University of Guelph
Department of Mathematics and Statistics
Course Outline: Stat*2120 Winter 2022
Probability and Statistics for Engineers

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 (https://news.uoguelph.ca/2019-novel-coronavirus-information/) and circulated by email.

General Information

Course Title: Stat*2120: Probability and Statistics for Engineers

Course Description (from the Undergraduate Calendar 2021-2022)

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.

Prerequisite(s): 1 of IPS*1510, MATH*1210, MATH*2080

Restriction(s): STAT*2040, STAT*2060, STAT*2080, STAT*2230

Department(s): Department of Mathematics and Statistics

Semester Offering: Winter 2022

Class Schedule and Location: The current COVID-19 pandemic necessitates that lectures for the first two weeks of the semester will be delivered remotely via Zoom. Thereafter it is intended that most lectures will be delivered on-campus, with some remote lectures mixed in; but this is dependent on guidance from the University administration. This course is scheduled for classes on MWF at 10:30AM-11:20AM, with THRN 1200 being the on-campus location. Most remote lectures will be delivered synchronously at the regular class times. Every effort will be made to post video recordings of all synchronous remote 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 10:30AM). On-campus lectures and remote office hours will not be recorded.

Any changes to the mode of lecture delivery will be announced via email, as well as posted on Courselink. Students are expected to check these sources daily for any such information. An announcement of a switch from an on-campus lecture to a remote lecture could potentially occur as late as the day of the lecture, as instructors (like students and everyone else going to the campus) are required to pass the COVID-19 screening protocols on the day of going to campus.

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:

- Strengthen your problem-solving skills, particularly for problems that are quantitative or quantitative-verbal in nature.
- Build your understanding of basic statistical language.
- Learn core statistical methodologies that are employed in almost every field that requires quantitative data analysis, but with particular emphasis on engineering applications.

- Gain a basic understanding of the logic of statistical inference, including its roots in elementary probability.
- Improve your capabilities to critically interpret results in research papers or other reports that include statistical analysis and reasoning.
- Develop key skills for communicating statistical results to others.

Lecture Content:

Lectures vary a fair bit in style and content, you need to keep on top of the lectures 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 classes. You will install the latest version of R or R-Studio on your computer (details to come in class). There will be TA support to assist you with difficulties you encounter with R, as well as with other components of the course. The support this semester is provided virtually through the "Resource" page of your CourseLink account.

Course Assignments and Midterm Test:

This course will have both graded and ungraded assignments, and the assignments may have individual or group work components (or both). There will be four graded assignments. Some assignment questions will be posted on Courselink and some will be available through the text's WileyPlus platform. Assignments may be released in parts. 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, either through WileyPlus or through one or more platforms such as Crowdmark or CourseLink. Details of the submission process will be explained for each assignment.

A midterm test is planned for Friday March 4; this date is tentative and is subject to change. I hope we can get rooms in the evening, as this allows more time and space than if the test is held in class, but an in-class test may be necessary.

Your final grade will be determined as follows:

- the four graded assignments will be worth 12.5% each, for a total of 50%;
- the midterm test will be worth 20%;
- the final exam will be worth 30%.

Graded Assignment due dates are:

- Assignment #1: Thursday January 27
- Assignment #2: Tuesday February 15
- Assignment #3: Thursday March 17
- Assignment #4: Tuesday April 5

Final examination date and time:

An on-campus final exam has been scheduled on Monday, April 18 at 7:00PM−9:00PM.

Course Resources

Required Text:

Applied Statistics and Probability for Engineers & Scientists, Seventh Edition, by D.C. Montgomery and G. C. Runger (2018, published by Wiley).

This text is available in loose-leaf and digital versions; both versions include access to WileyPLUS, which is necessary for completing (in part) the graded assignments. The loose-leaf version includes access to the e-book for the current semester. The digital-only version that is available through the University Bookstore includes a permanent e-book version of the text.

We will cover material in all chapters except 12 and 14. In some chapters we will cover the entire chapter, but in other chapters we will cover a subset of the text material. Further details will be provided in class.

Other Resources:

I will be providing other materials (all accessible electronically) as we move through the course. I rarely provide prepared notes, as I consider learning how to make your own notes an important educational objective.

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, shifting the weight to the final exam will be the usual form of grade reweighting.

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. The course will start with two weeks of remote classes. Thereafter, current planning is that this course will return to on-campus lectures, with some remote lectures mixed in. What happens after the first two weeks depends on instructions and guidance from the University of Guelph administration.

The course is not designed as a distance education course; you must be able to attend all on-campus components. To what extent we will be able to have on-campus components remains to be seen.

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 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: 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 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 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.

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 (https://news.uoguelph.ca/2019-novel-coronavirus-information/) 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 links:

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

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