

University of Guelph
Department of Mathematics and Statistics

STAT*2040 Statistics I
Course Outline for Fall 2022

General Information

Course Description: This course focuses on the practical methods of Statistics and the topics include: descriptive statistics; univariate models such as binomial, Poisson, uniform and normal; the central limit theorem; expected value; the t, F and chi-square models; point and interval estimation; hypothesis testing methods up to two-sample data; simple regression and correlation; introduction to analysis of variance. Assignments will deal with real data from the natural sciences and involve the use of statistical software for computing and visualization.

Prerequisites: 1 of 4U Calculus and Vectors, Advanced Functions and Calculus, OAC Calculus, MATH*1080

Restrictions: STAT*2060, STAT*2080, STAT*2120, STAT*2230

Credit Weight: 0.5 credits

Academic Department (or campus): Mathematics & Statistics

Class Schedule and Location: M/W/F, 8:30am – 9:20am in War Memorial Hall 103

Method of Delivery: Face-to-Face

Instructor Information

Instructor Name: Chong Gan

Instructor Email: ganc@uoguelph.ca

Office Hours: W/F, 2:00pm – 3:30pm, MACN 556.

Online Office Hours: Monday, 2:00pm – 3:30pm via ZOOM. (Details will be posted on Courselink.)

Course Content

Specific Learning Outcomes:

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

- create and properly interpret numerical and graphical data summaries.
- properly interpret probability and carry out basic probability calculations.
- carry out probability calculations for various discrete and continuous probability distributions, and choose the appropriate probability distribution in different scenarios.
- 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.
- explain the design of some basic experiments and observational studies, and describe how statistical conclusions differ between experiments and observational studies.
- carry out the calculations for statistical inference procedures using appropriate statistical software.

Course Text:

Introductory Statistics Explained, by J. Balka. This document is available in PDF format on Courselink.

Tentative Lecture Content:

Week 1: September 9 – 16	Course overview, Chapter 1, Chapter 2
Week 2: September 19 – 23	Chapter 3, Chapter 4 (read section 4.7 on own)
Week 3: September 26 – 30	Chapter 4 cont'd, Chapter 5 (exclude sections 5.9, 5.10)
Week 4: October 3 – 7	Chapter 5 cont'd, Chapter 6 (read section 6.6 on own)
Week 5: October 10 – 14*	Chapter 6 cont'd
Week 6: October 17 – 21	Chapter 7, Chapter 8
Week 7: October 24 – 28	Chapter 8 cont'd, Chapter 9 (read sections 9.7, 9.8 on own)
Week 8: October 31 – November 4	Chapter 9 cont'd, Chapter 10 (read section 10.6 on own)
Week 9: November 7 – 11	Chapter 10 cont'd, Chapter 11
Week 10: November 14 – 18	Chapter 11 cont'd, Chapter 14
Week 11: November 21 – 25	Chapter 14 cont'd, Chapter 15 (read sections 15.8 – 15.11 on own)
Week 12: November 28 – December 2	Chapter 15 cont'd
Independent study: Required between Weeks 8 and 10	Chapter 13

*Note: No lecture on Monday, October 10 due to holiday

The schedule above is approximate, and subject to minor changes. The majority of course content will be covered in lectures. However, students are responsible for reading all of the content/sections listed.

Independent Study: Chapter 13 will not be covered in lecture, and students are responsible for learning this material on their own. Resources such as my office hours, the Stats Learning Centre, and Supported Learning Groups are available to help students with this material. It is recommended that students do not attempt to learn this material before covering the basic concepts of hypothesis testing (Week 8), however it must be completed before Week 10.

IMPORTANT: As the class is scheduled to be a in-person lecture, the expectation is that students will be attending the lectures on campus. No lectures will be recorded. If you miss a class for any reason, you need to negotiate with a classmate to get the notes you missed.

Grading Scheme:

- 6% Online quizzes. There will be 3 quizzes, and each of them will be worth 2% of your final grade. Quizzes will be completed using the Quizzes tool in Courselink. Each quiz will open at 11:59pm ET on a Wednesday and close at 11:59pm ET on a Sunday. You will be able to have 2 attempts in each quiz and the highest attempt will be counted. Each attempt has no time limit.

Course Component	Time
Quiz #1	Wednesday, September 21(11:59pm ET) – Sunday, September 25 (11:59pm ET)
Quiz #2	Wednesday, October 19(11:59pm ET) – Sunday, October 23 (11:59pm ET)
Quiz #3	Wednesday, November 2(11:59pm ET) – Sunday, November 6 (11:59pm ET)

- 24% Data analysis assignments. There will be 2 assignments that require the use of R software, and each of them will be worth 12% of your final grade. The assignments will be submitted electronically in pdf format. You may complete the data analysis assignments on your own, or in groups of 2 or 3.

Course Component	Due Date	Time
Data Analysis Assignment #1	Thursday, October 6	Due by 11:59pm
Data Analysis Assignment #2	Thursday, November 24	Due by 11:59pm

- 35% Term tests. There will be 2 online term tests. Your best test will count for 20% of your final grade, your worst for 15%. They will be carried out via the quizzing tool in Courselink. Each term test will be beginning from 6:30 pm to 7:30 pm Eastern Time (ET) on a Friday. You can enter the exam at any point during this window of time, but will only have 1 hour to complete it from when you start.

Course Component	Date
Term Test #1	Friday, October 14 (1 hour)
Term Test #2	Friday, November 18 (1 hour)

- 35% Final exam. You will write an in-person final exam.
Time: December 16, 11:30am-1:30pm
Location: TBA.

Course Resources

Required Text:

Introductory Statistics Explained, by J. Balka. This document is available in PDF format on Courselink.

Other Resources:

Lecture notes: A set of incomplete lecture notes will be posted on Courselink. It is expected students will have a copy of these notes available, and will fill them in during lectures. Completed lecture notes will not be posted online.

Exercises: There are exercises and solutions available on Courselink for all topics in the course. These are not graded, but the students are expected to work through these exercises after each lecture, to help consolidate the information discussed in class.

Learning Centre: Drop-in help is available in the Statistics Learning Centre (Science Commons, 3rd floor of the library) for students seeking help with course content and/or assignments in introductory mathematics or statistics.

R Statistical Software: Students will be using the statistical software program R/RStudio for their course project. R/RStudio is available on the computers in the Science Complex computer labs; however, students may wish to download and install R/RStudio on their personal computers. R/RStudio is freely available and runs on both Windows and Mac machines. See the information on Courselink for where to obtain R/RStudio.

R Drop-In Help: Drop-in help for using RStudio is available Monday - Friday, 11 am – 1 pm in the SSC 1305. Students are expected to use this drop-in help as a primary resource for help with learning the R/RStudio software.

Calculators: Students are required to obtain a good, multi-variable calculator. Calculators will be needed to write the terms tests and final exam. It's a good idea to have a backup calculator available during tests that you know how to use.

Courselink: Course information and resources will be available on Courselink. Students are expected to check the website regularly for updated information and announcements.

Supported Learning Groups: This course will have associated Supported Learning Groups (SLGs), provided as part of the Peer Helper Program through the Library Learning Commons. More information about SLGs will be provided in lecture and posted on Courselink.

Course Policies

Email Communication Policies: For email communication, you must use your University of Guelph email account and include your name and student ID number in all correspondence. I will try to respond to emails within 3 business days. Emails that do not include a name and ID number or from non-uoguelph accounts, will not be answered.

Grading Policies:

Late Submission: Any quiz question not answered by the deadline will receive a mark of 0. Any late data analysis assignment will be accepted at a penalty of 5% per day late, up to a maximum of three days after the posted deadline. Assignment submitted beyond the three-day grace period will receive a grade of 0.

Policy for Missed Exams: Students who miss a term test for a valid reason must contact me within 3 business days of the missed test. You may be required to complete an alternative assessment or your final exam will be reweighted to make up for the missed term test.

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.

Regrade Request: Regrade requests must be submitted within **1 week** of a quiz/assignment/test being returned, after which regrade requests may no longer be submitted, and the quiz/assignment/test grade is 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. The regrade requests only can be sent to stat2040@uoguelph.ca . Instructions for submitting a regrade request will be posted on Courselink. Note that questions regarding course content or general course questions will not be answered through this email account.

Course Policy on Group Work:

The data analysis assignment can be completed individually or as a group of 2 or 3. While you are encouraged to share ideas and discuss approaches to assignment questions with others, your submitted assignment must be your own work. Copying any part of another student's or group's work is considered academic misconduct. I reserve the right to use Turnitin, integrated with Gradescope, to detect the possible plagiarism. Note that in the event one (or more) group member is unable to complete a data analysis assignment (due to illness, personal circumstances, etc.), all remaining group members are expected to complete and submit the assignment with the unavailable group member removed.

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.

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:

<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/academic-consideration-appeals-petitions/>

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://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/dropping-courses/>

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: <https://www.uoguelph.ca/sas>

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:

<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/academic-misconduct/>

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 that apply to undergraduate, graduate, and diploma programs:

<https://www.uoguelph.ca/registrar/calendars>

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

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

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:

Counseling Services: (x53244) is located at Health Services (J.T. Powell Building) and offers individual and group counselling sessions by appointment or walk-in.

Student Support Network: is located in Raithby House (across from the cannon) and offers confidential, peer-based, drop-in support.

Good2Talk: ([1-866-925-5454](tel: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](tel: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.