Syllabus- Technical Skills for Statisticians

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Student Hours: Schedule here

Time: MW 10:00 - 11:15
Location: ANSC A228-East

Course Description

Creation of research reports, business reports, and executive summaries. Presentation strategies, consequences of statistical modeling for real-world decision making, and countering common misconceptions and errors in statistical reasoning. Focus on real-world applications in research, business, and public service.

Course Objectives

At the end of this course, students should know how to:

- Write a statistical business report and give a presentation on a topic using appropriate information flow, graphics, and provided templates.
- Write a scientific article, using appropriate structure, graphics, citations.
- Document a data set and an analysis so that operations performed are reproducible and justified.
- Explain the consequences of statistical modeling decisions in an understandable and technically correct manner.
- Counter and preempt common misconceptions and errors in statistical reasoning in practical situations.
- Write a CV/cover letter.

Textbook

This course will use three different OER (open educational resource) textbooks:

- Open Technical Communication, by Tijerina, Powell, Arnett, Logan, & Race. (abbreviated OTC)
- Entering the Conversation (abbreviated ETC), an open composition textbook by Naomi Salmon (Ed)
- Scientific Writing for Health Research (abbreviated SWHR), which is generally useful for scientific writing and statistical/data related topics not covered by the other two resources.

Other resources have been added to the course canvas page. All books and resources used in this course are available online or through the UNL library free of charge.

Class Schedule & Topic Outline

This schedule is **tentative** and **subject to change**. Students are expected to read the corresponding textbook chapter(s) **before coming to class**.

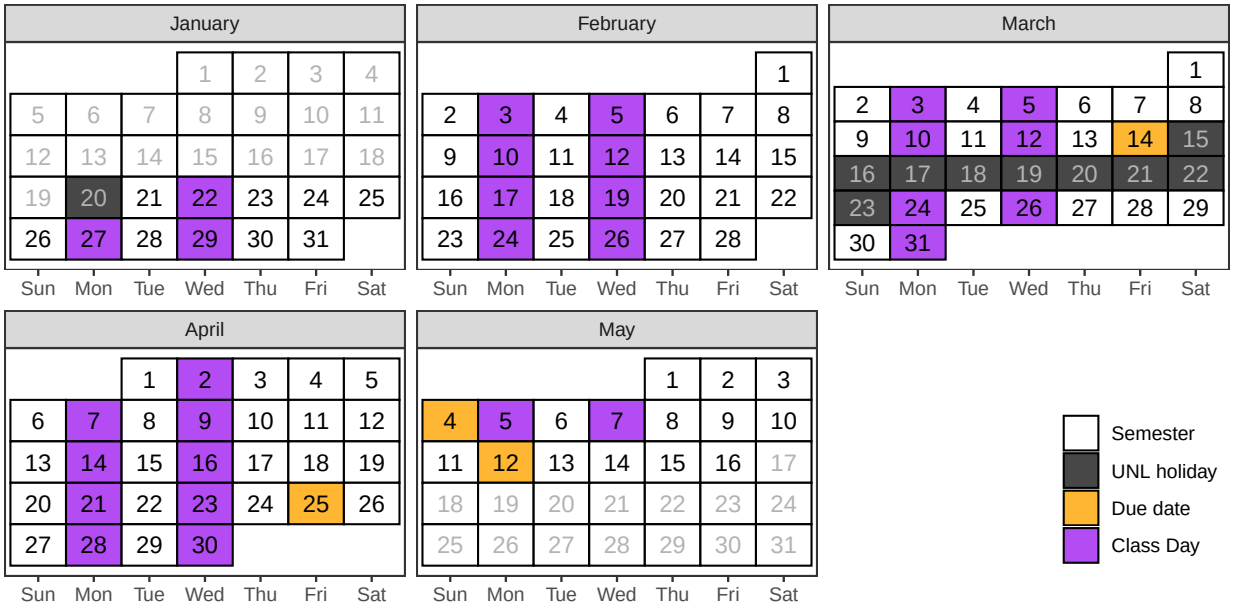

Figure 1: Course Calendar

Table 1: Tentative schedule of class topics

Week	Topic	Important Dates
1	Getting Started	
2	Communicating You!	
3	References	
4	Organizing Information	
5	Making an Argument	
6	Problem Statements & Data	
7	Methods & Procedures	
8	Charts, Tables, and Diagrams	User Guide Due: Mar 14
9	Results	
10	Introductions and Conclusions	
11	Abstracts & Summaries	
12	Countering Logical Fallacies	
13	Reports and Presentations	Business Report Draft Due: Apr 25
14	Editing and Revising Your Work	
15	In Class Presentations	Business Report Due: May 04
16	NA	Portfolio Due: May 12

Course Structure

Assessment/Grading

Assignments	Weight
Reading Quizzes	10%
Homework	40%
Technical Documentation Guide	20%
Business Report & Presentation	20%
Portfolio	10%

Lower bounds for grade cutoffs are shown in the following table. I will not "round up" grades at the end of the semester.

Letter grade	X +	X	X -
A	97.0	94.0	90.0
B	87.0	84.0	80.0
C	77.0	74.0	70.0
D	67.0	64.0	61.0
F	<61.0		

Interpretation of this table: A grade of 84.3 will receive a B. A grade of 78.8 will receive a C+. A grade of 73.9 will receive a C-. Anything below a 61 will receive an F.

Course Components

Reading Quizzes

You will have weekly reading assignments which introduce the weekly focus area. In order to motivate the importance of this reading, you will be given a weekly reading quiz on Canvas which covers the requisite material. These quizzes are open-note, but not open-classmate - please do them independently. Quizzes will be due before the first class of the week (e.g. by 10 am Monday). No credit will be given for quizzes received after the due date/time.

Homework

Weekly formative assignments (assignments meant to help you practice skills) will be given throughout the semester. The only way to learn the skills taught in this course is to practice - writing, citing, doing research, summarizing, and so on.

- You will typically have about one week to work on each assignment.
- Assignment due dates are specified on Canvas.
- Assignments must be submitted in the file format specified, and should run or compile as submitted for credit to be given.
- I will attempt to grade formative assignments within a week of the specified due date.

- Formative assessments may be resubmitted for partial credit subject to the terms of the resubmission policy below.

Participation

All students are expected to attend and fully participate in class activities. Participation grades will be determined based on a combination of class attendance and activities. Participation will be equivalent to a homework grade, and two absences are allowed without any reduction in participation score.

Projects

There are 3 primary projects in this course: a technical documentation guide based on a statistical journal article, a business report and presentation, and a portfolio showcasing your writing over the course of the semester. As part of these projects, you will be expected to participate in peer evaluations of written and oral work, and provide thoughtful, constructive comments.

These projects have been designed to support your learning objectives and connect different topics throughout the course. Weekly homework assignments will often be related to your project topics and will help you to work through the writing revision cycle over the course of the semester.

Course Policies

Late Work Policy

I reserve the right not to grade (or to assign a 0 to) any assignments received after the assignment due date.

Reading Quizzes

No late reading quizzes will be accepted. These quizzes are designed to ensure that you are prepared for class; accepting late quizzes does not meet this design goal.

Projects

Late projects/papers will not be excepted unless the following conditions are ALL met:

- Extenuating circumstances that are not a result of poor planning (e.g. sudden death in the family, car accident, serious illness)
- You contact me as soon as practical given the circumstances (prior to the due date), asking for permission to hand the assignment in late
- I grant permission to hand the assignment in late
- We agree on a new due date

Homework

You may submit a homework assignment that was not submitted in time as a resubmission, assuming it meets the conditions outlined in the next section.

Resubmission Policy

Learning how to write is a process that requires an attempt and then subsequent improvement. Do not be afraid to make mistakes! I allow you to re-submit each formative/homework assignment once.

Note: The resubmission policy does NOT apply to projects.

This policy is subject to the following constraints:

- You should resubmit assignments as soon as possible.
- You may not resubmit an assignment for which solutions have been posted.
- Each assignment should be resubmitted only once.
- Resubmissions are due no later than 2 weeks after the initial due date. In addition, to ensure adequate time to grade assignments,
  - Resubmissions from weeks 1-7 must be submitted by Friday at 5pm of week 8 of classes
  - Resubmissions from weeks 8-14 must be submitted by Monday at 5pm of week 15 of classes
- Resubmitted assignments will be graded at my convenience.

I spend the extra time grading resubmissions because it reinforces your learning; while it may improve your grade, this is a side effect and not the primary goal.
I reserve the right to adjust the resubmission policy, limit resubmissions, or introduce a penalty for resubmissions during the semester to ensure that it is meeting the objective of reinforcing your learning.

Attendance

You are expected to attend class, and I will take attendence periodically (not necessarily at every class session). Consistent, repeated failure to attend class or actively participate in the course will affect the participation portion of your grade.

If you are feeling ill, please **do not come to class**. Instead, review the material, work on the homework assignment, and get notes from a classmate. To make up your participation points, schedule an appointment with me to meet virtually within a week of the missed class date. In the appointment description field on Calendly, indicate that this appointment is to substitute for your in-class participation on the date you missed. Calendly meetings will provide you with participation points for up to 2 absences.

Inclement Weather

If in-person classes are canceled, you will be notified of the instructional continuity plan for this class by Canvas Announcement. In most circumstances where there is power in the Lincoln area, we will hold class via Zoom if the university cancels class.

Expectations

You can expect me to:

- reply to emails within 2 business days
- be available in class to assist with assignments
- be available by appointment for additional help or discussion

I expect you to:

- Complete the reading and class preparation material before coming to class
- Engage with the material and your classmates during class
- Seek help when you do not understand the material
- Communicate promptly if you anticipate that you will have trouble meeting deadlines or participating in a portion of the course
- Do your own troubleshooting before contacting me for help (and mention things you've already tried when you do ask for help!)
- Be respectful and considerate of everyone in the class

Assignment Evaluation Criteria

In every assignment, discussion, and written component of this class, you are expected to **demonstrate that you are intellectually engaging with the material**. I will evaluate you based on this engagement, which means that technically correct but low effort answers which do not demonstrate engagement or understanding will receive no credit.

When you answer questions in this class, your goal is to show that you either understand the material or are actively engaging with it. If you did not achieve this goal, then your answer is incomplete, regardless of whether or not it is technically correct. This is not to encourage you to add unnecessary complexity to your answer - simple, elegant solutions are always preferable to unwieldy, complex solutions that accomplish the same task.

Grammar and spelling are important, as is your ability to communicate technical information in writing; both of these criteria will be used in addition to assignment-specific rubrics to evaluate your work.

Academic Integrity and Class Conduct

You will be engaging with your classmates and me through in-person discussions and collaborative activities. It is expected that everyone will engage in these interactions civilly and in good faith. Discussion and disagreement are important parts of the learning process, but it is important that mutual respect prevail. Individuals who detract from an atmosphere of civility and respect will be removed from the conversation or the classroom.

Students are expected to adhere to guidelines concerning academic dishonesty outlined in Article III B.1 of the University's Student Code of Conduct. The Statistics Department academic integrity and grade appeal policy is available here.

Code

You must be able to explain how the logic works for any code you turn in. This means that code you obtained from e.g. StackOverflow is fine to use if you can explain it and modify it for the purposes of this class, but if you cannot explain your code you will not get credit for the assignment. This is in line with what is generally considered acceptable behavior in programming - reuse is fine (subject to the code's license) but you must be able to fully explain and modify any code you did not write yourself.

Writing

With the proliferation of AI tools such as Chat-GPT, I reserve the right to replace project and homework grades with grades based on an oral discussion of your submissions. If you cannot explain the logic behind your submission, how you came to the approach you used, and identify the tradeoffs behind decisions you made, then you will not receive credit. Chat GPT can be a useful tool, but this course's objectives are meant to assess your ability to communicate statistical information to a target audience effectively, not your ability to use AI systems. Fundamentally, you need to understand concepts and develop written fluency in technical language and statistical concepts to communicate effectively; generative AI solutions may hamper both of these goals if you rely on them too much.

Generative AI

Technical writing is more clear and concise than other types of writing, and nuances are extremely important. To date, generative AI is not particularly good at these goals - it is wordy and uses nonstandard language, and as a predictive model, it cannot structure its output for human understanding. It may be useful to leverage AI tools to ensure that your work conforms to grammar and style guidelines, but I very highly discourage the use of generative AI to create any content for class assignments.

Any use of generative AI must be disclosed in an appendix to your submission - this includes brainstorming, editing, using AI as spell-check/grammar-check, and so on. You must document the following:

- the version of the generative AI used
- the full sequence of prompts and responses
- any additional inputs you provided to the AI system
- a "diff" between the AI responses and your submission, showing exactly what was generated by the AI system and what you changed.

Required University Information

See https://executivevc.unl.edu/academic-excellence/teaching-resources/course-policies.