STAT 450

Case Studies in Statistics

Course Information Extra Resources

Syllabus

Winter Session 2025/26 Term 2

Time and Place

- Lectures: Check Workday for current schedule and location.
- Labs: Check Workday for current schedule and location.

Course Description

This course provides the basic statistical toolkit required for the understanding and use of a range of methods for both summarizing and analyzing data, giving a platform for further study of applied Statistics. The emphasis in the course will be the application of these methods to real-life situations from Science.

Course Objective

To train students to apply their statistical knowledge to applied research problems, to develop skills of working with non-statisticians either as a consultant or as a collaborator, and to communicate effectively, both orally and in writing, with statisticians and non-statisticians.

Most course activities will be organized around a series of case studies based on recent and current applied research problems from different subject areas. Students will participate in:

- formulation of statistical approaches to these applied research problems,
- written and oral presentations of proposed statistical approaches,
- data exploration, model building and statistical inference,
- written and oral presentations of results of analyses,
- critical and interactive discussion of all aspects of the case study.
- Methodological topics that arise in the case studies will be discussed as necessary.

Students will work individually and in groups in different class activities and assignments. Throughout the term, students will work in groups on real case studies. Each team will be supervised and supported by the teaching team. Each student will make oral presentations of their team's work throughout the term, and the teams will submit written reports of their work. The grand finale is a semi-public poster session at the end of the semester. Note: each team will need to split the costs of poster printing.

Prerequisites

STAT 306. Restricted to 4th year Statistics majors.

Contact

Position	Name
Instructor	Grace Tompkins
Instructor	Bruce Dunham
Instructor	Payman Nickchi
Instructor	Rodolfo Lourenzutti
Writing Instructor	Estella Qi
Teaching Assistant	Gian Carlo Di-Luvi

Please contact the instructors at stat450@stat.ubc.ca if you have personal or administrative questions that do not pertain to the course material (e.g., Centre for Accessibility registration, medical issues, mental health, special requests, etc).

Please use the STAT450 SLACK channel for communications related to:

- Technical issues (problem installing something, finding something);
- Questions related to the topics of the course;

Please note: The teaching team responds to emails Monday to Friday, and we try our best to answer you as promptly as possible. Please be patient if you don't get a response immediately!

Course Platforms

- **Canvas**: All course deliverables and information can be found on the course's page on Canvas. Please check the Canvas website regularly to keep up-to-date with the course.
- **Slack**: Slack is a chat platform better for real-time messaging. We hope Slack can facilitate the interaction between group members. We have created a Workspace for STAT 450. You will first need to join using the invitation link posted on Canvas.
- **GitHub**: You will carry out assignments and group work using GitHub for code development and version control.

Course Structure

Labs

- Labs will start in the first week of class.
- We will use RStudio in this course.
- You must attend the lab section. It is a crucial component of this course.

Textbook

Available for free in LeanPub (Links to an external site) under a sliding payment scale method. If you click the "Book" option you, you can get an electronic copy for free or you can pay what you can and/or want for the textbook.

You can also get if for free here, but it appears the learnpub version is more recent.

Course Assessment

Table 1: Course

Deliverable	Weight
Homeworks	5%
Lecture Attendance	5%
Labs	10%
Group project (see table 2 for breakdown)	80%

Table 2: Group Project

Deliverable	Weight
Team Work Contract	5%
Group Proposal	5%
Client Interaction	10%
Group Written 1st Report	10%
Individual In-Class Questions about Project	5%
Midterm Peer Assessment on Group Work	2.5%
Group Written 2nd Draft	10%
Group Final Report	10%
Group Oral Presentation	10%
Group Poster Session	10%
Final Peer Assessment on Group Work	2.5%

- For the due dates and details of the assignments, refer to Canvas.

Course Policies

Academic Concession

Please see Canvas for course deadlines. Any submission or modification after the due date will not be graded unless you have requested an extension. If you anticipate having trouble meeting a deadline and need an academic concession, please reach out in advance via email to the instructors. Here is a template you can use for a self-declaration.

If you miss class, we suggest you to:

- Consult the class resources on Canvas
- Use the class Slack workspace to discuss missed material with classmates
- Visit office hours
- Seek academic concessions, if applicable

Academic Integrity

All students are expected to follow UBC's Academic Honesty and Standards policy. In this course:

- We encourage students to work together on assignments and labs, however all of your work must be written in your own words. Visit the Learning Commons' guide to academic integrity for support in understanding how to prevent unintentional plagiarism.
- Students must correctly cite references if you quote or use outside sources in your work, *including any generative AI tools* (see next section).

Use of generative artificial intelligence (AI) tools

If you choose to use generative AI tools to complete coursework, *you must disclose your use of them*. This disclosure must be included at the top of the submission file for the assignment in which the generative AI tool was used. The disclosure should include the name of the tool and a brief description of how it was used.

Further, if you choose to use generative AI tools for coursework, you should be aware of the following:

- Privacy implications: Information you input into some tools, along with some device data such as your IP address, may be sent to servers outside of Canada, which may put you or your client's intellectual property, sensitive study data, and/or personal information at risk. For this reason, **client data or specific details of the client's study may not be shared with generative AI tools**. For more information, please refer to UBC's Privacy Impact Assessment for generative AI tools.
- False or misleading information: Generative AI tools can produce biased, false or misleading content, because of the nature of the training datasets. They are designed to produce the most statistically plausible text result, not necessarily the correct one, and they cannot take responsibility for what they produce. You, on the other hand, must take responsibility for the

> accuracy and integrity of your written work: therefore, you should not consider the output of a generative AI tool to be reliable unless verified by information in scholarly sources, and the information included in your assignments must be found in and attributed to scholarly sources.

What happens when academic integrity is breached?

Breach of this academic integrity policy may, at a minimum, result in a grade of 0 on the relevant assessment or may result in more serious consequences. Please see UBC's Academic Calendar for detailed policies on Academic Misconduct. At any time: if you are unsure if a certain type of assistance is authorized, please ask us.

Health and Safety

Please follow the current UBC COVID-19 Campus Rules regarding self-monitoring, and staying home if you are sick. Although masks are no longer required on campus, please respect the choices of your fellow students and the instructional team who may continue to wear masks.

We, the instructors, will do our best to stay well, but if we are ill, we will not come to class. If that happens, here's what you can expect:

- Another instructor will substitute.
- Class may take place over Zoom (in this case, Zoom link will be posted on Canvas).

Extreme Environmental Conditions Contingency Plan

In-person, on campus activities may need to be cancelled due to issues such as weather conditions (e.g., snow). The most up-to-date information about cancellations will be posted on ubc.ca. Please check ubc.ca often during times when an extreme weather event could disrupt our course activities. Here is what you can expect in the event an in-person lecture or lab session is cancelled:

Depending on the nature of the planned in-class activities, class may take place over Zoom (in this case, Zoom link will be posted on Canvas), or an alternate activity may be posted on Canvas for you to complete before the next scheduled class. We will communicate over Slack to announce the specifics for each case that arises as soon as we can.

Privacy

This course requires students to work and communicate on github.com and Slack. Please be advised that the material and information you put on GitHub and Slack will be stored on servers outside of Canada. Data used for these tools may not be protected, as

they have not gone through a Privacy Impact Assessment (PIA) and been identified as FIPPA compliant. When you access GitHub or Slack, you will be required to create an account. While both tools have a privacy policy (GitHub privacy policy, Slack privacy policy), UBC cannot guarantee security of your private details on servers outside of Canada. Please exercise caution whenever providing personal information. You may wish to use a pseudonym to protect your privacy if you have concerns. If you choose to do so, you will need to inform the instructional team of your alias. Please feel free to contact UBC (access.and.privacy@ubc.ca) or the support team for GitHub or Slack if you have any questions.

Use of class time

Discussions during our scheduled class time are intended to relate to the learning outcomes for the course.