



COURSE OUTLINE

1. **Course:** STAT 421, Mathematical Statistics - Fall 2020

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

Instructor	Email	Phone	Office	Hours
Dr Alexander De Leon	adeleon@ucalgary.ca	403 220-6782	MS 588	MWF, 11am-12nn, 1-2pm

Online Delivery Details:

This course is being offered online in real-time via scheduled meeting times, you are required to be online at the same time.

Lectures for the course will take place online on Zoom on MWF, 10 - 10:50 a.m. I will provide the Zoom link along with the meeting ID/passcode on D2L.

I will also be available on Zoom during my **office hours**, MWF, 11am-12nn and 1-2pm, the link and meeting ID/passcode for which I will likewise post on D2L.

Although attendance will not be checked, students are encouraged to attend the online lectures. The lectures will not be recorded; however, students are welcome to record them. If a student is unable to attend a lecture, he/she is responsible for making arrangements for recording the missed lecture.

Course Site:

D2L: STAT 421 L01-(Fall 2020)-Mathematical Statistics

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):

Statistics 323.

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 %	Date
Assignments	30	Every 2-3 weeks (6 assignments)
Midterm Test	30	November 4, 2020
Final Test	40	To be determined

Both midterm and final tests will be "take-home" exams. The midterm test will be available on D2L at the end of lecture on Wednesday, November 4, 2020, and students are given 24 hours to complete it, and should email their completed tests as PDF files to adeleon@ucalgary.ca by 10am, Thursday, November 5, 2020.

The final test will be scheduled during the final exam period. To complete the test, students will have 30 hours from the date/time it is made available on D2L. Students will need to email their completed tests as PDF files to adeleon@ucalgary.ca before the end of the 30-hour completion period.

Students are encouraged but are not required to prepare their assignments and completed tests using a word processor (e.g., Microsoft Word) or a document preparation software (e.g., LaTeX). Handwritten work is perfectly acceptable, provided an electronic copy in PDF format is available (e.g., created using a cell phone camera) for email submission.

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
Minimum % Required	95 %	88 %	84 %	80%	76%	72 %	68 %	64%	60%	55 %	50 %

This course has a registrar scheduled final exam.

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, then the percentage weight of the legitimately missed assignment could also be pro-rated among the components of the course.

5. Scheduled Out-of-Class Activities:

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

6. Course Materials:

Recommended Textbook(s):

R. V. Hogg, J. W. McKean & A. T. Craig, *Introduction to Mathematical Statistics (7th ed)*: Pearson, 2012.

Lecture slides will be posted on D2L days before the lecture date. Handouts and other relevant supplementary materials will also be available on D2L.

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:

1. The midterm and final tests are "take-home" exams, and students are allowed use of their textbook, the lecture slides, their notes, etc.
2. The completed test that a student submits is original work with the student's name on it. Students should avoid submitting shoddily written work as it reflects poorly on them and their work ethic.
3. Completed tests submitted by students should be readable and understandable to the grader, where every step in a problem's solution is explained in detail, and written up in grammatical English. Grammar and spelling are of the utmost importance.
4. With ample time given to complete a test, there is no excuse to submit what appears to be **rough draft!** Students should re-read and re-write their solutions to fix up any confusing passages and logical gaps, before finalizing and submitting their completed test.

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 Center:** For more information, see 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 (svsa@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/policies/files/policies/sexual-violence-policy.pdf>)
- d. **Misconduct:** Academic misconduct (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under [Section K](#). Student Misconduct to inform yourself of definitions, processes and penalties. Examples of academic misconduct may include: submitting or presenting work as if it were the student's own work when it is not; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; collaborating in whole or in part without prior agreement of the instructor; borrowing experimental values from others without the instructor's approval; falsification/ fabrication of experimental values in a report. **These are only examples.**
- e. **Academic Accommodation Policy:** Students needing an accommodation because of a disability or medical condition should contact Student Accessibility Services in accordance with the procedure for accommodations for students with disabilities available at [procedure-for-accommodations-for-students-with-disabilities.pdf](#).

Students needing an accommodation in relation to their coursework or to fulfill requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Associate Head of the Department of Mathematics & Statistics, Mark Bauer by email bauerm@ucalgary.ca or phone [403-220-4189](tel:403-220-4189). Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than **14 days** prior to the date in question. See [Section E.4](#) of the University Calendar.

- f. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). 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](#) Email: suvpaca@ucalgary.ca. SU Faculty Rep., Phone: [403-220-3913](#) Email: sciencerep@su.ucalgary.ca. [Student Ombudsman](#), Email: 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.

I will respond to students' email inquiries about the course within 24 hours except on weekends and holidays. Please note that students must use their U of C account for all course correspondence.

Students should email me during the completion period for a test, for clarifications regarding problems in the test, if any, that they find unclear.

Course Outcomes:

- derive distributions of functions of random variables by applying the change of variable technique, the cumulative distribution function technique, and the moment generating function technique;
- define a random sample and statistics (including estimators and order statistics) and obtain their sampling distributions
- define the multivariate normal distribution and explain some of its applications;
- use different modes of convergence (i.e., convergence in probability, convergence in distributions) and well-known asymptotic results (e.g., Weak Law of Large Numbers, Central Limit Theorem) to study large-sample properties of estimators (e.g., limiting and asymptotic distributions);
- apply the concepts of sufficiency and completeness to derive minimum variance unbiased estimators;
- define most powerful (MP), uniformly most powerful (UMP), and likelihood ratio tests and obtain them via, e.g., the Neyman-Pearson Theorem;
- obtain and apply chi-square goodness-of-fit tests, analysis of variance, regression analysis, the chi-square test of independence, the sign test and some nonparametric tests;
- define the prior and posterior distributions, a conjugate prior, and predictive distributions;
- apply the statistical software R for carrying out probability and statistical calculations.

Electronically Approved - Sep 03 2020 15:24

Department Approval