

Statistical Methods for Researchers I

ST511 (601), FALL 2023 Syllabus

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INSTRUCTOR INFORMATION

Instructor: Dr. Dan Harris

- Email: doharris@ncsu.edu
- Zoom office hours: Tuesdays 5:30-6:30 pm Eastern Time & by appointment

Teaching Assistant (TA): Jianian Wang

- Email: jwang95@ncsu.edu
- Zoom office hours: TBA

COURSE INFORMATION

Course Credit Hours: 3

Course Description: Basic concepts of statistical models and use of samples; variation, statistical measures, distributions, tests of significance, analysis of variance and elementary experimental design, regression and correlation, chi-square.

Prerequisites/Corequisites: Graduate Standing (no prior statistical knowledge necessary)

COURSE DELIVERY AND STRUCTURE

- This online course delivers all learning materials, activities and assignments through **Moodle**, a secure and easy-to-use online learning platform.
- The course is **asynchronous**; students have no real-time class meeting requirements.
- Learning materials and activities include:
 - **Guided note outlines:** Contain key text and graphics for each topic; some topics may be broken into multiple note outlines. Definitions and examples will be filled in by students with the help of the online lectures. These outlines are a student's major resource in completing the weekly assignments and semester exams.
 - **Online lecture videos:** These narrated presentations take the place of face-to-face lecture. Students will use the content in these videos to complete the guided note outlines. These videos are intentionally kept short, so there will be multiple videos for each outline.
 - **Weekly assignments:** Administered through the Moodle quiz feature. Provide students with early feedback on how well they are understanding course content. More information is provided in the [table](#) on course grading components.
 - **Discussion forums:** There are two types of discussion forums in the course:
 - Required weekly discussion postings, which help students apply course content while building community. More information is provided in the [table](#) on course grading components.
 - Optional Student to Student Discussion Forum, which provides a space (in addition to virtual office hours) for students to ask questions about course content. Available at the top of the course Moodle page.

COMMUNICATION

Announcements

- Students are expected to check their NCSU email regularly to receive course announcements. Students who do not use their NCSU email should arrange to have this email forwarded to an account they do use. Due to university regulations the instructor can send course announcements only to NCSU email addresses.
- Weekly emails with important information and due dates will be sent via the Moodle announcements feature; additional announcements may be sent as necessary. All announcements will also be available via the link at the top of the course Moodle page.
- Posts to the Student to Student Discussion Forum (for asking questions about course content) will be sent as an email to the entire class (including the instructor and TA). Subscription to this forum is optional but recommended.

Email Policies

- **Students who have questions about course logistics or policies should email the instructor directly** (rather than the TA). Please include the course and section number in your email.
- **Email the instructor for grading questions related to exams, and the TA for any other grading related questions.**
- Questions about course content are best addressed in office hours or student-to-student discussion forum. Since this course is online, the instructor and the TA will have virtual office hours. Students who cannot attend the posted times may make an appointment via email for other times.
- If you have a verbal conversation with the instructor or TA during office hours that require action on their part, please send a follow-up email to them to ensure they have a written record (and a reminder) of your request.

Response Time

- Students should expect to receive a response to email within 48 business hours.
- Weekly assignments will be automatically graded, with scores available as soon as a quiz closes. Feedback on these assignments will be available within the quiz itself.
- Exams will be graded within 1-2 weeks of the end of the exam window. Feedback for the midterm will be provided via email. Feedback for the final exam is available by request.

Virtual Office Hours

- Office hours are held via Zoom and can be accessed using the link at the top of the course Moodle page.
- Office hours are drop-in; **no appointment is necessary.**

COURSE LEARNING OUTCOMES

Upon completion of this course, students will be able to:

1. Discuss important issues of data collection (sampling methods and study design), including identifying common biases and ways to avoid them.
2. Identify and implement appropriate analyses, including exploratory data analysis (EDA), confidence intervals, hypothesis tests, and/or simple linear regression analysis, for quantitative variables and categorical response variables.
3. Construct appropriate conclusion(s) to address a research question of interest.

Each of the above learning outcomes contributes to the overarching objective of the course:

4. Students will be able to describe and appropriately implement each step of the scientific method (i.e. statistical process).

COURSE TOPICS AND SCHEDULE

Week Beginning	Topic	Important Dates on Campus
21-Aug	Topic 1: Data Collection	8/25: Last Day to add w/o permission
28-Aug	Topic 2: Data Summary	9/1: Census Date
4-Sep	Topic 3: Random Variables and Distributions	9/4: Labor Day
11-Sep	Topic 4: Sampling Distributions	
18-Sep	Topic 5: Confidence Intervals	9/19: Wellness Day
25-Sep	Topic 6: Hypothesis Test Basics	
2-Oct	Midterm Exam covering Topics 1-6 (10/4-10/6)	
9-Oct	Fall Break	10/9-10: Fall Break
16-Oct	Topic 7: Hypothesis Tests, Errors, and Power	10/19: Drop Day
23-Oct	Topic 8: Intervals and Testing for Two Populations	
30-Oct	Topic 9: Analysis of Variance	
6-Nov	Topic 10: Chi-Square Tests	
13-Nov	Topic 11: Simple Linear Regression and Correlation	
20-Nov	Topic 12: Inference for Simple Linear Regression	11/22-24: Thanksgiving
27-Nov	Complete Topic 12	
4-Dec	Final Exam covering all Topics (12/6-12/8)	12/5: Last Day of Classes
11-Dec		12/15: Grades due

Please note: course schedule is subject to change.

COURSE MATERIALS

Required Materials

- **Guided Note Outlines:** *No cost.* There is no required textbook for the course; the note outlines are the main resource to help students learn course content. Outlines should be printed and completed by the student based on content in the online lecture videos. Completed outlines are the best resource to prepare for discussion posts, quizzes, and exams.
- **SAS Statistical Software:** *No cost.* Students will be exposed to the statistical software SAS, which is widely used in analysis of research data. To access SAS:
 - Students may use SAS on the [Virtual Computing Laboratory](#) (VCL). Machines in the VCL are assigned on a reservation basis and may fill up; students should plan accordingly to ensure assignments are completed on time. There is no cost for using the VCL. For more information, note the link "How Do I Get Started" under the "Help & Documentation" menu of the main VCL page. Questions about the VCL should be addressed to the [NCSU Help Desk](#).
 - Students may request access to the web-based SAS Studio; click [this link](#) and follow the instructions for independent learners.
 - Students may install the software on their own machine for free.
 - For information on obtaining SAS for your own machine see software.ncsu.edu/campus/sas/
 - Note that you must install both the software and a license file; for help with either of these, please contact the [NCSU Help Desk](#).
 - Students who are near campus can use SAS at a variety of campus laboratories.
- **Basic calculator:** *Cost varies but should be minimal.* Should have square and square root functions in addition to basic addition, subtraction, multiplication, and division.
- This is an online course. By registering an online course, you accept the responsibility of getting access to all supporting materials for it, including computer, internet and software. You are responsible for getting access to reliable, stable and fast internet. You should make sure that you can get access to all the online materials and all the necessary supporting software. Computer and internet and software related issues or any technical issues won't be an acceptable reason for any unsatisfactory performance or accommodations or exceptions.

Optional Materials

- **Textbook:** *An Introduction to Statistical Methods and Data Analysis* by R. Lyman Ott and Michael T. Longnecker. Cengage. (ISBN 978-1-305-26947-7). 7th edition.
 - The textbook is a good source of additional examples and practice problems. No homework problems will be assigned from the textbook.

COURSE GRADING POLICIES AND COMPONENTS

Grade Component	%age	Description
Required discussion board postings	20%	<ul style="list-style-type: none"> Students will be broken into small groups that will change a few times during the semester. Groups will answer questions using an online discussion board. There will be 12 discussion board topics, each requiring an initial post and a response. Initial posts will typically be due on Thursdays and responses on Sunday; see Moodle for specific dates. A discussion board will be due during the last week of classes. Each posting will be worth 10 points total. Lowest 2 total scores (initial post + response) will be dropped. This includes postings missed due to technical problems or for excused reasons such as illness. Grades will be based on the quality of responses. A rubric will be provided with the instructions for each specific post. Requests for discussion board regrades or other grade related issues must be made within 3 business days of the date on which the grade is posted Students are expected to treat each other with respect on the discussion boards; postings that are disrespectful will receive a score of zero.
Weekly assignments (Quizzes)	20%	<ul style="list-style-type: none"> There will be 12 online assignments administered through the Moodle quiz feature. Each will be tied to a specific note outline; students should work through the corresponding lectures before attempting a quiz. Quizzes will generally be due on Sundays; see Moodle for specific dates. A quiz will be due during the last week of classes. Each quiz is worth 10 points. Students will have two attempts for each quiz; the final quiz score will be highest score for these two attempts. The lowest 2 quiz scores will be dropped. This includes quizzes missed due to technical problems or for excused reasons such as illness. Quizzes are open notes, open book. Students are welcome to ask questions during office hours or via the course discussion board before submitting a quiz. There is NO time limit on quizzes; students can open a quiz, print out problems or save answers, and return to complete/submit the quiz at a later date. Students are encouraged to access quizzes soon after they are assigned. If a quiz is not attempted by you before the due date/time, you will not be able to view the questions (e.g. for studying/practice later).
Midterm Exam	25%	<ul style="list-style-type: none"> There will be 1 midterm exam, and 1 cumulative final exam. Students may take the exams at any point during the window noted in the Course Schedule. Students are permitted to use a calculator, one 8.5"x11" page (front and back) of self-generated notes for the midterm and two pages of notes for the final and will have 1.5 hours to complete the midterm and 2.5 hours to complete the final. Make-up exams: Students who are unable to complete an exam for a legitimate unavoidable reason may take a make-up exam only if the student provides suitable documentation. See the top of the course Moodle page for more information.
Final exam	35%	<ul style="list-style-type: none"> Exams are proctored and administered through the DELTA testing service. Students should contact DELTA Testing Services DELTA Testing Services (ncsu.edu) as soon as possible to make an appointment to take the exams at either a DELTA location or an approved remote proctor.
Total	100%	

Grading Scale: This course uses the standard NCSU letter grading scale. Percentage cutoffs are firm and no rounding occurs; for example, a percentage of 86.99 would correspond to a B.

Low(percentage)	Letter	High (percentage)
97 ≤	A+	≤ 100
93 ≤	A	< 97
90 ≤	A-	< 93
87 ≤	B+	< 90
83 ≤	B	< 87
80 ≤	B-	< 83
77 ≤	C+	< 80
73 ≤	C	< 77
70 ≤	C-	< 73
67 ≤	D+	< 70
63 ≤	D	< 67
60 ≤	D-	< 63
0 ≤	F	< 60

Late Assignments: No late work will be accepted for any reason. No quiz or discussion posting will be reopened for any reason.

Incomplete Grades are given only as specified in university regulations (<https://policies.ncsu.edu/regulation/reg-02-50-03/>).

S/U Grades are given only as specified in university regulations (<https://policies.ncsu.edu/regulation/reg-02-20-15/>).

Audits: Students who wish to audit the course with satisfactory status must register officially for the course and will be required to complete all online quizzes and discussion boards.

Attendance and Participation

- Attendance is not tracked since course content is completed asynchronously.
- Participation is tracked through the required discussion board postings and assignments. See [above](#) for more information.
- Withdrawal Process: <https://studentservices.ncsu.edu/your-classes/withdrawal/process/>

TECHNOLOGY REQUIREMENTS

Hardware: NC State's Online and Distance Education provides [technology requirements and recommendations](#) for computer hardware.

Software

- **Moodle and Wolfware**
 - [Moodle Accessibility Statement](#)
 - [Moodle Privacy Policy](#)
 - [NCSU Privacy Policy](#)
- **Adobe or Foxit Reader** (for reading PDF files)
 - [Accessibility Statement](#)
 - [Adobe Privacy Policy](#)
- **Zoom:**
 - [Zoom Accessibility Statement](#)
 - [Zoom Privacy Policy](#)
- **G Suite**
 - [Accessibility Statement](#)
 - [Privacy Policy](#)

ONLINE LEARNING EXPECTATIONS

- **Time commitment:** Students should expect at least five (5) hours a week to complete online lectures and content. Students should also set aside at least 8 hours per week to study on their own in addition to the online content. Time may vary depending on different statistics background.
- **Interaction:**
 - With your classmates: Students will interact in small groups via the required discussion postings. Communication will take place via Moodle and/or email.
 - The instructor and the TA can be reached via email or during virtual office hours.
 - Please see the above section on [Communication](#) for more information

NETIQUETTE

Netiquette is the term used to describe the special set of rules for online communication.

Students should be aware that their behavior impacts other people, even online. I hope that we will all strive to develop a positive and supportive environment and will be courteous to fellow students and your instructor. Due to the nature of the online environment, there are some things to remember.

Tips for Success:

- > **Do:** Follow the same standards of behavior that you subscribe to offline. Keep in mind that all online communication is documented and therefore permanent.
- > **Don't:** Flame others in discussion forums. Flaming is the act of responding in a highly critical, sarcastic, or ridiculing manner – especially if done on a personal level. Remember that these discussions are meant for constructive exchanges and learning!

- > **Do:** Ensure you are responding to forums by the due date, in order to leave time for peers to comment on your response.
- > **Don't:** Go for long periods of time without communicating to your instructors or classmates. It is important to stay a part of the online community!

- > **Do:** Remember to read over your posts before selecting "Submit."
- > **Don't:** Use slang, poor grammar, and other informal language in discussion forums or email messages to instructors or classmates.

Additional resources

- [**DELTA's Netiquette or Best Practices for Teaching Online**](#)
- [**Netiquette – Ethics in Computing**](#)

COURSE AND INSTITUTIONAL POLICIES

. Health and Well-Being

- Health and Well-Being Resources: These are difficult times, and academic and personal stress is a natural result. Everyone is encouraged to take care of themselves and their peers. If you need additional support, there are many resources on campus to help you:
 - Counseling Center (<https://counseling.dasa.ncsu.edu/>)
 - Health Center (<https://healthypack.dasa.ncsu.edu/>)
 -

- If the personal behavior of a classmate concerns or worries you, either for the classmate's well-being or yours, we encourage you to report this behavior to the NC State CARES team (go.ncsu.edu/NCSUcares).
- If you or someone you know are experiencing food, housing or financial insecurity, please see the Pack Essentials Program (<https://dasa.ncsu.edu/pack-essentials/>).

Academic Integrity and Honesty

- Students are required to comply with the university policy on academic integrity found in the [Code of Student Conduct](#). Therefore, students are required to uphold the university pledge of honor and exercise honesty in completing any assignment.
- Violations of academic integrity will be handled in accordance with the Student Discipline Procedures ([NCSU REG 11.35.02](#)).
- Please refer to the [Academic Integrity](#) web page for a detailed explanation of the University's policies and some of the common understandings related to those policies.

Students with Disabilities: Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with the [Disability Resource Office](#) at Holmes Hall, Suite 304, 2751 Cates Avenue, Campus Box 7509, 919-515-7653. For more information on NC State's policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation (NCSU [REG 02.20.01](#)).

Diversity Statement

- Diversity of student experiences and perspectives is essential to the deepening of knowledge in a course. I consider it part of my responsibility as an instructor to address the learning needs of all students in this course.
- It is also the responsibility of all students to exhibit professional courtesy and respect for all members of the class. The course materials and discussions are intended to be respectful of social identities. Any suggestions that you have about other ways to incorporate diverse experiences in the course materials or discussions are welcome.
- If you prefer to be called a different name and/or if your preferred pronouns are different than what are indicated on the class roster, please let me know. In scheduling midterms and other exams and major assignments, I have tried to avoid conflicts with major religious holidays. If there is a conflict with your religious observances, please let me know as soon as possible so that we can work together to make arrangements.

Basic Needs Security: Any student who faces challenges securing their food or housing or has other severe adverse experiences and believes this may affect their performance in the course is encouraged to notify the professor if you are comfortable in doing so. Alternatively, you can contact the Division of Academic and Student Affairs to learn more about the Pack Essentials program <https://dasa.ncsu.edu/pack-essentials/>

Additional Policies: Students are responsible for reviewing the NC State University Policies, Rules, and Regulations (PRRs) which pertain to their course rights and responsibilities, including those referenced both below and above in this syllabus:

- Equal Opportunity and Non-Discrimination Policy Statement
<https://policies.ncsu.edu/policy/pol-04-25-05> with additional references at <https://oied.ncsu.edu/divweb/policies/>
- Code of Student Conduct <https://policies.ncsu.edu/policy/pol-11-35-01>.

SELECTED STUDENT SERVICES

- **Academic Support**
 - **NCSU Libraries:** <https://www.lib.ncsu.edu/>
 - [Research Assistance](#)
 - [List of Subject Specialists](#)
 - [Ask a Librarian](#) - Live services from NCSU Libraries
 - [RefWorks](#) (Web-based tool to organize research); free for NCSU students
 - [Citation Builder](#) - help with APA
- [Registering for Classes](#)
- [Financial Aid](#)
- [Accessibility Support](#)
- [Online and Distance Education website](#)

TECHNICAL SUPPORT

NC State University HELP Desk:

- Website: <https://help.oit.ncsu.edu/>
- Email: help@ncsu.edu
- Phone: 919.515.HELP
- Walk-in Support Hours:

Semester	Monday-Friday	Saturday
Fall and Spring	8 a.m. to 7 p.m. After 5 p.m., please ring doorbell.	Noon to 5 p.m. Please ring doorbell.
Summer	8 a.m. to 5 p.m.	Noon to 5 p.m. Please ring doorbell.

Students can receive computer support in these areas:

- **Operating system:** Including virus and spyware removal
- **Software:** Most software packages are easy to install, but if you encounter difficulty, Walk-in Center staff are happy to help.
- **Network connectivity:** ResNet and the campus wireless network
- **Warranty and hardware repair:** For computers and warranties purchased through the NC State Bookstore
- **Unity account:** Including password resets, disabled accounts
- **2SV support:** Duo and Google two-step verification support

ELECTRONIC COURSE COMPONENTS

- Required components: Moodle, Webcam
- Optional components: Zoom
- Students may be required to disclose personally identifiable information to other students in the course, via digital tools, such as email or web-postings, where relevant to the course. Examples include online discussions of class topics, and posting of student coursework. All students are expected to respect the privacy of each other by not sharing or using such information outside the course.

COURSE EVALUATIONS

- ClassEval is the end-of-semester survey for students to evaluate instruction.
- Each semester students' responses are compiled into a ClassEval report for every instructor and class. Instructors use the evaluations to improve instruction and include them in their promotion and tenure dossiers, while department heads use them in annual reviews. The reports are included in instructors' personnel files and are confidential.
- Online class evaluations will be available for students to complete during the last two weeks of the semester for full semester courses and the last week of shorter sessions. Students will receive an email directing them to a website to complete class evaluations. These become unavailable at 8am on the first day of finals.
- Contact ClassEval Help Desk: classeval@ncsu.edu
- **[ClassEval website](#)**
- **[More information about ClassEval](#)**

This document is not a contract. I reserve the right to make changes as necessary over the course of the semester with notice.