STAT461/561 - Statistical Inference II

University of British Columbia - Winter 2023/2024 - Term 2

Instructor

Jiahua Chen. Contact information and office hours will be made available on Canvas.

Disclaimer

Some additional adjustments on course material, evaluations, etc., will be made after the start of term. A final version will be posted on Canvas and regarded as official.

Course Description

Detailed development of the theory of inference (testing of hypotheses, confidence regions), Bayesian models and inference. Additional topics selected from: Bootstrap, Empirical likelihood, Mixture model, Hidden Markov Models, Model selection, and False discovery rate.

Prerequisites

STAT 460 or STAT 560, or direct approval of the instructor.

Audience

Undergraduates honour students in statistics and graduate students.

Textbook

Lecture notes prepared by the instructor will be posted on Canvas. Much of the material in the notes is taken from the following books. Electronic access to these books is mostly likely available via the university library.

- Shao, J. Mathematical Statistics. (2003). Second edition. Springer texts in Statistics. `https://go.exlibris.link/cP0nxFWt`
- Bickel, PJ and Docksum, KA. (2015, 2016). Mathematical Statistics: Basic ideas and selected topics. 2nd edition, volumes 1 and 2. Taylor and Francis.
- Lehmann, E.L. and Romano, J.P. (2010). Testing Statistical Hypotheses. Springer texts in Statistics. `https://go.exlibris.link/jFYHdYF4`

Syllabus

See the table of contents of the lecture notes. The lectures will be delivered by handwriting on the whiteboard.

Course Evaluation

Assignments (30%): There will be 5 hand-in assignments and no midterms. The marks may not spread over assignments evenly. I will experiment with the strict rule of giving out partial marks. Poorly presented assignment hand-ins will not be graded but returned to be re-worked with brief comments without penalty in the first round.

Peer evaluation (30%): Search for a technical problem of appropriate depth, work out a well-organized solution and present it to your classmates and myself. Each classmate will give a mark between 0 and 10. The mean after removing the highest and lowest mark will be the final mark.

Final Exam (30%): The Final Exam will include all materials covered in the course.

Bonus for participation (10%): Given based on various levels of course-related activities during, after lectures, or within department gatherings.

Policy regarding late/missing assignments, exams and final grade

- Try your best to beat the deadline of each assignment. Sometimes, the content of the assignment can be ahead of lectures. Being honour and graduate students, you are encouraged or even required to act ahead of my lectures. You will always be allowed to re-work and hand-in a week later. This deadline is hard: a 2% deduction will be applied for being late for each day.

- Check the university website for policies regarding missing the final exam. We will accommodate all excuses.

- UBC policies for Academic concessions: `https://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,329,0,0`

- UBC policies related to exam issues: `https://science.ubc.ca/students/advising/exams`

- Student self-declaration of academic concession: `https://stat545.stat.ubc.ca/concession_template.pdf`

- UBC policy with regards to Academic Misconduct: `https://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,54,111,0`

We acknowledge that UBC Vancouver is located on the traditional, ancestral, and unceded territory of the Musqueam people is an important way to remind learners that UBC and the people who study, work, live, and play within the institution have responsibilities that emerge from past and ongoing relationships with Indigenous host nations.