

Keck School of Medicine of USC

PM 516a: Introduction to Biostatistical Consulting

Units: 1
Term: Fall 2024
Location: Online, Mondays 5:00-5:50pm
Instructor: Trevor A. Pickering (tpickeri@usc.edu)

Office hour times and locations will be posted on Blackboard.

Course Overview

Course Description

This course serves as an introduction to biostatistical consulting. It will help statisticians and data analysts develop the necessary skills for successfully interacting with non-statistician collaborators. We will focus on two main goals: 1) developing the qualities necessary for an effective statistical consultant and 2) working with an investigator on an actual analysis problem (determining research questions and scope, formulating and implementing our analysis, and conveying our findings).

Learning Objectives

Through this course, students will become familiar with the process of statistical consulting. Students will learn to:

- Understand the importance of statistical consulting and its usefulness in the public health environment
- Apply techniques to improve their understanding of an unfamiliar topic and translate researchers' questions into a statistically testable set of hypotheses
- Evaluate the best statistical approaches to address collaborator's questions and apply such techniques
- Apply effective communication by clearly explaining statistical concepts
- Understand ethical considerations faced by statisticians
- Create analyses and results for dissemination to the client and other stakeholders

Course Preparation

Prerequisites PM510 or equivalent course.

Recommended Preparation The course assumes a familiarity with basic statistics and regression analysis through the level of PM511a. However, students will be matched with projects commensurate with their level of statistical skill.

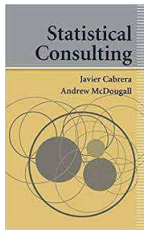
Course Requirements

Communication

Brightspace (slides, data sets, assignment submission), USC e-mail (formal communication), Slack (informal communication)

Required Textbook

Note: Textbook may be available through the USC Libraries (libraries.usc.edu)



Cabrera J, McDougall A. Statistical consulting. Springer Science & Business Media; 2002 Jan 2.

Required Software

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

There are three broad categories of activities for this course:

- Skills development for consultants, which will prepare the student to interact with a client and improve the quality of their consultations.
- Skills development for presenting statistical results, which will improve the effectiveness of the statistician with being able to communicate results to their client.
- Participation in a real consultation as a group with an investigator client at USC.

The course is graded credit/no credit and there is no point breakdown. Instead, students must successfully complete all the following:

Weekly Activities

Students will participate in weekly activities to improve their consulting and statistical analysis skills. To get the most of these activities, students must complete required pre-class preparation, which may include reading articles, excerpts from the textbook, or watching videos. Students will use the information from these pre-class preparation activities in the live session, and will receive credit if they actively participate in at least 10 sessions. Partial credit will be given if the student attends but does not actively participate in a live class session.

Investigator Meeting

Students will be meeting with a collaborator at USC (e.g., from Keck School of Medicine, Children's Hospital Los Angeles, etc.) and will work on a project as a group. Any meeting with the investigator is mandatory. Because this course teaches skills applicable in a consulting setting, students must be on time for the meeting and must be an alert, active participant with their camera on.

Final Presentation

The final day of class will be a presentation to the client collaborator. Students will present in groups, and each student must contribute to the presentation. At the end of the meeting, there will be a brief period for the students and client to provide feedback on the experience.

Late Submission Policy

Assignments cannot be completed outside the in-class context. However, there may be opportunities for alternate make-up assignments in rare circumstances.

Alignment Grid

Learning Objective By the end of this course, students are expected to be able to:	Learning Activities The learning objective will be facilitated by:	Assignment/Assessment This learning objective skill is measured by:
Understand the importance of statistical consulting and its usefulness in the public health environment	Weekly activities emphasizing statistical consulting in public health	Weekly activity assessments and in-class discussion
Apply techniques to improve their understanding of an unfamiliar topic and translate researchers' questions into a statistically testable set of hypotheses	Weekly activities emphasizing translating research questions into statistical analyses	Weekly activity assessments
Evaluate the best statistical approaches to address collaborator's questions and apply such techniques	Weekly activities covering choosing the correct analytical method	Weekly activity assessments and group meetings
Apply effective communication by clearly explaining statistical concepts	Weekly activities outlining ways to communicate statistical concepts, investigator meetings	Weekly activity assessments, group meetings, and final presentation
Understand ethical considerations for statisticians	Weekly activities describing ethical considerations and scenarios	Weekly activity assessments and in-class discussion
Create analyses and results for dissemination to the client and other stakeholders	Weekly activities and meetings regarding the final project	Weekly activity assessments and final project

Course Schedule

	Topic	Before Class	In Class
Week 1 M 8/26	Communication	Relationships & Interactions Active Listening Tips That'll Make Others Open Up To You Textbook 2.1, 2.2	Communication Activity
No Class M 9/2	Labor Day		
Week 2 M 9/9	The Practice of Statistical Consulting	What to Ask in A Consultation	Training Videos Discussion
Week 3 M 9/16	Exploratory Analysis	Data Quality Control Exercise	EDA Review
Week 4 M 9/23	Practice Consultations	The PICOT Format Textbook 4.1-4.4	Practice Consultations
Week 5 M 9/30	Investigator Meeting	Intake Form	Investigator Meeting
Week 6 M 10/7	Statistical Mistakes	Ten Common Statistical Mistakes Guideline for Reporting Results	Statistical Mistakes Exercise
Week 7 M 10/14	Communicating Statistical Concepts	The ADEPT Method 25 Analogies for Statistical Concepts Communicating Statistics to Non statisticians	Statistical Analogies Exercise
Week 8 M 10/21	Check-In I	Exploratory Data Analysis Choosing the Right Statistical Test	Workshop
Week 9 M 10/28	Practice Consultations II	Myers-Briggs Personality Test How Each Personality Type Communicates	Practice Consultations
Week 10 M 11/4	Presenting Statistical Information	How to Graph Badly Rudiments of Numeracy	Graphs and Tables Exercise (MDM)
Week 11 M 11/11	The Statistician's Role	STROBE and CONSORT	Communicating Results Video
Week 12 M 11/18	Check-In II	Statistical Consulting Clients What to Expect When You Consult	Consulting Videos
Week 13 M 11/25	Ethics	The Potti Case Chocolate Is Good	Ethics Discussion
Week 14 M 12/2	Final Presentation		Presentation and Debriefing

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>