

Michael Lengefeld, PhD
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Office / Hours: Van Meter G18, Tues/Thu 11:30-1:00

Location: Hoffberger 102
M/W/F 12:00 – 1:10pm

Course Description

A significant share of scientific research uses quantitative methods (e.g., statistical analyses) to investigate social and environmental phenomena. Researchers use large national surveys, public opinion polls, and census data to document, describe, and explain a wide range of sociologically motivated research questions. For example, researchers have recently employed the techniques you will learn about to answer the following kinds of questions:

“Do people who grow up in impoverished communities have better or worse health than those who did not?”

“Are birth defects related to local levels of water pollution?”

“Is economic growth associated with carbon emissions?”

As students of this body of research, it is important to have a basic understanding of statistics if one is to be an active participant in the local, regional, national, and international dialog within the sociological community. The primary goal of this class is to provide each student with the requisite skills to not only understand the mainstream sociological research but also to be critical consumers of statistical information that is often presented as “factual”.

The course is divided into three sections that focus on descriptive statistics and inferential statistics and various applied statistical techniques. Descriptive statistics are methods that allow you to present a summary of individual and social characteristics (e.g., educational attainment, sense of self-esteem, racial and ethnic composition of residential areas). The primary concepts that we emphasize are *central tendency* (e.g., mean, mode, median) and *dispersion* (e.g., standard deviation, variance, inter-quartile range). Inferential Statistics is the backbone of statistical reasoning and it involves making estimates about a *population* (e.g., the entire country) based on a *sample* (e.g., a random selection of people from the country). This process necessarily involves the invocation of the basic rules of probability and it will introduce you to hypothesis testing which is used throughout the physical, behavioral, and social sciences. We will also cover bivariate and multivariate statistical techniques in great detail.

Expected Student Learning Outcomes	Method of Evaluation
1. Evaluate environmental sustainability issues by systematically using discipline-specific knowledge	Two exams, discussion leader, reflection journal, final project
2. Determine how personal and collective decisions and actions affect the environment	Reflection journal, essay questions on two exams, final project
3. Write effectively and analytically about contemporary nature-society relations	Discussions and in-class activities, final project

1. Evaluate environmental sustainability issues by systematically using discipline-specific knowledge. We will examine discipline-specific pieces of writing, information, and data in order to distinguish familiarize ourselves with the basic concepts, methods, and procedures of statistical analysis.

- 2. Determining how personal and collective decisions and actions affect the environment.** Environmental Studies majors make sense of empirical facts and findings as instances of more general social forms, processes, or relationships. The course will provide students with statistical literacy (the ability to explain the differences among various statistical techniques and identify an appropriate technique for a given set of variables and research questions).
- 3. Write effectively and analytically about contemporary nature-society relations.** Environmental Studies majors use statistical methods to systematically investigate and think critically about socio-environmental phenomena. They organize and analyze empirical materials to develop findings that illuminate social processes and problems, and can apply this knowledge to critically assess both scholarly research and popular press reports of data and research.

Resources and Grading

Required Texts

Bowen, Chieh-Chen. 2016. *Straightforward Statistics*. Sage Publications. ISBN: 9781483358918.

The textbook is required – no exceptions – and each student should bring their own copy. The course is organized around an active learning approach. This approach has two basic requirements: 1) You must attend class and do the assignments; and 2) You must bring your textbook to class every day.

Students should bring a printed or electronic version of the book to class each day. **This is the only time personal electronics are allowed in class** (see section on Classroom Civility below for details). All other readings will be available via the course website.

Learning Opportunities and Evaluation

<i>Assignment</i>	<i>Weight</i>
Participation	5%
Problem Sets	35%
Examinations (3 x 20% each)	60%

Letter Grade Scale

A 95%-100%	B-.... 80%-82%	D+.... 66%-69%
A-.... 90%-94%	C+.... 77%-79%	D 60%-65%
B+.... 87%-89%	C 73%-76%	F 59% and below
B 83%-86%	C- 70%-72%	

*A grade represents my best professional evaluation of a piece of work. It neither is, nor can be, a judgment about the person who submitted the work.

1. Participation and Attendance (5%): Attendance in lecture is mandatory. Any changes in the course syllabus and other announcements will be made in class and students are responsible for this information. In class assignments will be completed and turned in on some class and lab dates. To earn credit, you must be present.

2. Problem Sets (35%): All problem sets must be turned in via Canvas on the date and time indicated in the course schedule, unless otherwise specified. Late submissions ARE NOT accepted. If you have a conflict on that date, make arrangements to turn in your assignment early. DO NOT email problem sets, turn them in via Canvas. Before posting a document (assignment, paper, etc.) to Canvas ALWAYS save a

personal copy for yourself. Clearly name the document you post so that I can tell what it is and whose it is – for example, *ProblemSet1_Lengefeld.doc*. Post your documents in a format readable by Word, such as .doc, .docx, .rtf. This means if you do not work in Word you will need to save your document in a portable format that can be read by Word.

3. Three Examinations (60%): There are three in-class examinations (see schedule below). Each examination is cumulative and each is worth 20% of your overall grade. All examinations will count the same toward your overall grade. The third examination will be held during the final examination time but is still designed to be a 70-minute test.

Attendance: Students are permitted 3 class absences, no questions asked. Unless prior accommodations are established, any further absences will result in grade penalties; any student with five unexcused absences will fail the course.

Missed Examination: There will be no make-up tests given unless you receive permission from me *before* the exam is given. Written documentation of a serious emergency is required to be excused from taking an exam at the scheduled time. If you miss a scheduled exam without receiving prior permission to take a make-up test, you will receive a zero for that exam. No exceptions.

Missed Assignments/Late Work: If you miss a class (due to illness or other verifiable emergency) in which an assignment was due (e.g., pop quizzes/papers) and you do not contact me *beforehand*, you will receive a zero for that assignment. Contacting me beforehand is the *only* way any make-up work will be given. You are responsible for obtaining lecture notes from someone else in the class for the day.

Extra Credit: Students can earn up to five points of extra credit on their final grade by writing up to five letters to a legislator(s) regarding a topic or bill they are concerned about. Students must write (or type) and address the letter to the legislator and put it in a stamped unsealed envelope – emails or phone calls are not accepted. All letters must be submitted by the last week of November, and I will grade these based on completion (not content or position) and then mail them for you. No other extra credit opportunities are available in the course. These letters should follow the format found here:

<https://www.nlacrc.org/home/showdocument?id=272>

Classroom Civility: Very simply, do not disrupt the classroom environment. Specifically, please refrain from eating, reading, chatting, and wearing earphones during class. As a commonsense, movie-theater type of courtesy, please turn off your cell phones and do not distract me or others by texting or browsing the web. Do not schedule any activities that will require you to leave early or arrive late to class – please use the restroom facilities before class, during our regular break, or after class. Finally, laptops are a tool, and a tool can very useful for one task and detrimental for others – we would not use a hammer to install a screw. **The use of laptop computers, cell phones, or smartwatches in class is allowed only for specifically defined class activities, final presentations, or with my permission.** Students will turn off and store these items in their backpack during class. Use of these technologies during exams or quizzes will result in zero credit for the assignment. Research demonstrates that laptops can hinder classroom learning for both users and nearby students, but can be useful for specific learning activities: <https://www.sciencedirect.com/science/article/pii/S0360131512002254>. Please see me by the second week of the semester if you would like to discuss laptop use.

Email: I ask for your cooperation in using email only when truly necessary, **after first checking the syllabus** for your answer. In general, it is always best to meet in person for longer questions. If you would like to send me an email, please take your time with the message. Emails to professors are a form of formal writing; they are not the equivalent of sending a text message - “Text message” style responses are not acceptable. For example, your message should include a greeting: (“Hi Dr. Lengefeld,” “Hello,” “Hi

Professor,” etc.), sign your email, and proofread. I recommend waiting until you are at a computer before sending your message. This will give you the time and space to send a well-crafted email. The standard response time is 24-48 hours (weekdays), and I will do my best to respond to your message quickly during regular working hours, Monday-Friday, 8:30-5pm. I ask you to realize that I use email strictly as an information transfer medium, i.e., I maximize the efficiency of the correspondence. Hence, you should attempt to read neither subtext nor tone into the style of any response to your queries. Email should be considered a formal line of communication reserved for emergencies and questions not explicitly covered in the syllabus and handouts.

Incompletes: To be considered under extreme or exceptional circumstances.

Academic Honor Code: We will be working together as a community of writers and thinkers as we explore topics within environmental studies. While this means that no one will have to go through an assignment without any guidance, it also means that the work you submit as yours must be, in fact, your own. According to Goucher College policy, plagiarism is broadly defined as passing off someone else’s ideas or writing as your own work. If you are having difficulties with an assignment and are tempted to use someone else’s ideas, please come see me. We will work together to help you present your ideas in a manner that is original and your own. Plagiarism also includes self-plagiarism, or using the same writing in more than one class. If you would like to use writing from another class, you must have permission of both instructors. I take academic integrity incredibly seriously so please familiarize yourself with the guidelines of the Academic Honor Code regarding independent work, proper citation practices, and codes for learning. Please review Goucher’s Honor Code: <https://www.goucher.edu/learn/documents/Academic-Honor-Code.pdf>.

Accommodations: We all learn in different ways and have different strengths and capabilities. In an effort to honor all of our abilities, I will strive to create a supportive learning environment. Please feel free to discuss with me questions or concerns regarding disabilities or learning differences (especially invisible ones) by the second week of the semester. Please also take advantage of Goucher’s policies: <http://www.goucher.edu/learn/academic-support-and-resources/>

Religious Observance Policy: If you need to request accommodation for religious observance, fill out the following form: <http://www.goucher.edu/experience/getting-involved/religious-and-spiritual-life/documents/religious-holidays/Religious-Observance-Form.pdf> and submit it to me as soon as possible and at least two weeks before the observance. If you communicate with me in a timely manner and complete any mutually agreed upon make-up work, any such absences or schedule changes will be excused and will not adversely affect your grade.

Grade Questions: All questions concerning grades must be discussed with the professor in person, and **grades will not be conveyed via email**. Federal guidelines mandating the protection and privacy of student records (FERPA) can be found here: <https://nces.ed.gov/pubs97/web/97859.asp>

Support Services for Students

Academic Center for Excellence (ACE): The Academic Center for Excellence (ACE) is an academic support center that assists students in their effort to prepare for a life of inquiry, creativity, social responsibility and to develop a sense of personal and professional ethics and integrity. ACE provides individual academic coaching sessions, academic and wellness workshops and content-specific tutoring. <http://www.goucher.edu/learn/academic-support-and-resources/ace/>

Center for Race, Equity and Identity: The Center for Race, Equity and Identity (CREI) invites all students to engage in educational and co-curricular opportunities dealing with social justice, intersectionality and Critical Race Theory (CRT). CREI seeks to foster an environment in which

marginalized and oppressed community members feel affirmed and comfortable exploring and expressing their identities. From individual advising to group support and workshops open to the public, many services are offered to help build community and support your success. Learn more at www.goucher.edu/experience/equity-and-identity/center-for-race-equity-and-identity/

Counseling Services: Counseling services provided on campus are free, confidential, and do not require a referral. Services include brief individual counseling (typically 1-12 sessions), couples counseling, group counseling, and outreach and consultation. <http://www.goucher.edu/experience/staying-healthy/counseling-services/>

Office of Accessibility Services: Goucher College makes reasonable academic accommodations for students with documented disabilities. Students requesting accommodations must make their request and provide appropriate documentation to the Office of Accessibility Services (OAS). Because classes change every semester, eligible students must sign a Release of Information form at ACE in order for their professors to be notified to have the accommodations implemented. The Director of OAS (Arnelle Quashie Hanley) is available by appointment to answer questions and discuss any implementation issues you may have. Address general inquiries to 410-337-6146 or email access@goucher.edu.

Library: Our librarians are available to help students define and refine their research questions and aid their search for the appropriate supporting materials. www.goucher.edu/library/

Qualitative Reasoning Center: The Quantitative Reasoning (QR) Center supports students in mathematics, science, social science, and other courses with a QR emphasis with programming for student development of quantitative literacy and applications of mathematics and math-based skills to real-life situations. This semester, the QR Center will host drop-in tutoring (no appointment needed!) for students in STEM-based courses who need help with math-based skills or content involved in their coursework. Programming for the QR Center occurs in the Learning Commons (previously Information Commons) in the Athenaeum, and the schedule will be posted on the QR Center website (TBD). Please contact Dr. Justine Chasmar Stauffer at Justine.chasmar@goucher.edu or 410-337-6302 with questions.

Title IX Office: Goucher College seeks to provide an environment that is free of bias, discrimination, and harassment. If you have been the victim of discrimination/sexual harassment/misconduct/assault, we encourage you to report this. **If you report this to a faculty member, she or he must notify our Title IX coordinator about the basic facts of the incident including your name.** For more information about your options at Goucher visit: <https://www.goucher.edu/title-ix/>

Additionally, there are confidential resources available to you on campus who do not have to share your disclosure with the college:

- Health and Counseling Services (first floor of Heubeck Hall): 410-337-6050 for Health Center appointments; 410-337-6481 for Counseling Center appointments, (note walk-ins for counseling services are also accepted)
- Chaplain Cynthia Terry (basement of the Chapel), 410-337-6048
- Rabbi Josh Snyder: 410-337-6545
- Peer listeners: 443-632-7799, call any night between 7 p.m. and 2 a.m. to make an appointment.

Writing Center:

The Writing Center, located on the 3rd floor of the Athenaeum, is available to assist you with any academic, personal, or professional writing project. Writing tutors are trained to work with you on all stages of your writing process, from brainstorming to organizing, to editing your papers. Each tutoring session is individually designed to help meet your particular needs. Simply bring the writing prompt, your

draft (if you have one), and your questions about the writing to your appointment. Here is a link to the Center's website: www.goucher.edu/writingcenter

Course Outline and Reading Assignments

*lecture topics are approximate and subject to variation
lecture topics will not necessarily correspond to readings
readings are due on the first day of the week they are listed*

Date	Unit/Topic
Fri. 8-23	Syllabus, Course Expectations and Course Outline

Section 1: Descriptive Statistics

Week 1: August 26-30. Introduction to Statistics. (Read Bowen Chapter 1).

No class September 2 (Labor Day).

Week 2: September 4-6. Summarizing and Organizing Data. (Read Bowen Chapter 2).

Problem Set #1: Due Friday, September 6th

Week 3: September 9-13. Descriptive Statistics. (Read Bowen Chapter 3).

Week 4: September 16-20. Standard Z Scores. (Read Bowen Chapter 4).

Problem Set #2: Due Friday, September 20th

Examination #1 – Friday, September 20th

Section 2: Inferential Statistics

Week 5: September 23-27. Basic Principles of Probability. (Read Bowen Chapter 5).

Week 6: September 30-October 4. The Central Limit Theorem. (Read Bowen Chapter 6).

Problem Set #3: Due Friday, October 4th

Week 7: October 7-9. Hypothesis Testing. (Read Bowen Chapter 7).

October 10 thru 13th Fall Break

Week 8: October 14-18. Review of inferential statistics. (Read Bowen Chapter 7).

Problem Set #4: Due Friday, October 18th

Examination #2 – Friday, October 18th

Week 9: October 21-25. One-sample t-Test. (Read Bowen Chapter 8.)

Week 10: October 28- November 1. Chi-Square and Nonparametric Statistics. (Read Bowen Chapter 14).

Week 11: November 4-8. One-way Analysis of Variance. (Read Bowen Chapter 13)

Problem Set #5: Due Friday, November 8th

Week 12: November 11-15.

Week 13: November 18-22. Correlation. (Read Bowen Chapter 11).

Problem Set #6: Due Friday, November 22nd

Week 14: November 25. Simple Regression. (Read Bowen Chapter 12).

November 27 - December 1 **Thanksgiving Break**

Week 15: December 5. Simple Regression. (Read Bowen Chapter 12).

Problem Set #7: Due Monday, December 5th

December 6 Final Day of Classes

Final Exam Tuesday, December 10, 09:00am to 11:00am

Required Format for submission is a Word document saved as: LastName_ES140_Name of Assignment

Note: I reserve the right to make changes in the syllabus and course schedule at any time.