



### COURSE OUTLINE

1. **Course:** STAT 213, Introduction to Statistics I - Fall 2022

**Coordinator(s)**

| Name           | Email                      | Phone        | Office | Hours   |
|----------------|----------------------------|--------------|--------|---|
| Claudia Mahler | claudia.mahler@ucalgary.ca | 403 220-7717 | MS 376 | Mondays 16:00 - 17:00 (via Zoom) and<br>Fridays 12:00 - 13:30 (in-person) |

**Section(s)**

Lecture 01 : MWF 09:00 - 09:50 in MFH 162

| Instructor     | Email                      | Phone        | Office | Hours   |
|----------------|----------------------------|--------------|--------|---|
| Claudia Mahler | claudia.mahler@ucalgary.ca | 403 220-7717 | MS 376 | Mondays 16:00 - 17:00 (via Zoom) and<br>Fridays 12:00 - 13:30 (in-person) |

Lecture 02 : MWF 08:00 - 08:50 in ST 141

| Instructor    | Email                | Phone | Office | Hours                 |
|---------------|----------------------|-------|--------|-----------------------|
| Scott Robison | sarobiso@ucalgary.ca | N/A   | MS 590 | Via Discussion Boards |

Lecture 03 : TR 09:30 - 10:45 in ENC 70

| Instructor    | Email                    | Phone        | Office             | Hours  |
|---------------|--------------------------|--------------|--------------------|--|
| Dr. Sang Kang | sangjin.kang@ucalgary.ca | 403 210-8697 | MS 364/VIA<br>ZOOM | ACSC 325: 11:30 am~12:30 pm (Mon, Wed,<br>Fri) / ACSC 425: 3 pm~4 pm (Mon, Wed, Fri) /<br>STAT 213: 11:30 am~1 pm (Tue, Thu) |

Lecture 04 : TR 12:30 - 13:45 in ENG 60

| Instructor               | Email                         | Phone        | Office | Hours |
|--------------------------|-------------------------------|--------------|--------|-------|
| Dr. Thuntida<br>Ngamkham | thuntida.ngamkham@ucalgary.ca | 403 220-6305 | MS 550 | TBA   |

Lecture 05 : MWF 14:00 - 14:50 in ST 145

| Instructor    | Email                | Phone | Office | Hours                 |
|---------------|----------------------|-------|--------|-----------------------|
| Scott Robison | sarobiso@ucalgary.ca | N/A   | MS 590 | Via Discussion Boards |

To account for any necessary transition to remote learning for the current semester, courses with in-person lectures, labs, or tutorials may be shifted to remote delivery for a certain period of time. In addition, adjustments may be made to the modality and format of assessments and deadlines, as well as to other course components and/or requirements, so that all coursework tasks are in line with the necessary and evolving health precautions for all involved (students and staff).

**In Person Delivery Details:**

All **lectures** will be delivered **in-person** during the scheduled days/times in the scheduled lecture rooms.

**All course material** (course note packets, lab material, R code, study guides, additional readings and practice, etc.) **will be available on D2L.**

**Re-Entry Protocol for Labs and Classrooms:**

To limit the spread of COVID-19 on campus, the University of Calgary has implemented safety measures to ensure the campus is a safe and welcoming space for students, faculty and staff. The most current safety information for campus can be found [here](#). **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.

All **graded assessments** will be delivered **online**.

**Midterm will be held synchronously, meaning students will be required to complete the midterms online during a specified window of time.** More details are described below.

While students will not be required to be online simultaneously (synchronously) for other course components, **it will be required that students complete scheduled course components within the time period they are available** (please refer to the schedule posted on D2L for further details).

**Students will be encouraged to utilize the D2L discussion boards for asking questions about the course content, assignment problems, etc.** This is to allow instructors, TAs, and other students the opportunity to answer questions and to allow students to see responses to questions that they may have. Questions/concerns of a personal or private nature may be conducted through email, and a sincere effort will be made to respond to these emails within a 24-hour window.

**Office hours** with TAs or instructors will be conducted via scheduled in-person and/or Zoom meeting times.

**Course Site:**

**D2L:** STAT 213 L01 - L05 (Fall 2022) - Introduction to Statistics I

**WeBWork:** STAT 213

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

**Equity Diversity & Inclusion:**

The University of Calgary is committed to creating an equitable, diverse and inclusive campus, and condemns harm and discrimination of any form. We value all persons regardless of their race, gender, ethnicity, age, LGBTQIA2S+ identity and expression, disability, religion, spirituality, and socioeconomic status. The Faculty of Science strives to extend these values in every aspect of our courses, research, and teachings to better promote academic excellence and foster belonging for all.

2. **Requisites:**

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

**Prerequisite(s):**

Mathematics 30-1 or Mathematics 2 (offered by Continuing Education).

**Antirequisite(s):**

Credit for Statistics 213 and either Statistics 205 or 327 will not be allowed. Not available to students who have previous credit for one of Statistics 321, Engineering 319 or Digital Engineering 319 or are concurrently enrolled in Statistics 321, Engineering 319 or Digital 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:

| Course Component            | Weight | Due Date (duration for exams)        | Modality for exams | Location for exams |
|-----------------------------|--------|--------------------------------------|--------------------|--------------------|
| Lab Exercises (best 6 of 8) | 10%    | Ongoing                              |                    |                    |
| Lab Quizzes (best 6 of 8)   | 20%    | Ongoing                              |                    |                    |
| Assignments (best 6 of 7)   | 30%    | Ongoing                              |                    |                    |
| Midterm 1 <sup>1</sup>      | 13.33% | Oct 05 2022 at 02:00 pm (75 Minutes) | online             | Online             |
| Midterm 2 <sup>2</sup>      | 13.33% | Nov 02 2022 at 02:00 pm (75 Minutes) | online             | Online             |
| Midterm 3 <sup>3</sup>      | 13.34% | Dec 07 2022 at 02:00 pm (75 Minutes) | online             | Online             |

<sup>1</sup> This midterm will have a 75-minute timer once opened, but will be available to be opened any time between 2:00 PM and 8:00 PM on the scheduled day. You can take the midterm at any time during that availability window but it must be submitted prior to 8:00 PM.

<sup>2</sup> This midterm will have a 75-minute timer once opened, but will be available to be opened any time between 2:00 PM and 8:00 PM on the scheduled day. You can take the midterm at any time during that availability window but it must be submitted prior to 8:00 PM.

<sup>3</sup> This midterm will have a 75-minute timer once opened, but will be available to be opened any time between 2:00 PM and 8:00 PM on the scheduled day. You can take the midterm at any time during that availability window but it must be submitted prior to 8:00 PM.

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% | 75% | 70 % | 65 % | 60% | 55% | 54 % | 50 % |

A grade of D (50%) or above is considered "passing." A grade of C- (55%) or above is needed to use this course as a prerequisite for other courses.

**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%!).**

**Assignments:** assignments are not timed and can be accessed as many times as a student wishes before the due date. All assignments will be completed and submitted through WeBWork. **The best-scoring six of seven assignments will be counted towards the assignment grade component. A missed assignment will be given a grade of 0%.**

**Lab Exercises:** each lab exercise will be made available on WeBWork a week before they are due . For example Lab Exercise 1 will be available from 12 AM Wednesday, September 14 until 11:59 PM Wednesday, September 21. The exercises are designed to take approximately 25 minutes, but students may use as much time as they wish during the week-long availability to complete them. A student can access a lab exercise as many times as they wish within the week-long period. **The best-scoring six of eight lab exercises will be counted towards the lab exercise grade component.** A missed lab exercise will be given a grade of 0%.

**Lab Quizzes:** each lab quiz will be made available on WeBWork for a given 24-hour period, but must be completed within a 50-minute period of being accessed. For example, Lab Quiz 1 will be available from 12 AM Wednesday September 21 until 11:59 PM Wednesday, September 21. Once the quiz is opened, the student will have 50 minutes to complete and submit the quiz. The quizzes are designed to take approximately 25 minutes, but students may use up to 50 minutes to complete them. **The best-scoring six of eight lab quizzes will be counted towards the lab quiz grade component.** A missed lab quiz will be given a grade of 0%.

**Midterms:** Each midterm will be available on WeBWork for a specific 75-minute period. The midterms are designed to take approximately 45-50 minutes, but students may use up to the available 75 minutes to complete them. A student can access a midterm any time during the given 75-minute period, but the midterm must be submitted before the 75 minutes are up. The midterm will automatically close at the end of the 75-minute period. **All three midterms will be counted towards the midterm grade component.** A missed midterm will be given a grade of 0%.

Course components that are missing or late will be given a score of 0%. Any requests to have alternate grade weighting or assessments will be denied.

**For timed assessments (quizzes, midterms), time will be adjusted for SAS students if needed. In**

**addition, accommodations for students with issues with scheduled times/dates (e.g., schedule conflict, caregiving responsibilities, ability to secure an appropriate test-taking environment) will be applied on a case-by-case basis. Please email the course coordinator, Claudia Mahler (claudia.mahler@ucalgary.ca) at least one week prior to the assessment(s) in question in order to arrange accommodations. Please note that only valid reasons will be accommodated.**

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 your course coordinator **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.

Note that missing a due date as a result of not being aware of when the component is due, other course due dates, or work schedule conflicts is not considered a valid justification for additional arrangements.

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

The following out of class activities are scheduled for this course.

| Activity    | Location    | Date and Time                          | Duration   |
|-------------|-------------|--|------------|
| Midterm - 1 | Online Exam | Wednesday, October 5, 2022 at 2:00 pm  | 75 Minutes |
| Midterm - 2 | Online Exam | Wednesday, November 2, 2022 at 2:00 pm | 75 Minutes |
| Midterm - 3 | Online Exam | Wednesday, December 7, 2022 at 2:00 pm | 75 Minutes |

**REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY.** If you have a conflict with the out-of-class-time-activity, please contact your course coordinator/instructor no later than **14 days prior** to the date of the out-of-class activity so that alternative arrangements may be made.

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

There is no textbook associated with this course. Students should instead plan on utilizing the materials (note packets, lecture videos, R code, etc.) on D2L.

**WebWork:** WebWork will be used for online assignments, labs, lab quizzes, and midterms. There is no cost to use WebWork.

**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 2022 STAT 213 course.** This includes (but is not limited to) posting material/questions online to such sites as Chegg, StuDocu, Course Hero, etc.

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:

Midterms and lab quizzes will be written via WeBWork. Only **one submission per assessment attempt** will be permitted.

Students are expected to complete all midterms and lab quizzes **individually**.

It is the student's responsibility to ensure that they have a **working computer** and a **working, stable internet connection** prior to beginning a midterm or quiz.

In the event that a student cannot write a midterm due to **illness** or due to a **time conflict**, it is the student's responsibility to contact the course coordinator (claudia.mahler@ucalgary.ca) as soon as possible (within 48 hours of the exam in the case of illness; at least 24 hours before the exam in the case of a time conflict) so that a deferred midterm can be arranged.

### **WISE Program Alternative Midterm Assessment**

To provide more flexibility for students and to lessen some of the stress of exams, a WISE Program Alternative Midterm will be available for each of the three midterms. In the event that a student:

- does not write a midterm for reasons **other** than illness or time conflict
- writes a midterm but does not feel satisfied with their performance (note: students will **not** be able to see their score on the original midterm before making the choice to take the alternative midterm)

the student has the option to complete a WISE Program Alternative Midterm. This alternate midterm:

- will open at noon the day after the originally-scheduled midterm and remain open until the following Monday at 11:59 PM
- will have no time limit (that is, it will not have the original midterm's time limit of 75 minutes once opened)
- will replace the grade of the original midterm if a student chose to take the original midterm

**The maximum a student can receive on this alternate midterm is a 75%. That is, a score of "100%" on this alternate midterm translates to a midterm score of 75%.**

If a student wishes to take this alternate midterm, they must fill out the appropriate form **no later than 12:30 PM the day after the scheduled day of the original midterm**.

More details on this program will be provided on D2L.

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.

- 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 their [website](#) or call [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](mailto:svsa@ucalgary.ca)) or phone at [403-220-2208](#). The complete University of Calgary policy on sexual violence can be viewed [here](#).
- 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](#)  
[Faculty of Science Academic Misconduct Process](#)  
[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 (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:** [SU contact](#), Email SU Science Rep: [sciencerep1@su.ucalgary.ca](mailto:sciencerep1@su.ucalgary.ca), [Student Ombudsman](#)

- 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 the population of interest, or the target population. Differentiate between the population and the sample; differentiate between a parameter and a statistic.
- Make the distinction between a quantitative and qualitative variable. Explain the three different properties of any population variable: the distribution shape, the center of the distribution, and the spread of the distribution. Construct various graphical techniques to make conclusions of the shape of the underlying distribution, the different measures of center and dispersion. Compare the concepts of percentiles and quartiles, and what they mean with regards to the population of interest.
- Compute the probabilities of simple and compound events. Give examples of the concepts of mutually exclusive events, independent events, and conditional events. Illustrate how an event can be transformed into a real number through the use of random variables; show that a random variable has a distribution, with a measure of center and a measure of dispersion.
- Compute the expected value, the variance and the standard deviation of a generic discrete and continuous random variable. Compute the expected total and its standard deviation of a linear function of certain random variables.
- Illustrate that certain random events can be described by probability models. Differentiate between the probability models (the Binomial, Poisson, Uniform/Exponential, Hypergeometric and Normal distributions) and apply each to find probabilities. Find a percentile under the Normal distribution. A knowledge of each distribution -shape, measure of center, and measure of dispersion -is also expected.
- Describe the Central Limit and apply to both the sample mean and sample proportion to determine how likely they are to fall within a given range of values
- Take a bivariate data set and (i) determine the strength of a linear relationship between the two variables of interest based on a scatter plot and the correlation coefficient, (ii) build a simple linear regression line and interpret the meaning of the slope and intercept parameter estimates, (iii) outline and check assumptions behind the simple linear model, and (iv) find the coefficient of determination and explain its meaning.
- Construct and interpret the confidence interval for a population mean and a population proportion. Confidence interval estimation of the population mean will emphasize the use of the Student's T-distribution.
- Compute the required sample size for a given confidence level and tolerable amount of sampling error when the statistical investigation involves estimation of either a population mean or a population proportion.
- Execute statistical hypothesis testing for a population mean and a population proportion. This includes (i) set up the statistical null and alternative hypotheses (ii) identify the appropriate version of the test statistic and compute the value of this test statistic, (iii) state the rejection region, calculate the P-value, (iv) tell whether the data supports the null hypothesis or not, and (v) interpret the meaning of the P-value in the context of the data. That is, describe the event that the P-value finds the probability of

Electronically Approved - Sep 01 2022 15:15

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### Department Approval

Electronically Approved - Sep 01 2022 22:28

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**Associate Dean's Approval**