

EASTERN MENNONITE UNIVERSITY at Lancaster
STAT 140 O: Elementary Statistics (Online)

STAT 140 O
Spring 2024
Jan 8th 2024 to May 2nd 2024
Online

Jason Martin
jason.martin@emu.edu
Phone: email to make appt.
Office hours: by appt.

COURSE DESCRIPTION:

This course provides an introduction to descriptive and inferential statistics as applied to understanding research. Topics include correlation, normal distributions, confidence intervals, and hypothesis testing. Google Sheets/Excel will be used periodically throughout the course. Guidance Counselor approval of mathematical competency required.

Credits: Three in Mathematics (Core)

COURSE OBJECTIVES:

Upon completing this course, the student should be able to:

- A. Compute, understand, and apply both descriptive and inferential statistics.
- B. Critically interpret statistical analyses presented in scientific publications and other media.
- C. Appreciate the relative effectiveness of quantitative analysis as it is applied to understanding the world around us.
- D. Collect, process, and analyze data to address a research question.
- E. Articulate the role of data analysis in sociological inquiry.

BOOKS AND MATERIALS:

- Required Text: Moore, Notz and Fligner. *The Basic Practice of Statistics*. 7th edition
- Supplemental resources will be made available via Moodle.

ATTENDANCE POLICY:

Because this is an asynchronous online course, attendance and participation will be evaluated based on the timeliness and level of engagement regarding weekly activities, discussion threads, and other required work. All course content is cumulative, building on previous course content. Therefore, engaging with and keeping up with the course material is essential to your success in this course.

COURSE REQUIREMENTS AND EVALUATION:

- A. Participation and Discussion (15%): Your participation and discussion grade is primarily derived from your responses to weekly activities, discussion threads, and other required work.
- B. Homework (20%): Most weeks will include a homework assignment, assigned via Moodle. This homework will typically involve practice work from the text book. The assignment should be turned in by the listed due date. These may be submitted via the online portal or via scanned hard copies. If you cannot turn in an assignment for any reason, please contact me ahead of time to discuss. Each homework assignment will be graded on a five point scale with the majority of points earned for completion and effort. At the end of the semester these assignments will be combined to count toward your homework grade (20% of the total).
- C. Quizzes (20%): There is one quiz in the first half of the semester and one quiz in the second half, each worth 10 percent of your total grade. Each quiz will focus primarily on the content covered in the four weeks leading up to the day of the quiz. Like the exams, quizzes will be comprised of multiple choice questions, short answers, and calculations. Quizzes will be open book and assigned during a specific time window (*conferring with classmates is not permitted*).

If you are not available during the specified time window, please notify me ahead of time.

- D. Examinations (40%): There is a mid-term and final examination for the course. The mid-term is worth 20% percent of your grade and the final is worth 20%. The final IS cumulative, but will focus on the content from the second half of the course. Exams will include a combination of multiple choice questions, short answers, and calculations. They will be open book exams assigned during a specific time window (*conferring with classmates is not permitted*).

If you are not available during the specified time window, please notify me ahead of time.

- E. Data Report (5%): (Optional Portfolio Use) The data report is an individual exercise that requires students to analyze and interpret data. A more detailed assignment sheet will be distributed during the course and it will be due during the last week of the course.

GRADING:

Participation and Discussion	=	15%
Homework	=	20%
Quiz 1	=	10%
Midterm Exam	=	20%
Quiz 2	=	10%
Final Exam	=	20%
<u>Data Report</u>	=	<u>5%</u>
Total	=	100%

Grades are assigned as follows:

93-100 = A	73-76 = C
90-92 = A-	70-72 = C-
87-89 = B+	67-69 = D+
83-86 = B	63-66 = D
80-82 = B-	60-62 = D-
77-79 = C+	0-59 = F

COURSE OUTLINE:

***Weekly readings, assignments, discussion posts, will be due by the end of the day on Saturday (e.g. all Week one materials will be due by midnight on the first Saturday). Any required follow up to initial discussion threads will be required by the end of the following Wednesday.**

I. Foundations of Inferential Statistics

Week 1 Introduction
(1/8 to 1/13) Chapter 1: Picturing Distributions with Graphs

Week 2 Chapter 2: Describing Distributions with Numbers
(1/14 to 1/20) Chapter 3: The Normal Distributions

Week 3 Chapter 4: Scatterplots and Correlation
(1/21 to 1/27) Chapter 5: Regression

II. Producing Data

Week 4 Chapter 8: Producing Data: Sampling [brief]
(1/28 to 2/3) Chapter 9: Producing Data: Experiments [brief] **[Quiz 1]**

III. From Data Production to Inference

Week 5 Chapter 12: Introducing Probability [brief]
(2/4 to 2/10) Chapter 13: General Rules of Probability [brief]

Week 6 Chapter 15: Sampling Distributions
(2/11 to 2/17)

Week 7 Chapter 16: Confidence Intervals **[Mid-Term Exam]**
(2/18 to 2/24)

IV. Inference about Variables

Week 8 Chapter 17: Tests of Significance: The Basics
(2/25 to 3/2) Chapter 18: Inference in Practice

Spring Break**V. Inference about Relationships**

Week 9 Chapter 20: Inference about a Population Mean
(3/10 to 3/16)

Week 10 Chapter 21: Comparing Two Means
(3/17 to 3/23)

Week 11 Work on data report (and catch-up) **[Quiz 2]**
(3/24 to 3/30)

Week 12 Chapter 22: Inference about a Population Proportion
(3/31 to 4/6) Chapter 23: Comparing Two Proportions

Week 13 Chapter 25: Two Categorical Variables: Tables and the Chi-Square Test
(4/7 to 4/13)

Week 14 [Looking forward] Chapter 26 Inference for Regression and
(4/14 to 4/20) Chapter 27: One-Way Analysis of Variance: Comparing Several Means

Week 15 **[Data Report and Final Exam]**
(4/21 to 4/27)

STUDENT HANDBOOK:

The Student Handbook (<https://emu.edu/studentlife/>) contains policies, information, and resources. This section of the syllabus highlights several key items.

CLASSROOM CULTURE & RELATED POLICIES:

EMU's [Life Together](#) statement describes the sort of learning community that we aspire to be. Learning thrives where there is free and open exchange of ideas, thoughts, emotions, and convictions. Open discourse requires trust and safety. While I anticipate that you may find that some aspects of the class challenge your views and theoretical frameworks, I invite you to respectfully express either agreement or disagreement without fear of consequences. If you feel that I am violating this commitment, please make an appointment to meet outside of class so that we can discuss the issue.

I hope we can welcome differences and demonstrate a willingness to analyze issues from frameworks that may or may not feel comfortable. I have opinions, which I may express from time to time. Please be sensitive in your class participation by not unfairly dominating discussions. Be aware of others' right to speak and welcome questions from your classmates. My goal is to create a brave space in which everyone learns to participate in scholarly dialogue that values listening, thinking, feeling, study, and professionalism. (*Adapted from Margaret Saltee and Kathryn Roulston*)

1. Our primary commitment is to learn from each other. We will listen to each other and not talk at each other. We welcome differences amongst us in backgrounds, skills, interests, and values. We realize that it is these very differences that will increase our awareness and understanding through this process.
2. We will trust that people are always doing the best they can.
3. Challenge the idea and not the person. We debate ideas, not the individual sharing this idea or practice.
4. Each of us will strive to speak our discomfort. When something is bothering you, please practice sharing this with the group. Often our emotional reactions offer valuable learning opportunities.
5. Step Up, Step Back. Be mindful of taking up much more space than others. On the same note, empower yourself to speak up when others are dominating the conversation.
6. Stay engaged. When overwhelmed or stressed, it can be tempting to slip away from the class or group while meeting. Let us honor one another with focused connection. When we catch ourselves disengaging, let us gently refocus on the tasks at hand.

INCLUSIVE, COMMUNITY-CREATING LANGUAGE POLICY

EMU is committed to creating and maintaining an inclusive, safe, supportive educational environment that fosters respect for others and is free from intolerance directed toward individuals or groups. As such, EMU expects all its faculty, staff, and students to adopt inclusive written and spoken language that welcomes everyone regardless of race or ethnicity, religious identity, gender, disabilities, age, and sexual orientation. We will strive to use respectful and welcoming language in our classrooms.

As an inclusive community, we strive to sustain safety and belonging for students of all gender and sexual identities expressed in the [LGBTQIA+ Student Support Policy](#).

BIAS RESPONSE

Bias incidents are harmful to the EMU community and/or individuals within the EMU community. Bias can be intentional or unintentional and may be directed toward an individual or group. A bias incident may take the form of a verbal interaction, cyber-interaction, physical interaction, or interaction with property. Bias reporting is a resource for anyone who needs to communicate an incident or explore a better understanding around issues of discrimination and learning how to effectively respond. All members of the university community are encouraged to [report](#) incidents of bias.

PROGRESS REPORTS:

All students will receive formative feedback after the fourth week of semester-long classes and after the third week of half-semester classes. Formative feedback provides students with a holistic ‘snapshot’ of their academic performance and engagement in this course and is not formally recorded. This feedback is provided early enough in the semester to inform the student’s performance in order to succeed in the course. Professors use class attendance and participation, timely assignment completion, quiz/test scores, and other factors to assess how a student is currently progressing in their class. Students who would benefit from additional assistance will be notified via email. Within one week of receiving this feedback students should discuss with their professor, academic advisor, and/or other supporting folks (coaches, student life staff, mentors) and make plans for adjusting their performance in this course.

RELIGIOUS HOLIDAYS:

EMU respects the diversity of religious holidays and wishes to provide reasonable accommodations for students who may be unable to fully participate in class, lab, exams, or other assignments due to observation of a significant religious holiday. Students should provide adequate notice (a week in advance) to the faculty of such requests.

ALL-CAMPUS SPECIAL EVENTS DAYS:

On all-campus special event days when classes do not meet, students are expected to participate in organized activities for an amount of time equal to or exceeding the time that would have otherwise been spent in class sessions. These experiences are designed to meet learning outcomes associated with EMU core values and commitments as well as to build a sense of community among students, faculty, staff and the greater community. EMU values include peacebuilding/conflict transformation (restorative practices), unifying leadership, community building, equity and inclusion (dignity), affirming difference and undoing bias, intercultural learning, environmental sustainability, civic engagement, service/community engagement, social justice, active faith and religious literacy, Anabaptist understandings, vocational exploration, integrative life skills, innovation/creativity/scholarship, and celebration/spirit.

ACADEMIC ACCOUNTABILITY & INTEGRITY:

In accordance with EMU mission, vision, and life together statements, we expect academic integrity of all members of the community. Responses to [violations](#) of academic integrity will be handled according to this [procedure](#). EMU fosters a culture where faculty, staff, and students respect themselves and others. EMU faculty and staff care about the integrity of their own work and the work of their students. They create assignments that promote interpretative thinking and work intentionally with students during the learning process. Honesty, integrity, trust, fairness, respect, and responsibility are characteristics of a community that is active in loving mercy, doing justice, and walking humbly before God. At EMU, a transparent account for academic work involves producing and submitting one’s own work in papers, essays, projects, quizzes and tests; correctly and consistently acknowledging sources used; factually representing research results, one’s credentials, and facts or opinions; and appropriately documenting use of technology.

TURNITIN:

For this class, you will submit a paper, via Moodle, to a learning tool and plagiarism prevention system provided by EMU called Turnitin. When grading your work, I will interpret the originality report accordingly and will follow [the Academic Accountability Procedure](#) as appropriate. For more information about Turnitin, please see [this site](#). Note that submitted papers become part of the Turnitin.com database.

DISABILITY RESOURCES:

If you have a physical, psychological, medical, or learning disability that may impact your work in this course, it is your responsibility to contact the Office of Academic Access (<http://www.emu.edu/academics/access/>) on the third floor of the Hartzler library. This office will work with you to establish eligibility and to coordinate reasonable accommodations. All information and documentation is treated confidentially.

ACADEMIC SUCCESS CENTER TUTORS:

Please take advantage of the free individual tutoring from Academic Success Center tutors. ASC tutors are undergraduate students trained to support students in particular courses and programs. Tutors also offer occasional study group options. To make an appointment, access [ASC Tutoring](#) through quick links on myEMU. *Lancaster Students:* Students desiring other forms of tutoring or academic support should contact Lisa Sauder at lisa.sauder@emu.edu. Additionally, Students who need assistance with writing should contact Lisa and she will put you in contact with Undergraduate Writing Coach, Matthew Hummer, or Graduate Writing Coach, Rachel Whitmer on main campus.

TITLE IX:

*The following policy applies to any incidents that occur (on or off campus) while you are a student registered at EMU. It does not apply to incidents that happened **prior to your enrollment at EMU**.*

It is important for you to know that all faculty and staff members are required to report known or alleged incidents of sexual violence (including sexual assault, domestic/relationship violence, stalking). That means that faculty and staff members cannot keep information about sexual violence confidential if you share that information with them. For example, if you inform a faculty or staff member of an issue of sexual harassment, sexual assault, or discrimination, they will keep the information as private as possible. However, they are required to bring it to the attention of the institution's Title IX Coordinator. If you would like to talk to the Title IX Coordinator (Kimberly Anderson, JD) directly, she can be reached at 540-432-4849 (4TIX) or titleixcoordinator@emu.edu. You can also report incidents or complaints through the [online portal](#). You may confidentially report incidents of sexual violence if you speak to Counseling Services counselors, University Chaplain and Seminary Campus Pastor, or Health Services personnel providing clinical care. These individuals, as well as the Title IX Coordinator, can provide you with information on both internal and external support resources.