STAT 461/561 — Statistical Inference II

University of British Columbia — Winter 2025/2026 — Term 2

Instructor
Jiahua Chen. Contact information and office hours will be posted on Canvas.

Duration
The first day of class is January 5, 2026. The last day of class is April 10, 2026.

Course Description
Detailed development of the theory of inference (hypothesis testing, confidence regions), Bayesian models and inference. Additional topics selected from: Bootstrap, Empirical Likelihood, Model Selection, and False Discovery Rate.

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

Audience
Undergraduate Honours 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 drawn from the following books. Electronic access to these books is likely available through the university library.

- Shao, J. *Mathematical Statistics* (2003), 2nd edition. Springer Texts in Statistics. `https://go.exlibris.link/cPOnxFWt`

- Bickel, P.J. and Doksum, K.A. (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. Lectures will be delivered by handwriting on the whiteboard. There will be no Zoom arrangement.

Course Evaluation

Assignments (60%): There will be 5 hand-in assignments and no midterm.

Assignment problems will be posted weekly and grouped into five sets. The due dates will be: Jan 30, Feb 13, Feb 27, Mar 13, and Mar 27.

Assignments will be marked based on correctness, completeness, and comprehension. They will be annotated as much as possible, and annotation will stop once a solution goes significantly off track. Given the advanced level of the course, a rigid marking scheme is unrealistic. Instead, grading will follow general principles and an overall assessment of the quality of the submission.

STAT 461 students will work on the same problems as STAT 561 students, but the marking expectations will be less stringent regarding precision and technical details.

Given the small class size, we may discuss directly whether any assignment component is too demanding and how to address the issue. Depending on the situation, requirements may be adjusted or additional help may be provided.

Discussion among students is encouraged, provided that each student submits their own independently written solutions. The ultimate goal of teaching and learning is to acquire knowledge, build technical proficiency, and strengthen presentation skills.

Final Exam (30%): The final exam will be based on the assignment problems.

Participation (10%): Assessed based on various course-related activities during and after lectures. This component encourages attendance and discourages habitual lateness.

Policy on Late/Missing Assignments, Exams, and Final Grades

- Consult the university website for policies regarding missed final exams. All legitimate excuses will be accommodated.

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

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