

# ST 371.002 Introduction to Probability and Distribution Theory

## Fall 2020

Instructor: Dr. Jonathan P Williams

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Course website: <https://jonathanpw.github.io/ST371>

Office location: Zoom

Office hours: 11:30-13:00 Tuesdays; 13:30-15:00 Fridays; and by appointment

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Teaching Assistant: Bowen Liu

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**Course Description and Student Learning Outcomes:** Basic concepts of probability and distribution theory for students in the physical sciences, computer science, and engineering. Provides the background necessary to begin study of statistical estimation, inference, regression analysis, and analysis of variance.

**Prerequisite(s):** Calculus II.

**Credit Hours:** 3

**Text(s):** *Probability and statistics for engineering and sciences*, 9<sup>th</sup> Edition

**Author(s):** Jay Devore; **ISBN-13:** 9781305684164

### Grade Distribution:

Assignments	40%
Midterm exam 1	20%
Midterm exam 2	20%
Final exam	20%

### Letter Grade Distribution:

$\geq 93.00$	A	73.00 - 76.99	C
90.00 - 92.99	A-	70.00 - 72.99	C-
87.00 - 89.99	B+	67.00 - 69.99	D+
83.00 - 86.99	B	63.00 - 66.99	D
80.00 - 82.99	B-	60.00 - 62.99	D-
77.00 - 79.99	C+	$\leq 59.99$	F

For students taking the course as credit-only, S is equivalent to C- or better; otherwise U.

No requirements, procedures, or expectations apply to students choosing to audit the course.

**Final exam period:** 09:00 on November 18, 2020 – 09:00 on November 20, 2020.

**Personal note to students:** Please do not feel intimidated about interacting with the me. Regardless of how busy or stressed I may appear to you, teaching your class is a part of my job, and I take that very seriously. I care deeply about the quality of your learning. Please always reach out to me if you have questions, concerns, or need help. I understand that it can be difficult and

can even feel embarrassing to ask for help. However, I was once in your position, and I promise to always treat you with respect, empathy, and kindness. Nobody that ever did anything meaningful did so without first failing over and over again.

### Course policies and commentary:

- **Lectures**

- **Two 75 minute lectures will be pre-recorded each week and posted online by 23:59 on Tuesdays; view the lectures at your own convenience/pace.** The lectures will be uploaded to a shared Dropbox folder, and will remain available for the duration of the Fall 2020 semester.
- You will receive a link via your NCSU email to access the shared Dropbox folder, but you do NOT need to have a Dropbox account in order to access the folder. If you do have a Dropbox account then be careful NOT to sync the shared folder with your personal Dropbox account, unless you have adequate storage space available.

- **Assignments**

- **Homework will be assigned each Thursday evening, and will be due the following Thursday at 23:59. Completed assignments must be scanned, converted to .pdf format, and emailed to the instructor (jwilli27@ncsu.edu).**
- Each homework assignment will receive the same weight in the calculation of the final course grade (i.e., longer (shorter) assignments do not count for a larger (smaller) portion of the overall assignment course grade). For each assignment, each exercise will receive 2 points of credit if the solution is correct, 1 point the solution is mostly correct, and 0 points of credit otherwise. Only a random selection of exercises will be graded for each assignment.
- No late assignments will be accepted. Reach out to the instructor if you begin to fall behind!
- Take responsibility for understanding solutions to all assignments. For example, if you find a solution on StackExchange, then convince yourself that the solution is actually correct.
- **Learn to distinguish between the things you *do* know and the things you *do not* know** (this is one of the most important results of all education). To understand, to *a* particular degree, that a given statement is true means that you can explain why the statement is true, to *the* particular degree.

- **Exams**

- Tentatively, all exams are take-home, and you will have 48 hours to complete, scan, and return. Any communication with other students is strictly prohibited during exams.
- A study guide will be provided by the instructor prior to each exam.

### Tentative Course Outline:

Week	Content
Week 1	<ul style="list-style-type: none"><li>• Descriptive statistics</li><li>• Chapter 1 from Devore</li></ul>
Week 2	<ul style="list-style-type: none"><li>• Descriptive statistics</li><li>• Chapter 1 from Devore</li></ul>
Week 3	<ul style="list-style-type: none"><li>• Probability</li><li>• Chapter 2 from Devore</li></ul>
Week 4	<ul style="list-style-type: none"><li>• Probability</li><li>• Chapter 2 from Devore</li></ul>
Week 5	<ul style="list-style-type: none"><li>• Discrete random variables and probability distributions</li><li>• Chapter 3 from Devore</li></ul>
Week 6	<ul style="list-style-type: none"><li>• Discrete random variables and probability distributions</li><li>• Chapter 3 from Devore</li><li>• <b>Midterm 1 – Monday, September 14, 2020</b></li></ul>
Week 7	<ul style="list-style-type: none"><li>• Discrete random variables and probability distributions</li><li>• Chapter 3 from Devore</li></ul>
Week 8	<ul style="list-style-type: none"><li>• Continuous random variables and probability distributions</li><li>• Chapter 4 from Devore</li></ul>
Week 9	<ul style="list-style-type: none"><li>• Continuous random variables and probability distributions</li><li>• Chapter 4 from Devore</li></ul>
Week 10	<ul style="list-style-type: none"><li>• Continuous random variables and probability distributions</li><li>• Chapter 4 from Devore</li></ul>
Week 11	<ul style="list-style-type: none"><li>• Joint probability distributions and random samples</li><li>• Chapter 5 from Devore</li><li>• <b>Midterm 2 – Monday, October 19, 2020</b></li></ul>
Week 12	<ul style="list-style-type: none"><li>• Joint probability distributions and random samples</li><li>• Chapter 5 from Devore</li></ul>
Week 13	<ul style="list-style-type: none"><li>• Point estimation</li><li>• Chapter 6 from Devore</li></ul>
Week 14	<ul style="list-style-type: none"><li>• Point estimation</li><li>• Chapter 6 from Devore</li></ul>

**NCSU Policies, Regulations, and Rules:** 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>
- Grades and Grade Point Average <https://policies.ncsu.edu/regulation/reg-02-50-03>
- Credit-Only Courses <https://policies.ncsu.edu/regulation/reg-02-20-15>
- Audits <https://policies.ncsu.edu/regulation/reg-02-20-04>

**Policy on Academic Integrity:** Cheating, plagiarism and other forms of academic dishonesty will not be tolerated. Violations of academic integrity will be handled in accordance with the Student Discipline Procedures (NCSU REG 11.35.02).

**Disability Services for Students:** 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).

**Privacy:** 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.