, please visit the SLC website

- **Courselink:** Course information and resources will be available on Courselink. Students are encouraged to check this website on a regular basis for updated information and announcements.

### 3. Course Outcomes and Content

#### 1. Course Learning Outcomes

By the end of this course, students should be able to:

- choose an appropriate statistical inference procedure in a variety of situations, carry out the procedure, and interpret the results.
- 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.
- design basic experiments and other research studies.
- demonstrate competence in using statistical software to implement statistical procedures.

#### 2. Lecture Content

The lectures will cover the following topics: Statistical Inference Procedures; Analysis of Variance; Simple and Multiple Linear Regression; Logistic Regression; Introductory Concepts in Experimental Design.

#### 3. Assignments & Tests - Important Dates

The final grade will be calculated as follows:

<b>Assignment 1:</b> Due on Friday, October 4, at 11:59 pm	6%
<b>Assignment 2:</b> Due on Friday, November 1, at 11:59 pm	7%
<b>Assignment 3:</b> Due on Friday, November 29, at 11:59 pm	7%
<b>Midterm 1 &amp; 2:</b> (Wednesday, October 9 and Friday, November 8; respectively)	45%
<b>Final Exam:</b> Saturday, December 7, 8:30 am - 10:30 am	35%

- The weight of both midterm tests will be split as follows. **Your best midterm will weigh 30% and your worst 15%.** The final exam will be **cumulative**. It will cover all the chapters covered in class.

- **A mock exam will be posted on Courselink prior to the midterm and final exam evaluations** so that the students can have the opportunity to practice in a stress-free environment. This will be done a week before the test.
- **Midterms 1 & 2 will be held in class during regular lecture hours.** The final exam room will be announced on Courselink. The final exam will be an in-person evaluation.

#### 4. Course Policies

- **As the class is scheduled to be in-person, the expectation is that students will be attending the live lectures to obtain notes, listen to course announcements, and ask relevant questions.**
- **This syllabus is tentative and may be subject to minor changes.** Any change will be communicated to students.

##### Communication Policies:

- **Emails must be sent from your University of Guelph email account, and include STAT\*2050 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.**
- I will try to respond to emails within 3 business days (8:30 am - 4:30 pm). Please note that I do not answer emails during weekends.

##### Term Test Policies:

- Assignments must be submitted via Dropbox. **Late submissions will not be accepted.**
- Term tests are scheduled during class time, and therefore no student should have a conflict with a test. If a conflict does exist, it is your responsibility to resolve it.
- Students who miss a test for medical illness must contact me within 3 business days of the missed test. In the case of absence due to medical illness, you may be required to complete an alternative assessment in a format of my discretion. If you cannot write a test for mental health reasons or are seeking accommodation on compassionate grounds, you must speak with your Program Counsellor (and include them in all communication with me) before any accommodations will be considered.
- 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 are permitted to use a formula sheet during a test.
- Students are NOT permitted to post test questions to discussion boards (including the course discussion board, the SLC discussion boards, or chat groups on Facebook, Google, etc.), nor are students allowed to post test questions to websites such as Chegg in an attempt to solicit answers. These websites will be monitored for such activities, and students who violate these permissions may face an academic integrity investigation.

#### **Regrade and Accommodation Request Policies:**

- Regrade requests must be submitted within 3 days of a test being returned, after which regrade requests may no longer be submitted, and the test grade is considered final. Note that in the event that a student submits a test or assignment for regrading, I reserve the right to regrade the entire test/assignment, 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 3 business days of the due date / test date. Accommodation will be provided at my discretion and should not be assumed. In the event that an accommodation is not granted, students will be expected to complete the test.

#### **Course Policy on Group Work:**

- Students are encouraged to work together to discuss course content, share ideas, and ask/answer questions. However, all term tests and the final exam are to be completed independently, and without collaboration with other individuals, regardless of whether they are registered in the course.
- Any unauthorized collaboration, completing another student's work, or having another student complete your work, will constitute academic misconduct.

## **5. University of Guelph Policies**

### **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 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 outlined in the Undergraduate Calendar.

**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 make a booking at least 10 business days in advance, and no later than the first business day in November, March or July as appropriate for the semester. Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time.

For students at the Guelph campus, information can be found on the SAS website.

**Accommodation of Religious Obligations:**

If you are unable to meet an in-course requirement due to religious obligations, please email the course instructor within two weeks of the start of the semester to make alternate arrangements.

See the Academic calendar for information on regulations and procedures for Academic Accommodation of Religious Obligations.

**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.

**Drop Date:**

Students will have until the last day of classes to drop courses without aca-

demic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all undergraduate students 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 the Undergraduate Calendar - Dropping Courses.

**Email Communication:**

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

**Health and Wellbeing:**

The University of Guelph provides a wide range of health and wellbeing services at the Vaccarino Centre for Student Wellness. If you are concerned about your mental health and not sure where to start, connect with a Student Wellness Navigator who can help develop a plan to manage and support your mental health or check out our mental wellbeing resources. The Student Wellness team are here to help and welcome the opportunity to connect with you.

**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).

**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 which apply to undergraduate, graduate and diploma programs.

**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 des-

ignated 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 information on regulations and procedures for Academic Consideration.