



## COURSE OUTLINE

### 1. **Course:** STAT 321, Introduction to Probability - Fall 2021

Lecture 01: MWF 10:00 - 10:50 - Online

<b>Instructor</b>	<b>Email</b>	<b>Phone</b>	<b>Office</b>	<b>Hours</b>
Claudia Mahler	claudia.mahler@ucalgary.ca	403 220-7717	VIA ZOOM	M 14:00 -14:50

#### **Online Delivery Details:**

This course does not follow a scheduled meeting pattern.

- **Lectures** will take place via Zoom meetings during our regularly scheduled lecture times. **All Zoom lectures will be recorded and posted to D2L.**
- **Labs** will involve no scheduled Zoom meetings. It is expected that you complete the lab worksheets on your own time when it is convenient for you.
- **Office hours** with TAs and/or your instructor will be held via scheduled Zoom meetings and/or via live office hours.

#### **Course Site:**

**D2L:** STAT 321 L01 - (Fall 2021) - Introduction to Probability

**WeBWork:** STAT 321 Fall 2021

**Note:** Students must use their U of C account for all course correspondence.

### 2. **Requisites:**

See section [3.5.C](#) in the Faculty of Science section of the online Calendar.

#### **Prerequisite(s):**

Mathematics 267 or 277.

#### **Antirequisite(s):**

Credit for Statistics 321 and either Engineering 319 or Mathematics 321 will not be allowed.

#### **Note(s):**

- Statistics 205, 213, 217, and 327 are not available to students who have previous credit for one of Statistics 321 or Engineering 319 or are concurrently enrolled in Statistics 321 or Engineering 319.

### 3. **Grading:**

The University policy on grading and related matters is described in [F.1](#) and [F.2](#) of the online University Calendar.

In determining the overall grade in the course the following weights will be used:

Component(s)	Weighting %	Dates
Assignments (4 - equally weighted)	30%	Assignment 1: September 27 Assignment 2: October 18 Assignment 3: November 1 Assignment 4: November 29 <i>(All dates tentative)</i>
Quizzes (4)	70%	Quiz 1: October 7 (20%) Quiz 2: October 28 (20%) Quiz 3: November 25 (20%) Quiz 4: December 8 (10%) <i>(All dates tentative)</i>

Assignments and quizzes will be submitted for grading through D2L's dropbox feature.

**For assignments:**

Assignment questions will be posted to D2L at least a week before they are due. Assignments can either be typed or neatly handwritten for submission. To submit handwritten assignments to the D2L dropbox, students can do one of the following:

- Scan the pages containing their written work and upload the scans as one document/image or upload each page as its own document/image
- Take pictures of the pages containing their written work and upload the pictures as one set of images or upload each picture as its own image

**It is the responsibility of the student to ensure that the scans/pictures are uploaded correctly.** That is, the students must ensure the scans/pictures are **readable** and are **uploaded in the correct orientation** (so that the scans/pictures do not need to be rotated in order to be read and graded).

**For quizzes:**

**The relevant quiz document will be emailed to the students at midnight on the day of the quiz. Students will then have until 11:59 PM on the day of the quiz to upload the completed quiz questions to the relevant D2L dropbox.** For example, the Quiz 1 questions will be emailed to students at midnight (12:00 AM or 0:00) on May 17. Students will then have until 11:59 PM (or 23:59) that day to upload the completed quiz to the D2L dropbox.

The quiz document will have space for students to fill in their answers. If a student wishes to do so, they can fill out the quiz on the quiz paper or they can complete the quiz questions on blank pieces of paper, provided that the questions and question parts are clearly labeled on the pieces of paper.

Quizzes can either be typed up (or filled in using something like OneNote) or handwritten for submission. **The same guidelines stated above for handwritten assignment submissions apply for handwritten quiz submissions.**

**Students with SAS accommodations** are asked to contact their instructor as soon as possible to discuss their needed accommodations. All other accommodations for students will be made on a case-by-case basis.

**A passing mark (at least 50%) on at least three of the four quizzes is required to earn a minimum grade of C- in the course.**

Requests for grade rounding or alterations to grade component weighting will not be considered. Also note that **all letter grade cutoffs are fixed and will not be adjusted on an individual basis** (e.g., 90.0% is a cutoff for an A, not 89.9% or 89.8%!).

Each piece of work (reports, assignments, quizzes, midterm exam(s) or final examination) submitted by the student will be assigned a grade. The student's grade for each component listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade.

The conversion between a percentage grade and letter grade is as follows.

	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
<b>Minimum % Required</b>	95 %	90 %	85 %	80%	76%	72 %	68 %	64%	60%	55 %	50 %

The University of Calgary offers a [flexible grade option](#), Credit Granted (CG) to support student's breadth of learning and student wellness. Faculty units may have additional requirements or restrictions for the use of the CG grade at the faculty, degree or program level. To see the full list of Faculty of Science courses where CG is not eligible, please visit the following website: <https://science.ucalgary.ca/current-students/undergraduate/program-advising/flexible-grading-option-cg-grade>

#### 4. **Missed Components Of Term Work:**

The university has suspended the requirement for students to provide evidence for absences. Please do not attend medical clinics for medical notes or Commissioners for Oaths for statutory declarations.

In the event that a student legitimately fails to submit any online assessment on time (e.g. due to illness etc...), please contact the course coordinator, or the course instructor if this course does not have a coordinator to arrange for a re-adjustment of a submission date. Absences not reported within 48 hours will not be accommodated. If an excused absence is approved, one possible arrangement is that the percentage weight of the legitimately missed assignment could also be pro-rated among the components of the course. This option is at the discretion of the coordinator and may not be a viable option based on the design of this course.

It is the responsibility of the student to clearly communicate with the instructor **before** (if possible) or **directly after** (within 48 hours) any crises or extenuating circumstances have occurred so that proper arrangements can be made for missed work.

#### 5. **Scheduled Out-of-Class Activities:**

There are no scheduled out of class activities for this course.

#### 6. **Course Materials:**

Required Textbook(s):

Wackerly, Dennis, Mendenhall, William, Scheaffer, Richard L., *Mathematical Statistics with Applications, 7th Edition*: Duxbury Br..

**R Software:** students will make use of R statistical software throughout the course. R is free and can be downloaded at <https://www.r-project.org/>.

Any material posted to the D2L website is under copyright protection. **Students are not permitted to redistribute any of the material they find there to anyone who is not registered in the Fall 2021 STAT 321 course.** This includes (but is not limited to) distributing course notes, videos, practice problems, and exam questions.

In order to successfully engage in their learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology:

- A computer with a supported operating system, as well as the latest security, and malware updates;
- A current and updated web browser;
- Webcam/Camera (built-in or external);
- Microphone and speaker (built-in or external), or headset with microphone;
- Current antivirus and/or firewall software enabled;
- Stable internet connection.

For more information please refer to the UofC [ELearning](#) online website.

#### 7. **Examination Policy:**

Students are expected to work **independently** on all quizzes but can consider the quizzes "open book" (that is, students can use their notes, lecture videos, other online resources and calculators, etc.).

An additional document will be posted on D2L as to what constitutes permissible resources to use on quizzes **it is the student's responsibility to read this document and be familiar with what is and isn't allowed to be used on quizzes.**

Students should also read the Calendar, [Section G](#), on Examinations.

#### 8. **Approved Mandatory And Optional Course Supplemental Fees:**

There are no mandatory or optional course supplemental fees for this course.

## 9. Writing Across The Curriculum Statement:

For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of the work. See also Section [E.2](#) of the University Calendar.

## 10. Human Studies Statement:

Students will not participate as subjects or researchers in human studies.

See also [Section E.5](#) of the University Calendar.

## 11. Reappraisal Of Grades:

A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See [Section I.3](#) of the University Calendar.

- a. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **ten business days** of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall submit the Reappraisal of Graded Term work form to the department in which the course is offered within 2 business days of receiving the decision from the instructor. The Department will arrange for a reappraisal of the work within the next ten business days. The reappraisal will only be considered if the student provides a detailed rationale that outlines where and for what reason an error is suspected. See sections [I.1](#) and [I.2](#) of the University Calendar
- b. **Final Exam:** The student shall submit the request to Enrolment Services. See [Section I.3](#) of the University Calendar.

## 12. Other Important Information For Students:

- a. **Mental Health** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, [Mental Health Services Website](#)) and the Campus Mental Health Strategy website ([Mental Health](#)).
- b. **SU Wellness Services:** For more information, see [www.ucalgary.ca/wellnesscentre](http://www.ucalgary.ca/wellnesscentre) or call [403-210-9355](tel:403-210-9355).
- c. **Sexual Violence:** The Sexual Violence Support Advocate, Carla Bertsch, can provide confidential support and information regarding sexual violence to all members of the university community. Carla can be reached by email ([syva@ucalgary.ca](mailto:syva@ucalgary.ca)) or phone at [403-220-2208](tel:403-220-2208). The complete University of Calgary policy on sexual violence can be viewed at (<https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Sexual-and-Gender-Based-Violence-Policy.pdf>)
- d. **Misconduct:** Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. We expect members of our community to act with integrity. Research integrity, ethics, and principles of conduct are key to academic integrity. Members of our campus community are required to abide by our institutional [Code of Conduct](#) and promote academic integrity in upholding the University of Calgary's reputation of excellence. Some examples of academic misconduct include but are not limited to: posting course material to online platforms or file sharing without the course instructor's consent; submitting or presenting work as if it were the student's own work; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. Please read the following to inform yourself more on academic integrity:

[Student Handbook on Academic Integrity](#)  
Student Academic Misconduct [Policy](#) and [Procedure](#)  
[Research Integrity Policy](#)

Additional information is available on the [Student Success Centre Academic Integrity page](#)

### e. Academic Accommodation Policy:

It is the student's responsibility to request academic accommodations according to the University policies

and procedures listed below. The student accommodation policy can be found at: <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Accommodation-Policy.pdf>

Students needing an accommodation because of a disability or medical condition should communicate this need to Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities: <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Accommodation-for-Students-with-Disabilities-Procedure.pdf>.

Students needing an accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, by filling out the [Request for Academic Accommodation Form](#) and sending it to Mark Bauer by email [bauerm@ucalgary.ca](mailto:bauerm@ucalgary.ca) preferably 10 business days before the due date of an assessment or scheduled absence.

- f. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPPA). Students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information, see [Legal Services](#) website.
- g. **Student Union Information:** [VP Academic](#), Phone: [403-220-3911](tel:403-220-3911) Email: [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca). SU Faculty Rep., Phone: [403-220-3913](tel:403-220-3913) Email: [sciencerep@su.ucalgary.ca](mailto:sciencerep@su.ucalgary.ca). [Student Ombudsman](#), Email: [ombuds@ucalgary.ca](mailto:ombuds@ucalgary.ca).
- h. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction ([USRI](#)) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.
- i. **Copyright of Course Materials:** All course materials (including those posted on the course D2L site, a course website, or used in any teaching activity such as (but not limited to) examinations, quizzes, assignments, laboratory manuals, lecture slides or lecture materials and other course notes) are protected by law. These materials are for the sole use of students registered in this course and must not be redistributed. Sharing these materials with anyone else would be a breach of the terms and conditions governing student access to D2L, as well as a violation of the copyright in these materials, and may be pursued as a case of student academic or [non-academic misconduct](#), in addition to any other remedies available at law.

#### Course Outcomes:

- Define a random experiment; conceptualize its sample space and the various events the random experiment could produce.
- Apply various laws of probability to solve probability problems that are framed in both theoretical and applied contexts
- Read, replicate, and create mathematical proofs of probability theorems covered in the course
- Recognition of quantification of random events through the creation of a random variable ; employment of probability foundations to design a probability model of a random variable
- Differentiation between discrete and continuous random variables, analysis of the random variable' s properties through an examination of its distribution shape, its measure of centre (mean/expected value), and its measure of spread (variance or standard deviation)
- Derivation of a moment generation function and subsequent employment of calculus methods to compute the moments of a random variable.
- Differentiate between when to apply the various probability models covered in the course (Bernoulli, Binomial, Negative Binomial, Geometric, Hypergeometric, Poisson, Normal, Gamma and its special cases (Chi-square and Exponential)). In addition, demonstrate application of such probability models to compute probabilities
- Recognize the synergies between two random variables through the visualization of their joint probability distribution function and its employment to compute simultaneous probabilities and derive conditional distribution functions
- Distinguish between dependence and independence of a pair of random variables and compute the covariance between the random variables.
- Statement and application of the Central Limit Theorem to both the sample mean and the sample proportion in order to consider the probable (and improbable) values of these statistics

Electronically Approved - Sep 08 2021 10:45

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**Department Approval**

Electronically Approved - Sep 10 2021 10:39

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**Associate Dean's Approval**