Course Information

STAT 528: Applied Statistics Capstone

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About the Course

Course Overview

Covers technical and non-technical aspects of applied statistics work, building on methods taught in prerequisite courses. Key elements include: study design, determining the aim of the analysis, choosing an appropriate method, and report writing.

Prerequisites

STAT 502; STAT 504; STAT 536; STAT 570
The overarching goal of this course is to fill in some of the methodological gaps, concentrating on those topics and methods that are important for applied work. Topics include:

- Data analysis and reporting
- Graphics and descriptive statistics
- P-values, Bayes factors, sample size, and power calculations
- Scientific and technical writing
- Principal components analysis
- Latent variable modeling and factor analysis, Rasch model, and Item Response Theory
- Multiple testing
- Survey sampling
- Missing data in longitudinal studies
- Causality

Required Texts

There is no required text for this course. Some but not all lectures will have assigned readings. Please see "to read and view" pages under Modules.

(Logistics

The best way to keep up with the class is via Canvas Modules. Course lectures will be done synchronously either online (on Zoom) or in person. We will start with the online format. A preliminary schedule for meetings format (online versus in person) is posted on Canvas and is subject to change. Please check on the course format beforehand.

Communication with the class will be done via Canvas Announcements. Please make sure you signed up for Canvas announcement notifications.

Academic Integrity

You are welcome to work on homework assignments with each other in small groups, however, each student is required to submit their own solution, code, and write-up.

Grading

- Homework assignments (65%),
- Graded online discussions (15%)
- Take-home final (20%)
Late assignments or discussions received within 1 week of their original due date will be given 50% of their earned score. After 1 week, assignments and discussions will not be given credit.

Course Timeline

- M Jan 03: Introduction
- W Jan 05: Data analysis and reporting
- M Jan 10: Graphics and descriptive statistics I
- W Jan 12: Graphics and descriptive statistics II
- M Jan 17: No class - Holiday
- W Jan 19: P-values, Bayes factors, sampling size, and power calculations
- M Jan 25: Scientific and technical writing
- W Jan 26: PCA
- M Jan 31: Latent variable modeling and factor analysis I
- W Feb 02: Latent variable modeling and factor analysis II
- M Feb 07: Factor analysis for binary variables, Rasch model, IRT
- W Feb 09: Multiple testing
- M Feb 14: Design-based inference and simple random sampling
- W Feb 16: Stratified, cluster, multistage sampling, and poststratification
- M Feb 21: No Class - Holiday
- W Feb 23: Nonprobability sampling
- M Feb 28: Missing data in longitudinal setting
- W Mar 02: Missing data in longitudinal setting
- M Mar 07: Causality
- W Mar 09: Causality

Syllabus Resources

Access and Accommodations

Your experience in this class is important to me. If you have already established accommodations with Disability Resources for Students (DRS) (https://depts.washington.edu/uwdrs/), please communicate your approved accommodations to me at your earliest convenience so we can discuss your needs in this course.

If you have not yet established services through DRS, but have a temporary health condition or permanent disability that requires accommodations (conditions include but not limited to; mental health, attention-related, learning, vision, hearing, physical or health impacts), you are welcome to
accommodations are established through an interactive process between you, your instructor(s) and DRS. It is the policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law.

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Religious Accommodations

Washington state law requires that UW develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The UW’s policy, including more information about how to request an accommodation, is available at [Religious Accommodations Policy](https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/). Accommodations must be requested within the first two weeks of this course using the [Religious Accommodations Request form](https://registrar.washington.edu/students/religious-accommodations-request/).

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Notice to Students - Use of Plagiarism Detection Software

**Notice:** The University has a license agreement with SimCheck, an educational tool that helps prevent or identify plagiarism from Internet resources. Your instructor may use the service in this class by requiring that assignments are submitted electronically to be checked by SimCheck. The SimCheck Report will indicate the amount of original text in your work and whether all material that you quoted, paraphrased, summarized, or used from another source is appropriately referenced.