Note: This is a document-ized version of the syllabus in Canvas, which used tabs and links. I have attempted to preserve the formatting as much as possible without altering the content in any way.

Welcome to Stat 850! This course has historically been taught as a mixed in-person and online course as well as a 100% face-to-face course. In the era of COVID-19, it seems prudent to prepare as if the course would be taught online, making use of any available face-to-face time to interactively engage with each other and the material. This class will require you to prepare for class by reading the material, working through practice exercises, and watching videos (as necessary), while your assignments will largely be completed during any class time that we have. [Read more about this format (and the reasoning behind utilizing it).](https://canvas.unl.edu/courses/119290/pages/flipped-classrooms-how-this-course-is-set-up-and-why)

* [Contact details and Office hours](#tabs-0)
* [Description and Objectives](#tabs-1)
* [Course Resources](#tabs-3)
* [Assessment and Grading](#tabs-4)
* [Course Policies](#tabs-2)
* [Emergency Procedures](#tabs-5)

Instructor: Susan Vanderplas   
[susan.vanderplas@unl.edu](mailto:susan.vanderplas@unl.edu)   
Hardin 349A   
Personal website: <https://srvanderplas.netlify.app/>  
Office hours: By appointment. Make an appointment [**here**](https://calendly.com/vanderplas/stat-850-office-hours). If there are no appointments available which work with your schedule, email for additional options.

Teaching Assistant: Jayden Stack   
jstack9@huskers.unl.edu   
Hardin Hall 349B   
Office hours: By appointment. Make an appointment [**here**](https://calendly.com/vanderplas/stat-850-office-hours). If there are no appointments available which work with your schedule, email for additional options.

## Course Description

Introductions to statistical computing packages and document preparation software. Topics include: graphical techniques, data management, Monte Carlo simulation, dynamic document preparation, presentation software.

## Course Goals

1. Learn how to use R and SAS for data analysis, data processing, and data visualization.
2. Become familiar with the process, techniques, and goals of exploratory data analysis.
3. Create, assess, and debug code effectively.
   1. Use online resources to find software to perform a task, comparing approaches taken by competing programs.
   2. Read error messages, find related problems in online forums, and isolate the conditions necessary to generate the error.
   3. Generate minimum working examples or reproducible examples of errors in order to ask for help effectively.
4. Communicate statistical results using reproducible, dynamic tools. Understand the importance of reproducibility in scientific computation.

## Course Objectives

(what you should be able to do at the end of this course)

1. Clean and format the data appropriately for the intended analysis or visualization method. (Goals: 1)
2. Explore a data set using numerical and visual summaries, developing questions which can be answered using statistics. (Goals: 1, 2)
3. Evaluate methods or software to assess relevance to a problem. Compare similar options to determine which are more appropriate for a given application (Goals: 1, 3)
4. Test and debug software, using the following sequence: (Goals: 3, 4)
   1. Reproduce the error in a new environment,
   2. Create a minimal reproducible example,
   3. Research the error message and evaluate online resources for relevance,
   4. Ask for help, describing the error or problem appropriately.
5. Document the data, methods, and results of an analysis using reproducible methods. (Goals: 1, 2, 4)

## Course Policies

### Expectations:

You can expect Jayden and I to:

* reply to emails within 48 hours during the week (72 hours on weekends)
* be available in class to assist with assignments
* be available by appointment for additional help or discussion

I expect you to:

* Read the module material and watch the videos 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

### Make Mistakes!

Programming is the process of making a series of silly or stupid mistakes, and then slowly fixing each mistake (while adding a few more). The only way to know how to fix these mistakes (and avoid them in the future) is to make them. (Sometimes, you have to make the same mistake a few dozen times before you can avoid it in the future). At some point during the class, you will find that you've spent 30 minutes staring at an error caused by a typo, a space, a parenthesis in the wrong place. You may ask for help debugging this weird error, only to have someone immediately point out the problem... it is always easier to see these things in someone else's code. This is part of programming, it is normal, and you shouldn't feel embarrassed or sorry (unless you put no effort into troubleshooting the problem before you asked for help)

If you manage to produce an error I haven't seen before, then congratulations. You have achieved something special, and that achievement should be celebrated. Each new and bizarre error is an opportunity to learn a bit more about the programming language, the operating system, or the interaction between the two.

### Netiquette

This course involves online discussions. It is important to maintain professionalism and mutual respect in these discussions. Here are some guidelines:

* Do not dominate any discussion.
* Do not use offensive language.
* Never make fun of someone's ability to read or write.
* Use simple English.
* Use correct spelling and grammar.
* Share tips with other students.
* Keep an 'open-mind' and be willing to express even your minority opinion.
* Be aware of the University's Academic Honesty Policy.
* Think before you push the 'Send' button.
* Do not hesitate to ask for feedback.
* When in doubt, always check with your instructor for clarification.

Failure to adhere to these guidelines will result in a loss of participation points for the class. Repeated violations will result in your removal from the online discussion space.

### Attendance Policy

You are expected to attend class and/or participate virtually. Consistent, repeated failure to attend class or actively participate in the online portions of the course will affect the participation portion of your grade.

### Late Assignments

Late assignments will be accepted only under extenuating circumstances, and only if you have contacted me prior to the assignment due date and received permission to hand the assignment in late. I reserve the right not to grade any assignments received after the assignment due date.

### [Face Mask Policy](https://www.unl.edu/facultysenate/Face Coverings Syllabus Statement July 2020.pdf)

An individual in this course has a documented need for face coverings to be required in this course. Without divulging personal or identifying information, such a documented need might be that a member of their household is unable to be vaccinated or has a health condition that makes vaccines less effective for them. As a result, the College of Agricultural Sciences and Natural Resources has determined that face coverings will be required in this course. If you are unwilling to comply with this requirement, please visit with your advisor about different sections or possible alternative courses that you might take in lieu of this one.

### Academic Integrity and Class Conduct

You will be engaging with your classmates and me through in-person discussions, zoom meetings, 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.

Students are expected to adhere to guidelines concerning academic dishonesty outlined in Article III B.1 of the [University's Student Code of Conduct](http://stuafs.unl.edu/dos/code). The Statistics Department academic integrity and grade appeal policy is available [here](https://statistics.unl.edu/grade-appeals-and-academic-integrity-policy).

### Students with Disabilities

Students with disabilities are encouraged to contact the instructor for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 132 Canfield Administration, 472-3787 voice or TTY.   
  
I personally have ADHD and prosopagnosia. While you're probably familiar with the first one, the second one is a bit less well known - basically, I can't recognize faces. When my husband gets a haircut, I will walk right past him in the grocery store and not recognize him until he moves (I can recognize him by his walk). I will do my best to learn your names, but please bear with me, because it's particularly hard when I can't associate your name with your face.

### Mental Health and Wellbeing Resources:

UNL offers a variety of options to students to aid them in dealing with stress and adversity. Counseling and Psychological & Services (CAPS) is a multidisciplinary team of psychologists and counselors that works collaboratively with Nebraska students to help them explore their feelings and thoughts and learn helpful ways to improve their mental, psychological and emotional well-being when issues arise. CAPS can be reached by calling  [402-472-7450](tel:+1-402-472-7450). Big Red Resilience & Well-Being provides one-on-one well-being coaching to any student who wants to enhance their well-being. Trained well-being coaches help students create and be grateful for positive experiences, practice resilience and self-compassion, and find support as they need it. BRRWB can be reached by calling  [402-472-8770](tel:+1-402-472-8770).

## Written Course Materials

In keeping with the principles of this course, any course materials I develop will be made available on GitHub, in the (continuously evolving) [course textbook](https://srvanderplas.github.io/unl-stat850/). The book is laid out with the same structure as the course. In order to avoid duplicating content available elsewhere, where it is appropriate, I will link to relevant material available on other sites. This makes the course easier to maintain, but it also ensures you get the most relevant and up to date instructions.

## Course Videos

Pre-recorded videos demonstrating various course concepts will be posted before each class. These videos may show you how to e.g. write a function, execute code, load libraries, or they may be more conceptual lectures on topics such as data types, code modularity, or the grammar of graphics.

As class will be an interactive, hands-on experience, in order to be prepared for class, you should watch the videos and read the corresponding material in the book before class starts.

## Tech Support

* University Tech support
* SAS - Contact Steve Westerholt for software problems
* R/RStudio - Contact Dr. Vanderplas
* If you are interested in learning Linux, I am happy to help you with the installation of the operating system and the software necessary for this class.
* This class will involve using images and resources through the Holland Computing Center. You should contact them for help if you can't get resolution by asking me or your classmates. They also hold office hours weekly where you may be able to get some help.

## Technology and Canvas

This class will require you to use Canvas and GitHub. Content will be delivered via Canvas, GitHub, and VidGrid videos. You can download the textbook fairly easily by cloning the github repository (so it is accessible offline, at least in theory), but you need to have an internet connection for Canvas and watching the videos.

I will make announcements via Canvas, so please check Canvas frequently. I may also make contact via email, so please check your huskers email on a regular basis as well. A good way to stay on top of this is to download the Canvas student app, turn on Canvas notifications, link those notifications to your emails, or a combination of all three. Assignments will be due on Fridays at 10pm unless otherwise specified, so please keep that in mind.

## Assessment

Your final grade will be computed as follows:

* Weekly Assignments and/or Quizzes- 50%
* Class participation - 25%
* Project - 25%

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

|  |  |  |  |
| --- | --- | --- | --- |
| Letter grade | X + | X | X - |
| A |  | 94 | 90 |
| B | 87 | 84 | 80 |
| C | 77 | 74 | 70 |
| D | 67 | 64 | 61 |
| F | <61 | | |

Interpretation of this table: A grade of 85 will receive a B. A grade of 77 will receive a C+. A grade of 70 will receive a C-. Anything below a 61 will receive an F.

### General 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 unwieldly, complex solutions that accomplish the same task.

 While this is not an English class, 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.

### Assignments

The primary method of assessing your computing skills will be through weekly assignments. These assignments are intended to demonstrate your understanding of the topics covered in the course. You may work on programming assignments in groups as long as each person contributes equally and understands the solutions.

I understand that it may take some time to learn certain topics effectively. If you believe you now understand a topic more effectively than you did when the homework assignment is submitted, please feel free to include that particular learning objective in your project. If you have included a demonstration of that skill in your project code, and if you comment on the original assignment that you would like to get points back for this particular learning objective via the project, I will be happy to consider your request. Learning to code is a process, and it's not necessarily linear, so if you get the topic by the end of the class, I'm happy to give you credit for your learning, even if it didn't occur according to the course schedule.

### Participation

Your participation in the class via face-to-face (or zoom-based) discussions and Yellowdig posts (online message board integrated into Canvas) will factor into your course grade. Both the frequency of your participation (e.g. attendance, commenting on classmates' responses, asking questions on the discussion board) and the quality of your participation (asking meaningful and informative questions, providing useful answers) will be evaluated as part of the participation component of the course. Yellowdig discussions will ask you to read some information and write a couple of paragraphs in response; once you have written your response, you should also take the time to comment and engage with other students' responses.

If you choose not to attend class, you can still receive credit for "class participation" if you engage with the homework material and ask questions via the discussion board (or if you interact with me via zoom). Basically, you get participation points for actively wrestling with the material, not for showing up.

You will get participation points if you make an appointment with me to ask questions or work through an issue (or even just to chat). Communication is important, and it helps me adjust my materials and presentation style to be more effective, which helps you.

### Project

The course will also require a final project, which will allow you to demonstrate your statistical computing skills. Additional details, requirements, grading rubrics, and supporting material will be provided about halfway through the course, but minimally, you will be expected to record a presentation using either slides or a poster, and submit a reproducible report in lieu of an exam. You will evaluate your classmates' presentations as part of your project grade as well.

This project will require that you identify an interesting dataset, clean it appropriately, and visualize or analyze the dataset using methods we have discussed in class. You can start looking for "interesting" datasets now.

Writing and communication are important parts of any technical course. Your project writeup is expected to use correct grammar and make a coherent point. You are encouraged to make use of the writing center to help refine your work before you submit it for grading.

The Writing Center can provide you with meaningful support as you write for this class as well as every course in which you enroll. Trained undergraduate and graduate peer consultants are available to talk with you about all forms of communication. You are welcome to bring in everything from lab reports, presentations, and research papers to cover letters, application essays, and graduate theses and dissertations. Writing Center Consultants can work with you at any stage of the writing process, from brainstorming and organizing your ideas through polishing a final draft.

To learn more, please visit  <https://www.unl.edu/writing/online-writing-center-services>. Sign up any time by visiting  [unl.mywconline.com](https://unl.mywconline.com/). For more information about the Writing Center, please visit  [unl.edu/writing](http://www.unl.edu/writing).

## Emergency Procedures

In case of a(n)

### Fire Alarm (or other evacuation)

In the event of a fire alarm: Gather belongings (Purse, keys, cellphone, N-Card, etc.) and use the nearest exit to leave the building. Do not use the elevators. After exiting notify emergency personnel of the location of persons unable to exit the building. Do not return to building unless told to do so by emergency personnel.

### Tornado Warning

When sirens sound, move to the lowest interior area of building or designated shelter. Stay away from windows and stay near an inside wall when possible.

### Active Shooter

* Evacuate: if there is a safe escape path, leave belongings behind, keep hands visible and follow police officer instructions.
* Hide out: If evacuation is impossible secure yourself in your space by turning out lights, closing blinds and barricading doors if possible.
* Take action: As a last resort, and only when your life is in imminent danger, attempt to disrupt and/or incapacitate the active shooter.

UNL Alert: Notifications about serious incidents on campus are sent via text message, email, unl.edu website, and social media. For more information go to: [emergency.unl.edu.](https://emergency.unl.edu/)

General tech/canvas help:

[edit your user profile](https://community.canvaslms.com/docs/DOC-1865)

[set up your notifications](https://community.canvaslms.com/docs/DOC-1286)

[structure your online learning](https://teaching.unl.edu/keep-learning/)