
University of Guelph
Course Outline
STAT*2120 - Probability and Statistics for Engineers
Winter 2024
(January 8 - April 23)

0. Instructor Information

Instructor Name: Dr. Clémonell Bilayi-Biakana

Instructor Email: cbilayib@uoguelph.ca

Office Location: MACN 541

Office Hours: Thursday 3:00 pm - 4:30 pm in my office.

1. Course Description

Course Title: STAT*2120: Probability and Statistics for Engineers.

Course Description: The topics covered in this course include: Sample spaces; probability, conditional probability and independence; Bayes' theorem; probability distributions; probability densities; algebra of expected values; descriptive statistics; inferences concerning means, variances, and proportions; curve fitting, the method of least squares and correlation. An introduction to quality control and reliability is provided. This course is recommended for students in the B.Sc.(Eng.) program.

Prerequisites: 1 of IPS*1510, MATH*1210, MATH*2080

Restrictions: STAT*2040, STAT*2060, STAT*2080, STAT*2100

Credit Weight: 0.5 credit

Academic Department: Mathematics & Statistics

Campus: Guelph

Semester Offering: Winter

Section 1 Schedule: M/W/F 3:30 pm - 4:20 pm, Room MACN 105.

2. Course Resources

- **Textbook:** Applied Statistics and Probability for Engineers, 7th Edition, by Douglas C. Montgomery, George C. Runger. This document is available on WileyPLUS.

- **Other Resources:** Lecture Notes posted on Courselink. The lecture slides are for personal use only and are not to be re-distributed in any form without my written permission.
- **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

- **R Help Lab:** The R drop-in help will run every weekday, 9:30 am to 11:30 am, in SSC 1305.
- **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.
- **Suggested Exercises:** There will be some indicated exercises on Courselink to help consolidate the information discussed in class. It will be assumed students are working through indicated 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.

3. Course Content

1. Specific Learning Outcomes

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

- carry out and interpret basic probability calculations.
- carry out probability calculations for various discrete and continuous probability distributions, and choose the appropriate probability distribution in different scenarios.
- create and interpret numerical and graphical data summaries.
- 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.

- conduct a linear regression analysis, including statistical inference procedures on the model parameters, and provide a proper interpretation of the results.
- use R to assist in conducting the above mentioned learning outcomes.

2. Lecture Content

The lecture content will cover the following topics:

Part 1: Probability

- Basic Probability Concepts
- Random Variables
- Common Probability Distributions
- Joint and Conditional Random Variables

Part 2: Statistics

- Data Description
- Point and Interval Estimation
- Hypothesis Tests
- Simple Linear Regression

3. Assignments & Tests - Important Dates

The final grade will be calculated as follows:

Assignment 1: Due on Friday, February 2, at 11:59 pm	6%
Assignment 2: Due on Friday, March 8, at 11:59 pm	7%
Assignment 3: Due on Friday, April 5, at 11:59 pm	7%
Midterm 1 & 2: (Monday, February 12 and Monday, March 18; respectively)	45%
Final Exam: Tuesday, April 23, 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%.**
- 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 the regular lecture hours.** The final exam room will be announced on Courselink. The final exam will be an in-person evaluation.
- **Winter Break:** February 19 - 25. Classes will resume on the 26th.
- **There will be a class on Monday April 8 to replace the missed class due to the holiday on Friday March 29. April 8 will run on a Friday schedule.**

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*2120 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 Tests 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 Policies

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.

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 information on regulations and procedures for Academic Consideration

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.

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 make a booking at least 14 days in advance, and no later than November 1 (fall), March 1 (winter) or July 1 (summer). Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time.

More information can be found on the SAS website

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 outlined 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 in-

structor, 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.

Disclaimer: Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via Courselink and/or class email.

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

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).

COVID-19 Safety Protocols:

For information on current safety protocols, follow these two links: link 1 and link 2. Please note, that these guidelines may be updated as required in response to evolving University, Public Health or government directives.