NC STATE UNIVERSITY

ST 370 Course Syllabus, Fall 2023

Probability and Statistics for Engineers

Instructor and Teaching Assistants

Dr. Annie Booth
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Teaching Assistant
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Teaching Assistant
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Office Hours

Dr. Annie Booth: Tuesday 11 am - 12 pm, SAS Hall 5210
Wednesday 10 am - 11 am, zoom
https://ncsu.zoom.us/my/annie.booth (pwd 622343)

Rishav Chakrabarti: Thursdays 4:30 pm - 5:30 pm, zoom
https://ncsu.zoom.us/j/7301058338?pwd=czQ3V1V6TGlaUGhybXBMZEFpamU4QT09 (pwd 343704)

Swarna Chowdhury: Monday 3 pm - 4 pm, zoom
https://ncsu.zoom.us/my/swarnachowdhury (pwd 190511)

Any office hour adjustments will be announced through Moodle. If you have time conflicts with office hours, you may email me to set up an appointment outside these times.

Communication

- If you need to contact me directly, my preferred method of communication is email. When emailing me, please include "ST 370" in the subject line.
- I will use Moodle announcements for regular course communications. I recommend you set your notifications so you receive emails when announcements are posted.
- If you have a general question (one that other students could benefit from hearing or may even be able to answer) please post your question on the Moodle discussion board.
- Remember to check the syllabus and course announcements first; they may contain the answers to your questions.

Course Information

Schedule: posted separately on Moodle (subject to change)

Course Website: through Moodle (NC State Wolfware)

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Meeting Time and Location: (Section 005) 2211 Broughton Hall, T/Th 1:30 pm - 2:45 pm

(Section 006) 206 Cox Hall, T/Th 3:00 pm - 4:15 pm

Catalog Description

The class is a calculus-based introduction to probability and statistics, with a focus on collection and summary of data, along with making formal inferences and practical conclusions on the basis of data. Topics may include sampling, descriptive statistics, designed experiments, simple and multiple regression, basic probability, discrete and continuous distributions, sampling distributions, hypothesis testing, confidence intervals, one and two-way ANOVA.

Structure

The majority of this course is **synchronous**, delivered through real-time, face-to-face class sessions. Additional materials will be delivered through Moodle. Lectures will **not** be recorded. Additional insights may be offered in class which are not on the posted notes. Homeworks and quizzes will be submitted electronically through Moodle. Exams and comprehension checks will be administered in class in person. Regular attendance is essential.

Prerequisites/Corequisites

MA 241

Learning Outcomes

After successfully completing the course, students will be able to

- [ ] Construct graphical and numerical summaries of data
- [ ] Calculate probabilities using basic probability distributions
- [ ] Assess statistical inference using basic statistics
- [ ] Apply the principles of good experimental design
- [ ] Determine the appropriate analysis method for multiple data types
- [ ] Effectively communicate results from a statistical analysis

Course Materials

Textbook

Probability and Statistics for Engineering and the Sciences. Jay L. Devore. 8th or 9th edition.

This textbook is **optional**. It is a useful supplement to our course notes and a great resource for additional practice problems.

Other required materials

- [ ] Moodle
- [ ] Zoom (optional, for virtual office hours)

- ☐ Standard calculator (for in-class exams)
- ☐ R and R studio Statistical Software (details below)

Statistical Software

We will use R statistical software and the Rstudio GUI throughout this course. Some homework assignments will require submission of an Rmarkdown file. Instructions for downloading and installing R and Rstudio will be provided through Moodle.

Grading

Weight	Component	Details
20 %	Homework	6 assigned, lowest dropped, equally weighted otherwise
15 %	Quizzes	5 assigned, lowest dropped, equally weighted otherwise
15 %	Comprehension Checks	8 offered, 3 points each, grade is sum divided by 15 (max 100%)
25 %	Exam 1	Grade may be replaced with higher grade on final exam
25 %	Exam 2	Grade may be replaced with higher grade on final exam

Homework

Homeworks will be assigned about every other week (on an alternating schedule with quizzes). They are due by 12:01 pm (NOON) on the following Thursday and are to be submitted electronically through Moodle. They will include a combination of "by hand" problems and coding exercises. For hand problems, you may hand-write your solutions or type-set them in LaTeX. Submit your solutions in PDF format, and make sure the PDF pages are in chronological order. For code submissions, follow the instructions provided at the top of each homework assignment. You must write clearly and legibly and label your work with the corresponding problem number.

Homework is open-notes/open-book. You may use the textbook and lecture notes to help you complete homework exercises. Some online resources are permissible (such as using Stack Exchange posts to help with R functions) - but copying solutions from test banks or online forums is not acceptable. **You must submit your own original work.** I may randomly select a subset of the homework exercises to grade instead of grading every problem. **Late submissions will not be accepted.** Your lowest homework grade will be dropped.

Quizzes

Quizzes will be assigned about every other week (on an alternating schedule with homeworks). They are due by 12:01 pm (NOON) on the following Thursday and are to be submitted electronically through Moodle. They will include a combination of multiple choice and short answer questions.

Quizzes are open-notes/open-book, just like homeworks. Quizzes are not timed. **Late submissions will not be accepted.** Your lowest quiz grade will be dropped.

Comprehension Checks

On the days an assignment is due (most Thursdays), we will start class with a "comprehension check" quiz. The comprehension check will be a duplicate of homework/quiz question(s). I reserve the right to shuffle multiple choice questions and adjust numbers in a way that does not change the foundations of the question. These comprehension checks are designed to check that you completed and understood the assignment. They are closed-book and closed-notes. You may use a standard calculator. Each comprehension check is worth 3 points. Grade will be calculated as the sum of all points earned divided by 15 (with a maximum of 100%). Make-ups will not be considered.

Exams

There will be 2 regular semester exams, held in-person during class time on the following dates.

- Exam 1: Tuesday October 3, 2023
- Exam 2: Thursday November 30, 2023

You are permitted one note page (8.5 x 11, front and back) and a standard calculator (no cell phones). No other resources will be permitted. Makeup exams will only be considered in the case of an excused absence (https://policies.ncsu.edu/regulation/reg-02-20-03-attendance-regulations/), with adequate advance notice provided to the instructor.

There will be an optional cumulative final exam held on Tuesday December 12, 2023 at 12:00 pm (Section 005) or 3:30 pm (Section 006). Your final exam grade will replace your lowest semester exam grade (assuming it is higher).

Attendance

While attendance is not directly a component of course grades, comprehension checks and Exams (which together make up 65% of course grades) do require in-person attendance.

Grading scale

Grades will be kept to two decimal places and will NOT be rounded.

97	≤	**A+**	≤	100	73	≤	**C**	<	77
93	≤	**A**	<	97	70	≤	**C-**	<	73
90	≤	**A-**	<	93	67	≤	**D+**	<	70
87	≤	**B+**	<	90	63	≤	**D**	<	67
83	≤	**B**	<	87	60	≤	**D-**	<	63
80	≤	**B-**	<	83	0	≤	**F**	<	60
77	≤	**C+**	<	80					

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University Policies

Academic integrity and honesty

Students are required to comply with the university policy on academic integrity found in the Code of Student Conduct 11.35.01 sections 8 and 9. Therefore, students are required to uphold the Pack Pledge: "I have neither given nor received unauthorized aid on this test or assignment." Violations of academic integrity will be handled in accordance with the Student Discipline Procedures.

Please refer to the Academic Integrity web page for a detailed explanation of the University's policies on academic integrity and some of the common understandings related to those policies.

Other policies

Students are responsible for reviewing the NC State University PRR's which pertains to their course rights and responsibilities:

- Equal Opportunity and Non-Discrimination Policy Statement and additional references
- Code of Student Conduct
- Grades and Grade Point Average
- Credit-Only Courses
- Audits

Student Resources

Academic and Student Affairs maintains a website with links for student support on campus, including academic support, community support, health and wellness, financial hardship or insecurity, and more. Find Help on Campus.

Disability resources

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 (DRO). For more information on NC State's policy on working with students with disabilities, please see the Policies, Rules and Regulations page maintained by the DRO and REG 02.20.01 Academic Accommodations for Students with Disabilities.

Safe at NC State

At NC State, we take the health and safety of students, faculty and staff seriously. The Office for Institutional Equity and Diversity supports the university community by providing services and resources to support and guide individuals in obtaining the help they need. See the Safe at NC State webpage for resources.

This syllabus was updated on November 4, 2023.