

Sociology 360: Statistics for Sociologists I

University of Wisconsin-Madison

June 14 – August 8, 2021

Instructor: Morgan C. Matthews
Email: mmatthews5@wisc.edu
Office Hours: Wednesdays 3-4pm and by appointment

Course description: This course introduces methods of quantitative social research, and how they are used to describe and draw inference from social data. The first part of the course focuses on descriptive statistics. We will cover strategies for exploring and interpreting data and for examining relationships between variables. Topics covered include: describing data with bar charts, boxplots, and histograms; summary statistics; the normal distribution; scatterplots and correlation; regression; and two-way tables. We will also discuss the strengths and weaknesses of various methods of data production.

The second part of the course focuses on statistical inference. In this part of the course, we will discuss the logic and methods of making inferences about populations from sample data. In so doing, you will learn how to test hypotheses with a variety of statistical tests. Topics in this section include: the meaning of statistical significance, how to calculate confidence intervals, and how to conduct statistical tests for means, count data, and regressions. Throughout the course, you will analyze small bodies of data and interpret your findings.

Pandemic Acknowledgement: The COVID-19 pandemic continues to affect our personal and professional lives in countless ways. Many of us continue to deal with everyday risks, carework, and employment challenges related to the ongoing public health crisis. Many of us have not seen our friends and families in over a year. In addition to learning about statistics through a sociological lens, this class will be characterized by flexibility, care, and compassion.

The course was presciently redesigned for a fully online format in 2019; I have continued to adapt the course to allow for flexibility that acknowledges the challenges we face at work and at home during the pandemic. The course is asynchronous (other than office hours) to maximize flexibility for you. This means that the instructional and assessment portions of the course can be conducted on your own time. However, the course unfolds on a weekly basis and you are expected to meet weekly deadlines. Stay in contact and let me know what you need to get through the semester.

Canvas course URL: <https://canvas.wisc.edu/courses/253446>

Instructional Mode: Online

Prerequisites: Basic algebra skills.

Credits: 4 credits from weekly lectures, weekly homework, weekly discussion participation, data projects, and office hours

Required Text: Moore, Davis S. 2018. *The Basic Practice of Statistics, Eighth Edition*. New York: W.H. Freeman. (Available from various online retailers; rental rate from Amazon is \$53.70 as of April 2021. If buying/borrowing used, do NOT worry about whether the book comes with the CD.)

Software Resources: We will do a data analysis project for this course with the assistance of the [General Social Survey's Key Trends](#) tool. To complete this project, you will need to be able to access

and use this online tool, as well as take screenshots of graphs produced on this website. You will need to access equation tools in **word processing** for the data projects (e.g., MS Word). Finally, you will need to be able to access *either Stata or Excel* to complete a statistical analysis software competency.

Calculators: You will need a calculator for the homework assignments and online exams. The calculator must be able to perform basic functions, including adding/subtracting, multiplying/dividing, and squaring and square rooting numbers.

COURSE REQUIREMENTS

INSTRUCTION

Readings: You are assigned chapter readings from *The Basic Practice of Statistics, 8th edition* each week. These readings summarize the course concepts for the week and provide detailed examples of topics from probability and statistics. Since the weekly homework assignments are drawn from this textbook, you will find that the examples in the text of the chapter will often be useful in helping you answer the homework questions. You are expected to keep up with these required readings on a weekly basis.

Lectures: View instructional lectures on Canvas. The amount of time you need to budget for each week varies (see outline of lectures by module listed in the table on pg. 7). A good way to prepare for lectures is to read the chapter. After watching the lecture video, skim the chapter again, do the homework problems (and additional practice problems in the textbook if you are having difficulty), and then refer back to the text of the chapter again to solidify what you learned.

Office Hours: You are encouraged to seek help with the course material during weekly office hours. *Given that the course is conducted remotely due to COVID-19, all office hours will be held using the Zoom feature in Canvas.* This is the only “live” portion of the course. If you are not available for the instructor’s office hours and would like assistance, please email to discuss other options or to get assistance over email.

ASSIGNMENTS

1. Discussions: Each week, you will be asked to engage with the week’s course material through an online discussion. The purpose of discussion varies from week to week, but includes goals such as discussing data visualization in popular media and considering how statistics are used in an applied setting. The goal and expectations of each discussion will be elaborated in the modules on Canvas. A *minimum* of one post and one reply is expected for each discussion forum (for any exceptions on this, read the full discussion instructions for any given week).

Grading/Late Policy: Each discussion post/reply is worth a total of five points, and specific instructions are given in the assignment on Canvas about the distribution of those points. Because discussion depends on your timely contributions, 10% of points will be deducted for each day the assignment is late (deductions will occur automatically in Canvas). If you need an extension, email the instructor at least 24 hours in advance.

2. Homework: There are homework problems assigned each week that are due by Saturday evenings (see Course Schedule on p. 7). Homework will be submitted via Canvas and, in many cases, will be graded automatically (however, in some cases parts of the assignment that are short-response or file-upload questions will be graded by your instructor within 72 hours). *You are responsible for correctly entering your homework answers into the Canvas submission platform.*

Grading/Late Policy: Each homework assignment is worth a total of 100 points. Given the schedule of this online class, it is important that homework is completed by the due date. As a result, 10% of points will be deducted for each day the assignment is late (deductions will occur automatically in Canvas). If an emergency prevents you from turning in your homework on time, you may be able to get a short extension on the homework without penalty by contacting your instructor by email at least 24 hours before the assignment is due.

Since I understand that your schedule may not permit you to devote as much time as you would like to all of the homework assignments, your *lowest score will be dropped* when computing your final grade.

Cooperating on Homework Assignments: You are encouraged to discuss the problems on the weekly homework assignments with other students in the class to further your understanding of the material, but you must write up your answers independently. Your work should be your own.

3. Quizzes: There will be four non-cumulative quizzes. Quizzes will consist of about 12 multiple choice questions that require you to interpret results, consider appropriate analytic methods, and perform relevant calculations. While quizzes are due by 5pm Sunday evenings on the weeks they are assigned, they can be completed earlier than that (after you complete that week's homework assignment). **Collaboration is NOT permitted on quizzes.**

Grading/Late Policy: Quizzes will be graded automatically on Canvas, and must be completed by the deadline. Again, *you are responsible for entering the correct answers in Canvas for the quizzes*. If you cannot take an exam because of an unavoidable scheduling conflict (e.g., religious holiday, athletic event), you must **contact the instructor via email at least 1 week prior to the exam date**. If you have an emergency that prevents you from taking an exam, **contact the instructor as soon as possible**.

4. Data analysis projects: In addition to the homework, there will be a data analysis project that will be completed in two parts. This project is meant to put the material presented in the textbook into practice using real-world social statistics. Part 1 of the data project focuses on descriptive statistics and graphical display of data. Part 2 will require you to draw on your knowledge from the course to choose an appropriate significance test for the same data used in Part 1, and synthesize the two parts into a full written report. Further details will be distributed in class.

Grading/Late Policy: Each project is graded out of a total of 10 points. The data analysis projects will be submitted on Canvas and graded by a third party. As a result, **late project assignments will NOT be accepted**. Please email the instructor at least 24 hours in advance if you foresee any difficulties meeting the deadline.

5. Statistical analysis software competency: Finally, there is a short activity that can be completed at any time during the summer term that aims to provide a baseline competency in at least one data analysis software (your choice of either Stata or Excel) to explore data, calculate summary statistics, and produce graphs. *The end-of-term deadline is intended to give you flexibility in your schedule for completing this activity*. If you show full effort in completing the activity, you will receive full points for it.

Final Grades: Final grades will be calculated as follows:

Grade Item	Module	Due Date/Time	% or pts
Participation		(Thursdays by 11pm)	10%
Discussion Forum #1	1	6/17	5
Discussion Forum #2	2	6/24	5
Discussion Forum #3	3	7/1	5
Discussion Forum #4	4	7/8	5
Discussion Forum #5	5	7/15	5
Discussion Forum #6	6	7/22	5
Discussion Forum #7	7	7/29	5
Discussion Forum #8	8	8/5	5
Weekly Homework		(Saturdays by 5pm)	30%
HW 1	1	6/19	100
HW 2	2	6/26	100
HW 3	3	7/3	100
HW 4	4	7/10	100
HW 5	5	7/17	100
HW 6	6	7/24	100
HW 7	7	7/31	100
HW 8	8	8/7	100
Quizzes		(Sundays by 5pm)	35%
Quiz 1	1-2	6/27	12
Quiz 2	3-4	7/11	12
Quiz 3	5-6	7/25	12
Quiz 4	7-8	8/8	12
Data Analysis		(by 11:59pm)	20%
Part 1	4	7/11	10
Part 2	8	8/7	10
Statistical Software Comp		(by 11:59pm)	5%
Competency	any	by 8/8	5
		TOTAL	100%

Final grades will be computed as follows: A=93-100, AB=88-92.99, B=80-87.99 BC=76-79.99, C=68-75.99, D=50-67.99, F=< 50. I may curve the grades up if necessary, but I never curve down.

Accommodations. The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Please send the instructor an email by the end of the first week of the course if you are eligible for special arrangements or accommodations for testing, assignments, or other aspects of the course. This may be the case if English is your second language or you experience a physical or psychological condition that makes it difficult for you to complete assignments and/or exams without some modification of those tasks. Accommodations are provided for students who qualify for disability services through the McBurney Center. Their website has detailed instructions about how to qualify: <http://www.mcburney.wisc.edu/>. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA.

If you wish to request a scheduling accommodation for religious observances, send an email by the end of the second week of the course stating the specific date(s) for which you request accommodation; campus policy requires that religious observances be accommodated if you make a timely request early in the term. See the university's web page for details:

<https://kb.wisc.edu/page.php?id=21698>.

Course Learning Outcomes:

We have designed this course to achieve the following learning outcomes designated as priorities by the Department of Sociology:

- *Conduct Research and Analyze Data (primarily quantitative)*. Although professional-quality research requires graduate-level training, we expect that all undergraduate majors will be able to conduct small-scale research in which they formulate a research question, analyze data, and draw conclusions. Towards the goal, this course will offer you the basic but very serviceable training for quantitative data analysis.
- *Critically Evaluate Published Research*. Sociology graduates will be able to read and evaluate published research as it appears in academic journals and popular or policy publications. Because a majority of social science publications are based on quantitative research, this course will equip you with the knowledge critical to read and crucially evaluate much of social science research publications.
- *Communicate Skillfully*. Sociology majors write papers that build arguments and assess evidence in a clear and effective manner. In this course, you will learn how to write well about quantitative data analysis.
- *Critical Thinking about Society and Social Processes*. Sociology graduates can look beyond the surface of issues to discover the "why" and "how" of social order and structure and consider the underlying social mechanisms that may be creating a situation, identify evidence that may adjudicate between alternate explanations for phenomena, and develop proposed policies or action plans in light of theory and data. In this course, you will learn how to use statistical thinking and analysis to perform such tasks.
- *Prepare for Graduate School and the Job Market*. Students use their social research skills to identify opportunities for employment or further study, assess their qualifications for these opportunities, and identify strategies for gaining the necessary knowledge and experience to improve their qualifications. This course will offer one of the most valuable skills that you need as you prepare for graduate school and the job market.
- *Improve Project Management Skills*. Students will improve their skills in time management, ordering and executing a series of complex and inter-related tasks, and integrating distinct components of a project into a final product.

Sexual harassment and misconduct. Professional conduct and appropriate behavior are critical to create a safe learning environment for students and instructors alike. Here is a statement about sexual harassment from the University:

What is Sexual Harassment?

Unwelcome sexual advances, requests for sexual favors, and verbal or physical conduct of a sexual nature constitute sexual harassment when:

- submission to such conduct is a condition of employment, academic progress, or participation in a university program; or
- submission to or rejection of such conduct influences employment, academic or university program decisions; or

- the conduct interferes with an employee's work or a student's academic career, or creates an intimidating, hostile or offensive work, learning, or program environment.
- Tangible Action or Quid Pro Quo (This for That) Sexual Harassment and Hostile Environment Sexual Harassment are both illegal and unacceptable.

One practical implication is that instructors (faculty or graduate students) may not date students to whom they will be assigning grades. If you believe that you have been harassed, contact your instructor or the chair of the Department of Sociology (socchair@ssc.wisc.edu).

Academic integrity. By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison's community of scholars in which everyone's academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review.

According to UWS 14, academic misconduct is defined as:

- Seeks to claim credit for the work or efforts of another without authorization or citation;
- uses unauthorized materials or fabricated data in any academic exercise;
- forges or falsifies academic documents or records;
- intentionally impedes or damages the academic work of others;
- engages in conduct aimed at making false representation of a student's academic performance;
- assists other students in any of these acts.

For a complete description of behaviors that violate the University's standards as well the disciplinary penalties and procedures, please see the Dean of Students website. If you have questions about the rules for any of the assignments or exams, please ask your instructor.

Institutional statement on diversity: Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals.

The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world. <https://diversity.wisc.edu/>

Departmental notice of grievance and appeal rights. The Department of Sociology regularly conducts student evaluations of all professors and teaching assistants near the end of the semester. Students who have more immediate concerns about this course should report them to the instructor or to the chair, 8128 Social Science (socchair@ssc.wisc.edu).

SOC 360 Course Schedule Summer 2021

NOTE: The schedule below may change. All announcements regarding schedule changes will be emailed to you or announced in the course announcements. *You are responsible for keeping up to date on these changes.*

Week	Lectures	Lecture Time	Reading	Assignments
Module 0: Course Overview				
June 7-13	Introduction to Christine Schwartz (faculty member in videos) Introduction to Morgan Matthews (course facilitator)	2:59 1:46	Module 0 in Canvas	Quiz 0 (extra credit): June 16 by 5pm
Module 1: Univariate Analysis				
June 14-20	Lecture 1: Introduction & picturing distributions [Ch. 1-1]	23:19	Ch. 1, 2	DP*: June 17 by 11pm HW 1: June 19 by 5pm
	Lecture 2: Picturing distributions; Describing distributions [Ch. 1-2]	36:06		
	Lecture 3: Describing Distributions with Numbers [Ch. 2-1]	28:03		
	Lecture 4: Describing Distributions with Numbers continued [Ch. 2-2]	25:58		
Module 2: Normal Distribution & Bivariate Analysis				
June 21-27	Lecture 1: The Normal Distribution [Ch. 3-1]	23:49	Ch. 3, 4	DP: June 24 by 11pm HW 2: June 26 by 5pm Quiz 1: June 27 by 5pm
	Lecture 2: Density Curves: The Standard Normal Distribution [Ch. 3-2]	24:05		
	Lecture 3: Using the Normal Distribution in Practice [Ch. 3-3]	19:57		
	Lecture 4: Scatterplots & Correlation [Ch. 4-1]	19:41		
	Lecture 5: Scatterplots & Correlation continued [Ch. 4-2]	25:03		
Module 3: Bivariate Analysis, continued				
June 28- July 4	Lecture 1: Regression [Ch. 5-1]	26:42	Ch. 5, 6	DP: July 1 by 11pm HW 3: July 3 by 5pm
	Lecture 2: Residuals [Ch. 5-2]	30:43		
	Lecture 3: Two-Way Tables [Ch. 6-1]	16:46		
	Lecture 4: Two-Way Tables continued [Ch. 6-2]	16:08		
Module 4: Producing Data & Probability				
July 5-11	Lecture 1: Producing Data - Sampling [Ch. 8-1]	20:42	Ch. 8, 9, 12	DP: July 8 by 11pm HW 4: July 10 by 5pm Quiz 2: July 11 by 5pm Project 1: July 11 by 11:59pm
	Lecture 2: Producing Data - Sampling continued [Ch. 8-2]	28:16		
	Lecture 3: Producing Data - Experiments [Ch. 9-1]	14:12		
	Lecture 4: Producing Data - Experiments continued [Ch. 9-2]	21:41		
	Lecture 5: Introducing Probability [Ch. 12-1]	15:29		
	Lecture 6: Introducing Probability continued [Ch. 12-2]	13:24		
Module 5: Introduction to Statistical Inference				
July 12-18	Lecture 1: Sampling Distributions [Ch. 15-1]	27:31	Ch. 15, 16, 17	DP: July 15 by 11pm HW 5: July 17 by 5pm
	Lecture 2: Sampling Distributions [Ch. 15-2]	23:59		
	Lecture 3: Sampling Distributions [Ch. 15-3]	19:34		
	Lecture 4: Confidence Intervals [Ch. 16-1]	21:01		
	Lecture 5: Confidence Intervals [Ch. 16-2]	22:56		
	Lecture 7: Tests of Significance [Ch. 17-1]	15:28		
	Lecture 8: Tests of Significance [Ch. 17-2]	20:54		
	Lecture 9: Tests of Significance [Ch. 17-3] – OPTIONAL	25:16		
	Lecture 10: Tests of Significance [Ch. 17-4]	14:21		
	Module 6: Inference in Practice			
July 19-25	Lecture 1: Inference in practice [Ch. 18]	12:04	Ch. 18, 20	DP: July 22 by 11pm HW 6: July 24 by 5pm Quiz 3: July 25 by 5pm
	Lecture 2: Inferencing about a Population Mean [Ch. 20]	32:44		
Module 7: Inference About Variables				
July 26- August 1	Lecture 1: Comparing Two Means [Ch. 21]	29:39	Ch. 21, 22, 23	DP: July 29 by 11pm HW 7: July 31 by 5pm
	Lecture 2: Inference about a Population Proportion [Ch. 22-1]	14:40		
	Lecture 3: Inference about a Population Proportion [Ch. 22-2]	20:50		
	Lecture 4: Comparing Two Proportions [Ch. 23]	17:40		
Module 8: 8: Inference About Relationships				
August 2-8	Lecture 1: The Chi-square Test [Ch. 25]	31:51	Ch. 25	DP: August 5 by 11pm HW 8: August 7 by 5pm Project 2: August 7 by 11:59pm Quiz 4: August 8 by 5:00pm Deadline to finish stats software competency

* Under assignments, DP stands for Discussion Posts and HW stands for Homework