



## COURSE OUTLINE

### 1. **Course:** SCIE 301, Research Design and Statistical Analysis - Winter 2024

Lecture 01 : TR 11:00 - 12:15 in SA 106

Instructor	Email	Phone	Office	Hours
Claudia Mahler	claudia.mahler@ucalgary.ca	403 220-7717	MS 376	Wednesdays 16:00-17:00

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, labs, and quizzes will be delivered in-person.**

**Lectures** will be held in person every Tuesday and Thursday from 11:00 - 12:15.

**Tutorials** will be held in person on most Fridays.

**Quizzes** will be held in person during certain lab times on Fridays.

**Please note that students must attend their registered in-person tutorial sessions to complete the scheduled quizzes!**

#### **Course Site:**

**D2L:** SCIE 301 L01 - (Winter 2024) - Research Design and Statistical Analysis

**WeBWork:** SCIE 301

**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):**

24 units (4.0 full-course equivalents) and admission to the Natural Sciences Program.

### 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
Tutorial Tasks	10%	Ongoing		
Assignment 1	7.5%	Feb 02 2024		
Quiz 1	13.33%	Feb 09 2024		
Assignment 2	7.5%	Mar 01 2024		
Quiz 2	13.33%	Mar 08 2024		
Assignment 3	7.5%	Mar 15 2024		
Assignment 4	7.5%	Mar 28 2024		
Quiz 3	13.34%	Apr 05 2024		
Group/Individual Project	20%	Apr 15 2024		

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%	76%	72 %	68 %	64%	60%	55 %	50 %

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:** Assignment questions will be posted to D2L at least a week before they are due. Assignments will be submitted through D2L's dropbox feature and can either be typed or neatly handwritten for submission. It is the responsibility of the student to ensure that the scans/pictures of the assignments are uploaded correctly.

**Quizzes:** Quizzes will be held **in person** during scheduled lab times on February 9, March 8, and April 5 (tentatively).

**Tutorial Tasks:** Tutorial Tasks are short assessments that will either provide more practice with the previous week's material or will help guide students along the process of completing the individual/group project. These tasks are meant to be completed during in-person scheduled tutorial times but will be designed so that students can complete them asynchronously if desired. Tasks will be available all day on scheduled tutorial days and will be due by the end of the day (11:59 PM). Tasks will be submitted through WeBWork.

**Individual/Group Project:** The project is designed to assess students' abilities to both produce and interpret statistical analyses involving real-life data. Over the course of the semester, students will work towards completing a project that will involve a statistical analysis and interpretation of a dataset of their choosing. Students may work individually or in a group of 2 - 4 people. Further details will be provided as the semester progresses.

**For timed assessments (quizzes), accommodations will be adjusted for SAS students as needed. In addition, accommodations for students with issues with scheduled times/dates (e.g., university-recognized schedule conflicts, caregiving responsibilities) will be applied on a case-by-case basis. Please email 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:

In the event that a student legitimately fails to submit any online or in-person assessment on time (e.g. due to illness, domestic affliction, 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, or possible exemption and reweighing of components. Absences not reported within 48 hours will not be accommodated. Students may be asked to provide supporting documentation ([Section M.1](#)) for an excused absence, See [FAQ](#).

If an excused absence is approved, options for how the missed assessment is dealt with is at the discretion of the coordinator or course instructor. Some options such as an exemption and pro-rating among the components of the course may not be a viable

option based on the design of this course.

### **SCIE 301 Course Policies**

It is the responsibility of the student to clearly communicate with your 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. 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.

In the event that a student cannot write a quiz due to illness or a university-recognized conflict, the weight of the missed quiz will be shifted to the other two quizzes (e.g., if a student is ill for Quiz 2, the weight of Quiz 2 will be distributed equally amongst Quiz 1 and Quiz 3). **If a student misses two or more quizzes due to illness or a university-recognized conflict, it is the student's responsibility to contact the course instructor as soon as possible to discuss alternative means of assessment.**

If an excused absence and a resulting accommodation is not provided, **assignments submitted past the posted due dates will be docked 10% for each day that they are late.** If an excused absence and a resulting accommodation is not provided, **missed Tutorial Tasks and Quizzes will be graded as a 0%.**

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

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

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

**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/>.

**RStudio:** RStudio is an integrated development environment (IDE) for R. It allows you to run R but displays it in a slightly different way than R looks by default. RStudio is free and can be downloaded at: <https://www.rstudio.com>

**Online R Textbook:** Learning Statistics with R (Daniel Navarro). This textbook can be accessed at the following link: <http://www.fon.hum.uva.nl/paul/lot2015/Navarro2014.pdf>

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 Winter 2024 SCIE 301 course.** This includes (but is not limited to) distributing course notes, videos, practice problems, and quiz 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:**

Unless otherwise stated, quizzes are to be considered "closed book." Students will be allowed to use R/RStudio, a non-programmable calculator, and any provided formula sheets/tables.

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 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. **Student Ombuds Office:** A safe place for all students of the University of Calgary to discuss student related issues, interpersonal conflict, academic and non-academic concerns, and many other problems.

e. **Student Union Information:** [SU contact](#), Email your SU Science Reps: [science1@su.ucalgary.ca](mailto:science1@su.ucalgary.ca), [science2@su.ucalgary.ca](mailto:science2@su.ucalgary.ca), [science3@su.ucalgary.ca](mailto:science3@su.ucalgary.ca).

### f. 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 Dr. Nicole Sandblom by email [ntscdirector@ucalgary.ca](mailto:ntscdirector@ucalgary.ca) preferably 10 business days before the due date of an assessment or scheduled absence.

g. **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](#)

- h. **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. **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.
- j. **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.

#### Course Outcomes:

- Identify an area of research, formulate the scientific research questions and design appropriate and feasible research procedures for investigation
- Compare and contrast different research methods and sampling techniques, select the optimal approach for specific research question and provide power calculation to decide the sample size
- Select methods of measurement based on the sources and guide data collection and organization to accurately address the research question
- Develop skills using the statistical software R to manage, prepare and summarize the data using descriptive statistics and graphs
- Construct hypotheses based on the research questions, test them using statistical inferences and software given the samples, draw valid conclusions and interpret the results
- Publicize research procedures and findings in reports, presentations, posters or papers to support programs to decision makers and other clients
- Understand and critically evaluate your own findings and other scientific papers by the commonly used research designs and statistical techniques in natural sciences

Electronically Approved - Jan 05 2024 14:13

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**Department Approval**