

# STAT 522B Asymptotic theory

## University of British Columbia - Winter 2024/2025 - Term 1

### Instructor

Jiahua Chen.

### Course Description

A number of classical large sample theorems will be presented.

### Prerequisites and Audience

A solid understanding of probability theory at the MSc level, or for those willing to challenge themselves.

### Textbook

A course note by the instructor will be posted on Canvas.

### Syllabus

A selective number of classical approximation theorems from the notes will be presented. Flexibility is key this time. Below is a list of the intended theorems

1. Classical central limit theorem including a few varieties.
2. Slutsky's theorem together with notion of stochastic orders and delta method.
3. Limiting distribution of sample median and related results
4. Limiting distribution of MLE and LRT under regular models.
5. Some results under simple yet non-regular finite mixture models.

### Course Evaluation

We do not expect students to independently tackle asymptotic problems immediately after completing this course, especially in a closed-book exam setting. It is also unrealistic to expect each of you to develop a meaningful course project at this stage.

Instead, evaluation will be based on four criteria: (1) attendance, (2) in-class participation, (3) after-class discussions, and (4) the submission of one or two self-selected, non-trivial end-of-chapter problems. Alternatively, creating your own problem along with a solution would also be a good approach.

A reasonable and somewhat subjective grade will be assigned based on my overall impression of your performance in these areas.

## Acknowledgment

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.