

Please 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. All University-wide decisions will be posted on the COVID-19 website <https://news.uoguelph.ca/2019-novel-coronavirus-information/>

**Illness:** The University will not normally require verification of illness (doctor's notes) for fall 2020 or winter 2021 semester courses. However, requests for Academic Consideration may still require medical documentation as appropriate.

## STAT\*3100 : Introductory Mathematical Statistics I

### Course Outline

**Instructor:** Ayesha Ali                      **Email:** aali@uoguelph.ca  
**Office:** MACN 509                              **Phone:** Ext. 53896

**Office Hours:**        Fridays 1:30 – 3:30 pm EST

**Asynchronous Component:** pre-recorded lectures available from Courselink

**Synchronous Component:** group meeting Wednesdays 1:00 – 2:20 pm EST

**Teaching Assistants:** Kayla Vanderkruk (vanderkk@uoguelph.ca)  
   Nicholas Wilker (nwilker@uoguelph.ca)  
   Chong Gan (ganc@uoguelph.ca)

**TA Office Hours:**    TBA

**Pre-requisites:**        (1 of IPS\*1510, MATH\*1210, MATH\*2080), (STAT\*2040 or STAT\*2120)

**Required Text:**

*John E. Freund's Mathematical Statistics with Applications*, 8<sup>th</sup> Ed., Miller & Miller, Pearson Education Canada.

**Recommended Texts:**

*Probability and Statistical Inference*, 8<sup>th</sup> Ed., Hogg and Tanis, Pearson Education, Inc. or

*Probability and Statistical Inference*, 9<sup>th</sup> Ed., Hogg, Tanis and Zimmerman, Pearson Education, Inc.

**Calendar Description:** Topics covered in this course include: Probability spaces; discrete and continuous random variables; multivariate distributions; expectations; moments, Chebyshev's inequality, product moments; sums of random variables, generating functions; Gamma, Beta, t and F distributions; central limit theorem; sampling distributions.

**Course Objectives and Outcomes:** The objective of this course is to provide students with a solid foundation in mathematical statistics, continuing from STAT\*2040. Students who have successfully completed this course will be expected to:

- Define random variables associated with outcomes of an experiment or a data generating process,

- Identify appropriate distribution to model behaviour of several types of random variables,
- Calculate expected values and variances of random variables associated with a given distribution,
- Calculate arbitrary moments of a distribution and product moments,
- Identify or derive the distribution of sums of random variables,
- Understand and apply Chebyshev's inequality to statistical problems, and
- Understand the concept of the central limit theorem and the sampling distribution of a statistic.

**Course Assessment:**

Participation	10%
Assignments (8, equally weighted)	30%
Tests (2, equally weighted)	30%
Final Exam	30%

**Schedule of Important Dates:**

Fri. Sep. 25	Assignment 1 due
Fri. Oct. 2	Assignment 2 due
Tues. Oct. 13	Assignment 3 due
<b>Wed. Oct. 21</b>	<b>Test 1</b>
Fri. Oct. 30	Assignment 4 due
Fri. Nov. 6	Assignment 5 due
Fri. Nov. 13	Assignment 6 due
<b>Wed. Nov. 18</b>	<b>Test 2</b>
Fri. Nov. 27	Assignment 7 due
Fri. Dec. 4	Assignment 8 due
<b>Thur. Dec. 17</b>	<b>FINAL EXAM (2:30-4:30 pm EST)</b>

**Participation:** Students are expected to participate in the scheduled synchronous group meetings. In these meetings, we will consider a problem and then split into groups to work on the problems. Some problems may be related to assignment questions. Each week a different student will be responsible to lead the discussion and/or take notes. Every student in the group will be asked to rate the other group members' participation, which will partially contribute to the participation component of your final grade.

**Assignments:** Assignments will be posted on Courselink and due by 11:59pm EST every week as noted in the Schedule of Important Dates. No late assignments will be accepted, and late or missed assignments will receive a grade of 0 automatically. Assignments will be submitted, marked (by TAs), and returned through Crowdmark. Therefore, queries on assignments should be sent to the TA. If you are unable to submit an assignment with a valid reason, **YOU MUST CONSULT THE LECTURER** and your mark will be based on the remaining assignments. Students are encouraged to discuss assignment questions with each other, but you are expected to complete the assignments yourself and to submit your own work. See below for the University of Guelph policies on Academic Misconduct.

Tests 1 and 2 will be held during pre-scheduled meeting times and therefore no student should have a conflict with the date or time. If a conflict exists for any test, it is your responsibility to resolve it immediately. Students who miss a test for a valid reason (e.g., medical illness) must contact me within 3 business days of the test and seek approval to have the weight of the missed test added to the weight of the final exam.

Any work that is submitted for regrading, I reserve the right to regrade the entire written component of the assignments and test, not just the question under consideration. The final exam (date and time) is scheduled by the Registrar's Office. If you miss the final exam for any reason, you must contact your

Program Counsellor for advice. University regulations require specific procedures to be followed regarding the conduct of final examinations, including resource, if any, for missed final examinations. These procedures are out of my control.

**Computing:** We may make use of the R statistical language. You are not required to be familiar with the software upon entering the course. There are several online tutorials available on the CRAN website to help you in this regard (<http://cran.r-project.org/>). The most recent version of R is also freely available from this site. However, I would provide you with a brief introduction of R and provide further guidance, as needed.

**Courselink:** Class announcements, assignments, handouts and partial lecture notes will be posted on Courselink and students are expected to regularly check the course website on Courselink for updates.

**E-mail Communication:** As per university regulations, all students are required to check their <mail.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:** Students will have until the **last day of classes** to drop courses without academic penalty. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. See respective Academic Calendars for course registration regulations and procedures.

Undergraduate Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Graduate Calendar - Registration Changes

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml>

Associate Diploma Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml>

**Accessibility:** The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment.

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.

More information: [www.uoguelph.ca/sas](http://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 a student intended to commit academic misconduct or not 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.](#)

**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.