

Sociology 5350
Quantitative Methods I
Fall 2022

(cross-listed as Demg 5350-401)

Course Description: This course is an introduction to the practice of statistics in social and behavioral sciences. This is the first semester of a two-semester sequence. It is open to beginning graduate students and--with the permission of the instructor--advanced undergraduates. Topics covered include the description of social science data, in graphical and non-graphical form; correlation and other forms of association, including cross-tabulation; bivariate regression; an introduction to probability theory; the logic of sampling; the logic of statistical inference and significance tests. There is a lecture twice weekly and a mandatory recitation ("lab")

Canvas Course Website: <https://canvas.upenn.edu/courses/1679686>

Instructor

Hans-Peter Kohler, 272 McNeil Building, 215-898-7686, hpkohler@pop.upenn.edu.

Office Hours: Thursdays, 1:30-2:50 p.m. (or by appointment)

Zoom link for Office Hours: <https://upenn.zoom.us/j/91445092723>

(Meeting ID 914 4509 2723)

Please sign up via Canvas Calendar.

Teaching Assistant:

Kai Feng, kaifeng@sas.upenn.edu

Office Hours: Mondays, 11am-noon or by appointment

Zoom link for Office Hours: <https://upenn.zoom.us/j/3039205574>

(Meeting ID: 303 920 5574)

Please sign up via Canvas Calendar

Lectures

Tuesdays and Thursdays, 12:00 - 1:00pm

McNeil Bldg (MCNB) 309

(<https://www.isc-cts.upenn.edu/finder/classroominfo.asp?id=mcnb-309>)

Recitation Sessions:

Soci5350-402: Friday 8:30-9:30am

McNeil Bldg (MCNB) 285

(<https://www.isc-cts.upenn.edu/finder/classroominfo.asp?id=mcnb-285>)

Soci5350-403: Friday 1:45-2:45pm

Fisher-Bennett Hall 138

(<https://www.isc-cts.upenn.edu/finder/classroominfo.asp?id=benn-138>)

Class Structure for Fall 2022

Soci 5350 is an important course for anybody interested in analyzing large social science and related datasets, and/or interpreting inferences and conclusions based on analyses of such datasets. Based on the experience in the Fall 2020, Soci 5350 has been restructured and "modernized" to maintain high academic quality of instruction, while being sensitive to the many ongoing challenges faced by our diverse student body. These changes are not minor, but are significant. We hope these efforts are successful, and allow a class experience that is rewarding in terms of learning and experience.

The key changes for the Fall Semester are as follows:

Return to in person class meetings: At this point, the expectation is that all class meetings for Soci 5350 in the Fall 2022 will be in person, as will be recitation sessions. We retain as default virtual office hours as this allows for additional flexibility, and the instructor and TAs are available for in-person office hour meetings upon request. We will follow University guidance if in-person class meetings have to be reassessed.

Asynchronous video lectures: Despite the fact that class meetings are in person, key substantive lectures will be delivered via short videos, and these videos will contain all of the methodological and substantive instructions that was previously provided during the in-class meetings. Videos will be 20-30 minutes for each scheduled lecture, and students are expected to view the videos prior to each lecture. The videos are available on Canvas (via Canvas Calendar or Lecture Notes).

Active learning: The in-person lecture time will then focus more on active problem-solving, mostly in the form of conducting empirical analyses of publicly-available datasets. Many of these analyses may focus on current topics, including the social and demographic aspects of Covid-19 in the US and elsewhere, illustrating how quantitative methods can be used to analyze real-world and policy-relevant topics. Class meetings are Tuesday + Thursday during noon-1:pm.

Assignment, Quizzes and Final Exam: There will be no Midterm. There will be regular Problem Sets (Assignments), about one per week (9 in total), plus additional quizzes (4 during the course of the semester). There will be a final exam. One quiz and one problems sets can be missed during the course without any penalty. Overall, this should help reduce exam anxiety, and provide timely feedback on the mastery of the course materials.

Recitations: There is one Recitation per week. Recitations will review course materials -- from both the video lectures as well as the in-person class meetings -- and they will be structured interactively to allow students to discuss specific questions related to course materials, as well as broader topics related to quantitative analyses and their applications in the social sciences. Recitations are scheduled at different times on Friday to allow flexibility. While it is encouraged to attend the recitation for which a student is registered, we will allow flexibility in this regard as long as recitations do not become "too crowded" to be effective.

Student Presentations: In order to facilitate class discussion and illustrate the broad applicability of statistical concepts, we each lecture will begin with a short presentation of about 5-8 minutes where class participants share an experience using and/or working with data and statistics. This can also be more of a "personal story" than a statistical presentation. For example, can describe how they "stumbled" upon an interesting research finding; or, some empirical puzzle that motivates your research agenda; or how you used some statistical information for personal or professional decisions; or how one empirical finding changed your view of politics or society; etc. The scope of these presentations is very broad, and it is intended to be informal (and thus not requiring much preparation). The primary aim is to have all of us share how we have used (or hope to use) data and statistics across the wide variety of disciplines and research interests that are represented in class. The instructor and the TAs will start presenting some of their experiences, and we will provide a sign-up sheet for the rest of the semester ([Link](#)) This presentation is required but not graded.

Canvas Course Website: The course will rely on a Canvas Course Website (<https://canvas.upenn.edu/courses/1679686>) for sharing course materials, assignments, quizzes and communication through message boards.

Textbook and Lecture Notes: The textbook for the course is: Moore, McCabe & Craig, *Introduction to the Practice of Statistics*, W.H. Freeman / MacMillan Learning, 10th Edition. The 6th, 7th, 8th or 9th editions are fine for content (and may be cheaper), but they may not have the correct problem sets. There is also an online version of the textbook (<https://www.macmillanlearning.com/college/us/product/Introduction-to-the-Practice-of-Statistics/p/1319244440> and on Amazon). Problem sets will be posted on the Canvas site. In addition, we will distribute lecture slides, data sets and programs that accompany the lectures.

Grading: Grades will be determined approximately as follows: problem sets 35%, quizzes 40%, final 25%. One quiz and one problems sets can be missed during the course without any penalty; if all assignment and quizzes are submitted, the assignment and quiz with the lowest score will be ignored.

Late Policy: For late quizzes and assignments, five percentage points will be deducted for each day the assignment/quiz is turned in late.

Software: The course use STATA for statistical analyses. Stata is a widely used software package in the social sciences and related fields, and it provides a sophisticated set of tools for data management, data description and statistical inference. The lecture will illustrate the application of statistical analyses in STATA, and STATA will be required for some of the assignments or quizzes. For students with sustained interests in statistical analyses, purchasing a STATA license may make sense (see <https://www.stata.com/order/new/edu/gradplans/student-pricing>). STATA BE (formerly Stata IC) is fully adequate for the course (as well as for a majority of analyses done by social scientists), and a 6-month license is \$48, increasing to \$94 for one year. The current version is STATA 17, but prior versions (at least back to STATA 13) are perfectly fine. In addition, STATA is available through the Penn Libraries Virtual Computer Lab (Penn vLab; <https://guides.library.upenn.edu/vlab>). Students who do not have their own STATA license will be able to complete all course requirements using STATA through this Penn vLab. Limited support for the R statistical analyses package is provided during the course, and students familiar with R can submit assignments, quizzes and/or exams using R.

Typical week: During a typical week, students will watch two (asynchronous) video lectures (approximately 30 min) prior to the class meetings, attend two synchronous class meetings (Tuesday + Thursday noon-1:00pm). Assignments or quizzes will take approximately 1-2 hours per week (total of 9 assignments and 4 quizzes), and recitation requires one hour per week. Attendance in class meetings or recitations will not be recorded, and attendance itself does not affect the course grade.

Office hours: The instructors, Hans-Peter Kohler, as well as the TA will hold office hours each week, and are available by appointment if students cannot attend the regularly scheduled office hours.