

Keck School of Medicine of USC

PM 516A/B: Statistical Problem Solving

Units: 1
Term: Summer 2022
Location: ONLINE
Monday 3:30-4:20pm (516A)
Monday 4:30-5:20pm (516B)
Instructor: Trevor A. Pickering (tpickeri@usc.edu)

Office hour times and locations will be posted on Blackboard.

Course Overview

Course Description

This course will help statisticians and data analysts develop the necessary skills for successfully interacting with non-statistician collaborators. We will primarily be working with an investigator to determine the research question and scope, formulate and implement our analyses, and convey our findings. Therefore, the main goals of the course are 1) developing qualities necessary for an effective statistical consultant and 2) working with an investigator on an actual analysis problem.

Learning Objectives

Through this course, students will become familiar with the process of statistical consulting.

Students will learn:

- The importance of statistical consulting and its usefulness in the public health environment
- How to improve their understanding of an unfamiliar topic and translate researchers' questions into a statistically testable set of hypotheses
- To choose the best statistical approach for answering a collaborator's questions
- Ways of communicating effectively by clearly explaining statistical concepts
- To understand ethical considerations for statisticians
- To appropriately analyze and interpret analyses for dissemination materials, such as brief reports or results sections of manuscripts

Course Preparation

Prerequisites PM510 or equivalent course. PM516a & b may be taken concurrently.
Recommended Preparation The course assumes a familiarity with basic statistics and regression analysis

Course Requirements

Communication

Blackboard (slides, data sets, assignment submission), USC e-mail (communication)

Required Materials

There is no required textbook. Weekly reading materials will be assigned through Blackboard. Students must have proficiency in at least one statistical program, but may choose which use for this course (e.g., R, SAS, Stata, SPSS)

Assessments

Grading Breakdown

Category	Points
Weekly Activities	10ea x 8
Final Project	20
Total	100

Each week's assignment will contain a variety of activities (see below).

Late Submission Policy

As many of the assignments pertain to preparation for in-class activities, late assignments are not accepted. However there may be opportunities to make-up assignments in rare circumstances.

Description of Assessments

In-Class Activities	Weekly in-class activities will focus on developing skills for statistical consultations (e.g., client-consultation role-playing, group discussion, interacting with an investigator, presenting results, etc.). There will be a worksheet each week to accompany these activities.
Take-Home Activities	Weekly take-home activities will include readings, reflections, and data analysis for the project.
Participation	Class sessions will cover a variety of material, such as practice consultations and other skills development, and students must be present for this content.
Final Project	The last week's activity will be a final presentation and/or analysis report to address the researcher's question from the consultation.

Course Schedule

A	Topic	Readings	Worksheet
Week 1 M 5/23	Active Listening Communication Activity	Relationships & Interactions Tips That'll Make Others Open Up To You When You Consult A Statistician	Self-Assessment Data Quality Control
Week 2* M 5/30	Exploratory Analysis	The PICOT Format	PICOT Reflection
Week 3 M 6/6	Practice Consultations	Choosing the Right Statistical Test	Intake Form Review
Week 4 M 6/13	Investigator Meeting Consultation Debriefing		Exploratory Analysis
Week 5 M 6/20	Project Review EDA Review	Rudiments of Numeracy How to Graph Badly	Tables & Figures
Week 6* M 6/27	Tables & Figures		
Week 7* M 7/4	Critical Consult Review		
Week 8 M 7/11	Project Check-In	The ADEPT Method	Statistical Analogies
Week 9 M 7/18	Communicating Results ADEPT Exercise		
Week 10 M 7/25	Final Presentation		

**There will be no live session on weeks marked with a **

B	Topic	Readings	Worksheet
Week 1 M 5/23	The Practice of Statistical Consulting	Statistical Consulting Clients Reproducible Analysis	Quick Consult
Week 2* M 5/30	Reproducibility	Data Science's Reproducibility Crisis Style Guides	Reproducibility
Week 3 M 6/6	Practice Consultations	Choosing the Right Statistical Test	Intake Form Review
Week 4 M 6/13	Investigator Meeting Consultation Debriefing		Exploratory Analysis
Week 5 M 6/20	Project Review Reproducibility Review	Personality Types	Personality Test
Week 6* M 6/27	Personality Types	STROBE & CONSORT Checklists Ways to Improve Your Style in Writing	Statistical Writing
Week 7* M 7/4	Statistical Writing	Statistical Mistakes to Avoid	Statistical Mistakes
Week 8 M 7/11	Project Check-In Data Quality Review	Chocolate Is Good The Potti Case Ethical Guidelines for Statistical Practice	Ethics Reflections
Week 9 M 7/18	Ethics Case Studies		
Week 10 M 7/25	Final Presentation		

**There will be no live session on weeks marked with a **

Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, “Behavior Violating University Standards” <https://policy.usc.edu/scampus-part-b/>. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Support Systems:

Student Counseling Services (SCS) - (213) 740-7711 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. <https://engemannshc.usc.edu/counseling/>

National Suicide Prevention Lifeline - 1-800-273-8255

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. <http://www.suicidepreventionlifeline.org>

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-4900 - 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. <https://engemannshc.usc.edu/rsvp/>

Sexual Assault Resource Center

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: <http://sarc.usc.edu/>

Office of Equity and Diversity (OED)/Title IX compliance – (213) 740-5086

Works with faculty, staff, visitors, applicants, and students around issues of protected class. <https://equity.usc.edu/>

Bias Assessment Response and Support

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. <https://studentaffairs.usc.edu/bias-assessment-response-support/>

The Office of Disability Services and Programs

Provides certification for students with disabilities and helps arrange relevant accommodations. <http://dsp.usc.edu>

Student Support and Advocacy – (213) 821-4710

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. <https://studentaffairs.usc.edu/ssa/>

Diversity at USC

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. <https://diversity.usc.edu/>

USC Emergency Information

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible, <http://emergency.usc.edu>

USC Department of Public Safety – 213-740-4321 (UPC) and 323-442-1000 (HSC) for 24-hour emergency assistance or to report a crime

Provides overall safety to USC community. <http://dps.usc.edu>