

Keck School of Medicine of USC

PM 516b: The Practice of Biostatistical Consulting

Units: 1
Term: Spring 2024
Location: Online, Students will set their own consulting schedule and meetings
Instructor: Trevor A. Pickering (tpickeri@usc.edu)

Office hour times and locations will be posted on Blackboard.

Course Overview

Course Description

This course is the second in the Biostatistical Consulting sequence and will expose students to the practice of biostatistical consulting. It will help statisticians and data analysts practice the necessary skills for successfully interacting with non-statistician collaborators. Under faculty supervision, the student will meet with an investigator and independently conduct statistical analysis throughout the semester.

Learning Objectives

Through this course, students will gain additional experience in statistical consulting. Students will:

- Recall and apply the consulting principles learned in PM516a.
- Summarize research questions and implement appropriate biostatistical methods to address such questions, understanding how different methodologies affect conclusions.
- Apply statistical tools they have learned in their program to produce a meaningful analysis.
- Evaluate statistical interactions with non-statistician collaborators to improve the quality of such interactions.
- Understand how to work with individuals from diverse content domains.
- Create comprehensive, coherent consulting reports and interpret analyses for dissemination materials, such as the results sections of a manuscript.

Course Preparation

Prerequisites	PM516a
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 Textbook

There is no required textbook. Readings will be assigned as needed.

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

Students will each be assigned a project and use the semester to perform statistical analyses and create an analysis report for the client/collaborator. As a 1-unit course, students are expected to spend approximately 25 hours on the analysis and writing of the project. All work should be completed before the last day of class.

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

Required Trainings

Students will be working with real data from investigators at USC and must complete the appropriate required trainings. There are two trainings offered by CITI (<https://about.citiprogram.org/>) that must be completed by the third week of class:

- CITI Biomedical Human Subjects
- CITI Research HIPAA
- Students may need to complete additional project-specific trainings

Required Meetings with Deliverables

This is a collaborative practicum-type course and students will learn additional skills partially through their interactions with the instructor and collaborator. Students must proactively schedule at least 4 meetings over the semester:

- Initial Meeting. Once the project is assigned, the student will schedule a meeting with the collaborator (and instructor, if possible). Deliverable: Send the collaborator and instructor a *consultation follow-up e-mail* that discusses the scope of work and appropriate timelines for the project.
- Interim Meetings. Meetings should be scheduled on an as-needed basis with the instructor and/or collaborator to discuss statistical or substantive issues with the analysis.
- Final Meeting (Instructor). Before presenting the final analyses to the collaborator, the student should schedule a meeting with the instructor to review the accuracy and interpretation of results to be presented.
- Final Meeting (Collaborator). The final meeting will be focused on presenting the analyses to the collaborator (and instructor should be included, if possible).

Analysis Report

An analysis report should be delivered to the collaborator in advance of the final meeting. There are different ways to accomplish this. For example, the PM516a textbook offers one template, while I use the template at (<https://uscbiostats.github.io/PM516/analysis-report/>). Be sure to use all principles learned in PM516a when completing the analysis report.

Debriefing

By the end of the semester, students will submit documentation of the hours worked, much like a consultant would submit an invoice of their work performed. The template will be provided to the students.

During the final exam period, the collaborator will be sent an evaluation form for constructive feedback on the student's performance. Students should acknowledge the receipt of this feedback.

The survey that will be distributed is given here:

Thank you for providing an opportunity for a PM516b student to become more involved in the research process this semester. I hope that the experience has been valuable for both you and the student. As a reminder, students were expected to spend approximately 25 hours on the project, and be involved in approximately 3-5 meetings over the course of the semester.

I am requesting your feedback on the experience you had with the student. This feedback will be shared with them in the spirit of constructive criticism.

1. Please type the name of the consultant with whom you worked.
2. Please rate your satisfaction with the following (Strongly Agree, Agree, Somewhat Agree, Disagree):
 - a. The consultant asked probing, open-ended questions so they could fully understand the scope of the project
 - b. The consultant followed up with an appropriate amount of communication through the span of the project
 - c. The consultant was polite and professional in their interactions
 - d. The consultant explained statistical concepts in a way that was understandable to a non-statistician collaborator
 - e. The consultant successfully used graphs and/or figures to communicate complex results
 - f. The summary report provided information that addressed the research question
 - g. The summary report provided a thorough interpretation of the statistical results
 - h. The content in the summary report was presented in a clear, professional manner
 - i. The consultant met all required deadlines
3. Please provide any additional constructive feedback you have for the consultant.

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:
Recall and apply the consulting principles learned in PM516a.	Instructor and Investigator Meetings	Debriefing
Apply statistical tools they have learned in their program to produce a meaningful analysis	Instructor Meetings, Analysis Report	Instructor Meetings, Debriefing
Summarize research questions and implement appropriate biostatistical methods to address such questions, understanding how different methodologies affect conclusions	Instructor Meetings, Analysis Report	Instructor Meetings, Debriefing
Create comprehensive, coherent consulting reports and interpret analyses for dissemination materials, such as the results sections of a manuscript.	Class Materials, Instructor Meetings and Feedback	Instructor Meetings and Debriefing
Evaluate statistical interactions with non-statistician collaborators to improve the quality of such interactions.	Investigator Meetings	Instructor Meetings
Understand how to work with individuals from diverse content domains	Investigator meetings	Debriefing

Course Schedule

	Topic	Deliverable
Week 1 M 1/8	Review of Statistical Consulting Best Practices Consulting with Clients SCS Brochure	
No Class M 1/15	Martin Luther King's Birthday	
Week 2 M 1/22	Trainings	Complete Required Trainings
Week 3 M 1/29	Project Assignment and Initial Meeting	Initial Meeting
Week 4 M 2/5	Analysis, Interim Meetings & Feedback	Interim Meetings
Week 5 M 2/12	Analysis, Interim Meetings & Feedback	Interim Meetings
No Class M 2/19	President's Day	
Week 6 M 2/26	Analysis, Interim Meetings & Feedback	Interim Meetings
Week 7 M 3/4	Analysis, Interim Meetings & Feedback	Interim Meetings
No Class M 3/11	Spring Break	
Week 8 M 3/18	Analysis, Interim Meetings & Feedback	Interim Meetings
Week 9 M 3/25	Analysis, Interim Meetings & Feedback	Interim Meetings
Week 10 M 4/1	Analysis, Interim Meetings & Feedback	Interim Meetings
Week 11 M 4/8	Analysis, Interim Meetings & Feedback	Interim Meetings
Week 12 M 4/15	Analysis, Interim Meetings & Feedback	Interim Meetings
Week 13 M 4/22	Final Check-In	Final Meeting (Instructor)
Week 14 M 4/29	Final Deliverable	Final Meeting (Investigator)

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>