Syllabus

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

Learning Goals

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 may include:

- Data analysis and reporting
• Graphics
• Scientific and technical writing
• P-values, sample size and power
• Principal components analysis
• Factor analysis and latent variable models
• Multiple testing
• Survey sampling
• Missing data
• Causality
• Measurement error
• Issues of ethics

Required Texts

There is no required text for this course. Some but not all lectures will have assigned readings and lecture videos will be available for viewing in advance. Please see "to read and view" pages under Modules. (https://canvas.uw.edu/courses/1436202/modules)

Logistics: Learning Remotely

The course will be taught on-line following a flipped classroom model. Lecture videos will be posted in advance. Videos for each upcoming week will be available by Monday morning or earlier if time allows. Most of the time, there will be two videos for two lectures each week. Please allow about one hour for viewing each lecture. Links to videos will be posted under modules.

Class time will be used as follows

• Monday 3:30-4:20 Q&A session (office hours style)
• Wednesday 3:30-4:20 Synchronous class session (guided practice and discussion in small groups)

It is assumed that students come to Wednesday's session having worked through the lecture videos, however, it is best to attend than not to attend. Shorter class sessions account for time spent working through lecture videos. Wednesday's synchronous class sessions will be recorded and posted online; these recordings will be available throughout the quarter.

The best way to keep up with the class is via Canvas Modules. A preliminary course timeline can be found below, however, changes to this preliminary timeline will only be reflected in Canvas Modules. Please check the Canvas Modules (https://canvas.uw.edu/courses/1436202/modules) pages regularly for assignments and reading/viewing materials. The instructors and the TA will post all materials on Canvas.

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

Academic Integrity
While you are welcome to work on homework assignments with each other in small groups, 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%)

Course assessments will include graded discussions, homework assignments and take-home final. There will be approximately five written homework assignments and three graded discussions. All graded assignments will be due at 11:59pm Seattle time. If you are in a different time zone, please contact instructors and we may be able to adjust your due time by a few hours.

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 (preliminary and subject to change)

- M Jan 04: Introduction
- W Jan 06: Data analysis and reporting
- M Jan 11: Graphics and descriptive statistics
- W Jan 13: Scientific and technical writing
- M Jan 18: No class - Holiday
- W Jan 20: P-values, Bayes factors, sample size, and power calculations
- M Jan 25: PCA, latent variable modeling, and factor analysis
- W Jan 27: PCA, latent variable modeling, and factor analysis
- M Feb 01: Factor analysis for binary variables, Rasch model, IRT
- W Feb 03: Factor analysis for binary variables, Rasch model, IRT
- M Feb 08: Multiple testing
- W Feb 10: Multiple testing
- M Feb 15: No class - Holiday
- W Feb 17: Design-based inference and simple random sampling
- M Feb 22: Stratified, cluster, and multistage sampling
- W Feb 24: Nonprobability sampling
- M Mar 01: Missing data
- W Mar 03: Missing data
- M Mar 08: Causality, ethics, measurement error
- W Mar 10: Causality, ethics, measurement error

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 contact DRS at 206-543-8924 or uwdrs@uw.edu (mailto:uwdrs@uw.edu) or disability.uw.edu. (http://depts.washington.edu/uwdrs/) DRS offers resources and coordinates reasonable accommodations for students with disabilities and/or temporary health conditions. Reasonable 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.

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).

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.