



COURSE OUTLINE

1. **Course:** STAT 323, Introduction to Theoretical Statistics - Summer 2021

Lecture 01: MWF 14:00 - 15:50 - Online

Instructor	Email	Phone	Office	Hours
Scott Robison	sarobiso@ucalgary.ca	N/A	MS 590	Please see D2L->communication->zoom for posted times and links

Online Delivery Details:

Some aspects of this course are being offered in real-time via scheduled meeting times. For those aspects you are required to be online at the same time.

To help ensure Zoom sessions are private, do not share the Zoom link or password with others, or on any social media platforms. Zoom links and passwords are only intended for students registered in the course. Zoom recordings and materials presented in Zoom, including any teaching materials, must not be shared, distributed or published without the instructor's permission.

Course Materials including: readings, notebooks, videos, and R-Studio software code etc. will be posted via the D2L course website. Although, students are not required to be online simultaneously (synchronously) it will be required that students view/complete all scheduled course components on the same day that they are assigned (reference the D2L calendar for details).

Asking Questions: many students will have additional questions, especially regarding assignment problems or course content. These questions should be asked on the relevant **Discussion Boards** on D2L, where Instructors, TA's, and peers can contribute and curate answer(s) to these questions centralizing, reducing duplication, and improving answer consistency.

TA office hours will also be held Monday, Wednesday, Friday from 1pm-3pm (our classes scheduled meeting time), for **live time questioning** and availability.

Conversations of a personal or private nature may be conducted through email, and we will make every effort to respond in a timely manner within one working day. We ask for your patience, professionalism, and respect during communication.

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.

Course Site:

D2L: STAT 323 L01-(Summer 2021)-Introduction to Theoretical Statistics

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

Any material that is posted on the D2L website is under copyright protection, students are not permitted to redistribute any of the material they find there to anyone not in this semester's class.

Any material that is posted on D2L is subject to be taken down within two weeks of the posted date, so do not use D2L as your digital storage space. Do not expect that you will have access to the D2L page beyond the End of Classes date (Aug. 11, 2021). Download any material you would like to your personal devices before they are removed from the website.

2. **Requisites:**

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

Prerequisite(s):

Statistics 321.

Antirequisite(s):

Credit for Statistics 323 and either Data Science 305 or Mathematics 323 will not be allowed.

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 %	Details	Date
Assignments (*Best 5 of 6)	50% (equal weight 10% each, your lowest assignment grade will not count)	<p>Assignments are permitted to be handed in groups or individually. The groups may not be larger than 3 students. Groups can be changed or reformed from assignment to assignment.</p> <p>Only one submission for the group is permitted and all members of the group must be clearly labeled on the front page.</p> <p>Each member of the group will receive the same grade as the other group members.</p> <p>In the event a group larger than three submits an assignment all of the members of that group will receive a score of zero.</p> <p>No student may submit any one assignment more than once; meaning no student can be a member of more than one group.</p> <p>The whole of the assignment may not be graded. Only randomly selected questions will be marked. However, the same randomly selected questions will be selected for each student.</p>	<p>digitally "handed in" uploaded to Gradescope (If the assignment is late or not properly submitted a zero score will be assigned)</p> <hr/> <p>Assignment 1: July 10 Assignment 2: July 17 Assignment 3: July 24 Assignment 4: July 31 Assignment 5: Aug. 7 Assignment 6: Aug. 11</p>
Quizzes (4)	50%	<p>Worst two quiz scores will be worth 10% each.</p> <p>Best two quiz scores will be worth 15% each.</p> <p>Quizzes will be written individually (not in groups) and may be cumulative.</p>	<p>digitally "handed in" uploaded to Gradescope (If the quiz is late or not properly submitted a zero score will be assigned) (24 hour given to complete an expected ~50-120 min assessment)</p> <hr/> <p>Quiz 1: July 15 Quiz 2: July 22 Quiz 3: Aug. 5 Quiz 4: Aug. 11</p>

***If Quiz(zes) is/are missing/late unnamed or unsigned they will be scored as 0%.**

****Although, the Quiz(zes) will have a 24 hour work period please note that this due date is 24 hours from the granted availability of the quiz and not from when the student first opens the file. This means all students will have the same 24 hour period in which to work on their Quiz and the due date is the same for everyone.**

*****Once a Quiz is submitted there is no ability to have it unsubmitted for edits or alterations.**

******Once an assessment (assignment or quiz) is submitted, graded, or recorded it counts! There is no ability to apply retroactive situations or request alternate grading schemes after a course component has been submitted.**

*******If these dates cannot work for you please arrange (sarobiso@ucalgary.ca) an alternate time to write these exams prior (at least one week) to the date(s) in question. Of course, valid reasons will be accommodated, however, simple matters of preference will not be accommodated.**

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 %	90 %	85 %	80%	75%	70 %	65 %	60%	55%	54.99 %	50 %

Any course components that are **late or missing will be given a score of 0%**.

The grade will be calculated as stipulated above, any/all requests to have **alternate grade weighting or assignments will be denied**.

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 **your** job to communicate clearly with your instructor **before** (if possible) or **directly after (<48 hours) crisis or extenuating circumstance has occurred**. Simply missing or not being aware of time (time zones) is not a valid justification. This includes: any **course conflicts** or **work schedules** etc.

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

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

6. **Course Materials:**

Recommended Textbook(s):

Wackerly, *Mathematical Statistics with Applications 7e*: Duxbury Pr.

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 may in no way (including any homework or internet sites) communicate with each other or with anyone else about quiz material, during the exam process .

The quizzes may be considered "open book," however, the course D2L site **will not** be accessible during exam times.

Students are encouraged to use mathematical/statistical software ex. R or R Studio, Wolfram Alpha etc., however, you are expected to **show your supporting work** for full marks. Correct answers that fail to display **clear and concise** evidence and explanation of answers **will not** be given full credit and possibly no credit at all.

Your work must be submitted correctly to indicated respective assessment tool ie. **Gradescope, D2L** or **WeBWork** platforms to be eligible of any credit. Attempting to not submit on time (before deadlines, even if only second(s) late) will result in zero earned credit. Inability to submit/upload the assessments correctly will also result in zero credit.

You may also be expected to sign an accompanying academic integrity affidavit (legal declaration under oath) for each submitted assessment (assignment, quiz, or exam) swearing to the fact that no academic misconduct has occurred. **Any submitted works void of a valid signed affidavit(s) will not be assessed and a score of zero** will be assigned.

Any submitted work must be **legible**, display an organized expected and **readable flow**, contain a consistent and **singular solution**. Any solutions that appear to contain multiple answers or attempt to commit to multiple inconsistent answers will result in zero credit. ex. trying to indicate both True and False; selecting A and B in multiple choice format; or Answers that contain both correct and incorrect answers the correct final answer must be **clearly be indicated** (with supporting work that lead to that response).

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.

For graded assessment work that is submitted via grade scope, you are expected to **show your supporting work** for full marks. Correct answers that fail to display **clear and concise** evidence and explanation of answers will **not** be given full credit and possibly no credit at all.

Your work must be submitted correctly to indicated respective assessment tool ie. **Gradescope, D2L** or **WeBWork** platforms to be eligible of any credit. Attempting to not submit on time (before deadlines, even if only second(s) late) will result in zero earned credit. Inability to submit/upload the assessments correctly will also result in zero credit.

You may also be expected to sign an accompanying academic integrity affidavit (legal declaration under oath) for each submitted assessment (assignment, quiz, or exam) swearing to the fact that no academic misconduct has occurred. **Any submitted works void of a valid signed affidavit(s) will not be assessed and a score of zero** will be assigned.

Any submitted work must be **legible**, display an organized expected and **readable flow**, contain a consistent and **singular solution**. Any solutions that appear to contain multiple answers or attempt to commit to multiple inconsistent answers will result in zero credit. ex. trying to indicate both True and False; selecting A and B in multiple choice format; or Answers that contain both correct and incorrect answers the correct final answer must be **clearly be indicated** (with supporting work that lead to that response).

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 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) 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 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:** 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 (FOIP). 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. SU Faculty

- 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:

- Identify a target population and its corresponding target parameter
- Apply the method of moments and maximum likelihood estimation to derive a statistic to estimate a target parameter
- Derive the probability distribution of a statistic and compute both its mean, its variance or standard deviation, and its bias.
- Evaluate the large -sample merits of a statistic based on its (i) biased/unbiasedness and (ii) its consistency/lack of consistency, to determine its usefulness
- Read, replicate, and create mathematical proofs of statistical theorems covered in the course
- Recognize parameter estimation through the application of the pivotal quantity method to create a confidence interval for the unknown value of a population parameter. This is to include parametric estimation of the mean, proportion, variance, difference of two means, difference of two proportions, and ratio of variances.
- Comprehend the scientific method of statistical hypothesis testing. This is to include the derivation of a statistical hypotheses, identification and subsequent application of a statistical test, to be encapsulated with the computation and interpretation of a P - value.
- Conduct dual population comparisons through the application of both confidence intervals and hypothesis testing to compare (i) two population means and (ii) two population proportions. Such applications are expected to be done manually and with the assistance of R.
- Model the existing synergy between two quantitative variables through the employment of least- squares estimation , resulting in the creation of a statistical model that predicts one variable based on the value of another
- Conduct a statistical hypothesis on the appropriateness of the simple linear model with both the t -test and F-test. Awareness of the conditions of the linear model as well as diagnosis of their satisfaction. Confidence interval estimation of both the mean and an individual value of the response variable.

Electronically Approved - Jun 30 2021 11:08

Department Approval

Electronically Approved - Jun 30 2021 16:10

Associate Dean's Approval