

Social Data Analysis Using Regression (SOCIOLOGY 461/461G)

This course satisfies the multiple regression course requirement for the Quantitative Social Data Analysis (QSDA) certificate program.

Lecture (M/W 1:00 pm-1:50 pm)

Lab section (W 2:00 pm to 2:50 pm)

Instructor: Dr. Aki Roberts

Email: aki@uwm.edu (this is the best way to reach me)

Office: BOL 740

Office Phone: (414) 229-6943

Office Hours: W, 3:00 pm to 5:00 pm or by appointment

Prerequisites: A passing grade in an introductory statistics course (such as Sociology 261) is a required prerequisite. Students should be familiar with descriptive statistics, basic probability, z-scores, hypothesis testing, correlation, and simple (bivariate) regression. Previous experience in statistical software will help, but is not required.

Course Overview: Introduction to multivariate regression analysis in social research using SPSS and R software. In introductory statistics classes, students learned to examine how one independent variable (X) influences a dependent variable (Y) via simple (bivariate) regression. As you can imagine, it is rarely realistic to think that only one X influences Y. Most theories in sociology, criminology, and other areas of social science suggest that multiple X's influence Y. For example, levels of economic deprivation, racial tension, and residential mobility are all considered influences on crime rates.

Sociol. 461 will present multiple regression analysis for examining the relationship between multiple X's and Y. Unlike other advanced statistics courses at UWM, Sociol. 461 does not cover details of statistical theory; instead the course is uniquely focused on hands-on practical experience with multiple regression analysis. The course will include analyses of a variety of real datasets that draw on information from cities, states, countries, or surveyed individuals. The practical emphasis of the course means that students should leave with strong applied knowledge of multivariate regression analysis with SPSS and R. Multivariate regression analysis with SPSS and R answer real-life research questions from a wide range of academic fields, and applied knowledge of multiple regression, SPSS, and R is a marketable skill for private- and public-sector employment, and further educational opportunities, after graduation. Sociol. 461 also serves as a review or prep class for new incoming graduate students from various academic disciplines before they take more in-depth or advanced statistics courses in their departments. The course is not intended as a substitute for graduate-level econometrics or biostatistics courses, but as a review or prep class it can complement existing graduate-level course offerings across the social and health sciences.

Course Objectives:

In Sociol. 461, students will learn how to conduct and interpret multiple regression analysis for examining the relationship between multiple X's and Y using SPSS and R software. Compared to a typical introductory statistics course, we will place greater emphasis on analyzing real data (for example, data from the Census, Uniform Crime Reports (UCR), General Social Survey (GSS), etc.) to address sociological or criminological questions, and less on calculator work with small examples. (Students will still need a calculator for some parts.)

The course will include both lectures and computer labs. Lectures focus on fundamental ideas about various forms of multiple regression and interpretation of results, and reinforce the ideas with examples

and exercises. Labs will be the setting for instruction in SPSS and R software. Lab material and exercises will focus on the execution of multiple regression analysis of real data using SPSS and R software, and will also provide experience in making interpretations of the resulting output.

Recommended Textbook: We will rely on class notes and handouts (highly recommended to get a binder), but students who want to also have a textbook can purchase *Multiple Regression: A Primer (Undergraduate Research Methods & Statistics in the Social Sciences)* by Paul D. Allison (1998) (available from the UWM e-bookstore).

Labs: Attendance at the lab section is required (section 801). The lab will be the setting for instruction in the SPSS and R that we will use for data analysis.

Lab Assignments: For undergraduate students, there will be 4 lab assignments covering (1) descriptive statistics/bivariate regression, (2) basic multivariate regression, (3) multivariate regression with categorical independent variables, and (4) multivariate regression with squared independent variables. For graduate students, there will be 5 lab assignments covering (1) descriptive statistics/bivariate regression, (2) basic multivariate regression, (3) multivariate regression with categorical independent variables, (4) multivariate regression with squared independent variables, and 5) data analyses with R. Assignments 1) - 4) will involve data analysis in SPSS and interpretation of the output (results). Assignment 5) will involve data analysis with R studio and interpretation of the output (results). Late assignments will not be accepted, except under the sort of special circumstances that apply to makeup exams (see below).

In-class Assignments: There will be 2 in-class assignments. Missed in-class assignments cannot be made up, except under the sort of special circumstances that apply to makeup exams (see below).

Exams: There will be a midterm and final exam. The date of the midterm is 10/23/19 (subject to change). The final exam will be given on 12/16/19 (Monday, 12:30-2:30). The final exam is cumulative (covers the entire semester). Both exams are closed book. Exams will consist of several short answer questions and interpretations of statistical output. The exams will not include questions about how to use SPSS or R. Cheating on the exams will result in a failing grade for the course and will be reported to University authorities.

Makeup exams: Makeup exams are possible only in special circumstances (e.g. military, jury duty, religious observances, conference presentations, family or medical emergencies). Note that family vacation is not a valid excuse. To be allowed to take a makeup, the student must contact me before the scheduled exam, and present appropriate documentation. Then I will decide whether a makeup exam can be taken. Once a makeup exam is scheduled, rescheduling is not allowed. Failing to show up for the scheduled appointment for the makeup exam results in the score of zero for the exam.

Research report: A research report (due by 12/13/19) is required. The report will involve multivariate regression analysis and interpretation that addresses a research question, and uses data, of the student's choosing. Students are encouraged to use city- or state-level data because they are easily accessible (for example, at the Statistical Abstract of the United States or American FactFinder, but other data can be used after discussion with the instructor. Report length depends on the results, but it is usually approximately 8 to 10 pages. I will deduct 10 points (each day) for late reports. Plagiarism on the report will result in a failing grade for the course and will be reported to University authorities.

Literature review (for graduate students): For the research report, graduate students must pursue a research question that has a solid theoretical basis. Therefore, in addition to the core of the research report, graduate students need to write literature review also (due by 12/13/19). The literature review should include discussion of the theory and a review of at least 5 previous quantitative works related to the student's research question. The literature review should be approximately 7 to 10 pages. There should also be a conclusion that revisits this theoretical material in light of the research results obtained. I will deduct 10 points (each

day) for late literature reviews. Plagiarism on the literature review will result in a failing grade for the course and will be reported to University authorities.

Attendance: Attendance is expected at all class and lab sessions. For each unexcused absence, a student's final total score in the course will be reduced by 2 points.

Class Manner: Do not be late to class nor leave early. Do not talk to classmates during class. Do not take cell phones out of your pocket/purse. If any of these becomes a problem for a student, that student will be dropped from the course.

Working Together: Students are allowed to get help from each other on homework, but cannot copy each other's answers (resulting in identical wording, duplication of unique mistakes, etc...). This is considered plagiarism. All students involved in this kind of plagiarism will receive a failing grade for the course and will be reported to the University authorities.

Estimated Time Commitment: In addition to time spent in class and lab (2.5 hours per week and 37.5 hours for the semester), the outside-class time commitment for this course is expected to average 5 hours per week (75 hours for semester) of studying class notes and materials (likely more before an exam, and less in other weeks) and completing assignments, and an additional 31.5 hours for the semester are expected to be necessary to complete the final research report. Graduate students are expected to spend an extra 60 to 80 hours during the semester on preparing their presentation, extra lab assignment, and literature review.

Grading: Final course grades are based on overall scores calculated by weighting different graded elements as follows:

Undergraduate

Midterm exam (20%)
Lab assignments (20%)
In-class assignments (10%)
Final exam (25%)
Research report (25%)

Graduate

Midterm exam (20%)
Lab assignments (16%)
In-class assignments (10%)
Graduate-only lab assignment (4%)
Final exam (25%)
Research Report (15%)
Graduate only Literature Review (10%)

There is no separate letter grade for lab – your course grade will apply to all 3 credits.

Topics and Tentative Schedule for Lecture:

Topics
Review (descriptive statistics, correlation, simple regression)
Basics of multiple regression
Discussion of term paper
Collinearity
[In-class assignment for regular multiple regression]
Multiple regression with categorical X(s) – Dummy variable approach
[In-class assignment on dummy variable approach]
[Midterm]
Discussion on term paper
Multiple regression using X squared
[In-class assignment on X squared]
Review
[Paper due]
[Final Exam]

Topics and Tentative Schedule for Lab:

Topics
Review of basic SPSS (entering data, descriptive analysis, correlation, and simple regression)
[Lab assignment 1 due]
Multiple regression in SPSS
[Lab assignment 2 due]
How to find data for term paper
Multiple regression with categorical X(s) in SPSS
[Lab assignment 3 due]
Work on term paper-related issues
Multiple regression using X squared
[Lab assignment 4 due]
R studio

The Secretary of the University maintains a web page that contains university policies that affect the instructor and the students in this course, as well as essential information specific to conduct of the course. The link to that page is: http://www4.uwm.edu/secu/news_events/upload/Syllabus-Links.pdf

Accommodations for Students with Disabilities. In the pursuit of equal access and in compliance with state and federal laws, the University is required to provide accommodations to students with documented disabilities. It is expected that a statement be placed on your syllabus informing students to contact you to arrange needed accommodations. A sample syllabus statement can be found here:

<https://uwm.edu/arc/wpcontent/uploads/sites/97/2015/08/Recommended-Syllabus-Statement.pdf>

Religious Observances. Policies regarding accommodations for absences due to religious observance are found at the following: <http://www4.uwm.edu/secu/docs/other/S1.5.htm>

Students called to active Military Duty. Accommodations for absences due to call-up of reserves to active military duty are found at the following: <https://uwm.edu/active-duty-military/>

Incompletes. You may be given an incomplete if you have carried a course successfully until near the end of the semester but, because of illness or other unusual and substantiated cause beyond your control, have been unable to take or complete the final examination or to complete some limited amount of course work. An incomplete is not given unless you prove to the instructor that you were prevented from completing the course for just cause as indicated above. The conditions for awarding an incomplete to graduate and undergraduate students can be found at the following: https://www4.uwm.edu/secu/docs/other/S_31_INCOMPLETE_GRADES.pdf

Discriminatory Conduct (such as sexual harassment). Discriminatory conduct will not be tolerated by the University. It poisons the work and learning environment of the University and threatens the careers, educational experience and well-being of students, faculty and staff. Policies regarding discriminatory conduct can be found at:

https://www4.uwm.edu/secu/docs/other/S_47_Discrimina_duct_Policy.pdf

Academic Misconduct. Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for respect of others' academic endeavors. Policies for addressing students cheating on exams or plagiarism can be found at the following:

<https://uwm.edu/academicaffairs/facultystaff/policies/academic-misconduct/>

Complaint Procedures. Students may direct complaints to the Sociology Department Chair or the Associate Dean for Social Sciences in the College of Letters & Sciences. If the complaint allegedly violates a specific university policy, it may be directed to the Sociology Department Chair, the Associate Dean for Social Sciences in the College of Letters & Sciences, or to the appropriate university office responsible for enforcing the policy. Policies may be found at:

https://www4.uwm.edu/secu/docs/other/S_47_Discrimina_duct_Policy.pdf

Grade Appeal Procedures. A student may appeal a grade on the grounds that it is based on a capricious or arbitrary decision of the course instructor. Such an appeal shall follow the established procedures adopted by the department, college, or school in which the course resides or in the case of graduate students, the Graduate School. These procedures are available in writing from the sociology department chairperson or the Academic Dean of the College of Letters & Science. Procedures for undergraduate student grade appeal can be found at:

<https://uwm.edu/letters-science/advising/answers-forms/policies/appeal-procedure-for-grades>

Procedures for graduate student grade appeal can be found at

<https://uwm.edu/graduateschool/appealing-academic-decisions/>

Final Examination Policy. Policies regarding final examinations can be found at the following:

<http://www4.uwm.edu/secu/docs/other/S22.htm>

Book Royalties. In accord with Department of Sociology policy, the royalties from the sale of faculty-authored books to students in their classes are donated to a UWM Foundation/Sociology Account to support future awards and activities for UWM students in Sociology.