Syllabus for STAT 4201: Introduction to Mathematical Statistics I
Spring 2026 – 4 credit hours

Instructor: Dr. Andrew Richards
BS, Physics, U.S. Naval Academy
MBA, Yale School of Management
PhD, Statistics, The Ohio State University
Office: Cockins Hall 325
Office Hours: MWF 1:15-2:15 and by appointment
E-mail: richards.1227@osu.edu **not buckeyemail**
TAs: Chenze Li, Li.13074@buckeyemail.osu.edu; Tony Fan, Fan.1317@buckeyemail.osu.edu; and Qian Zhou, Zhou.3132@buckeyemail.osu.edu.

Course meeting times and locations: Lecture: MWF 3:00-3:55pm in Fontana 1000; Recitation W 4:10-5:05, W 5:20-6:15, or R 4:10-5:05; all in Pomerene 250.

Prereq: Prereq: C- or better in Math 2153, 2162.xx, 2182H, or 4182H, or permission of instructor. Not open to students with credit for 3201, 4202, 6201, 6301, 6801, Math 4530 or 5530H.

Required Text: *John E. Freund's Mathematical Statistics with Applications*, 8th edition, by Irwin Miller and Marylees Miler, Pearson, 2014

The textbook for this course is being provided via CarmenBooks. Through CarmenBooks, students obtain publisher materials electronically through CarmenCanvas. The fee for this material is included as part of tuition and is listed as CarmenBooks fee on your Statement of Account. Materials provided through CarmenBooks are available immediately on or before the first day of class.

Unless you choose to opt-out of the program, you do NOT need to purchase any materials for this course at the bookstore. For more information on the program or information on how to opt out, please visit the CarmenBooks website.

Access this eBook through the CarmenBooks reader link in the course navigation.

Website: Please visit `http://www.carmen.osu.edu/`. Carmen is used extensively for this course, so you should check daily for announcements about the class and other class material. Contact the IT Service Desk at 614-688-4357 (HELP) for help with access.

Course Description: This is the first course in a two-semester sequence on probability and mathematical statistics. The focus of STAT 4201 will be on introducing some of the basic concepts in probability theory. Topics to be covered include basic counting, set theoretic notation, the axioms of probability spaces, discrete and continuous distributions and densities, random variables, expectation and moments, functions of random variables and transformation techniques, common sampling distributions, and order statistics. These topics are covered in the first 8 chapters of the required textbook.

Learning Outcomes: By the end of this course, students should successfully be able to:

- Understand the basic concepts in probability and statistics.
- Compute probabilities and statistics of discrete and continuous distributions.

- Comprehend the probabilistic methods needed to analyze and critically evaluate statistical models and arguments.
- Recongnize the importance of statistical ideas.

Homework:
Description: There will be ten homework assignments. They will consist of mostly textbook problems, with some additional problems motivated by real-world applications. Homework must be uploaded to Carmen by the due date. The solutions may be handwritten and scanned, entered directly into a tablet, or typed. **All work and software output must be uploaded as a single pdf file.**

Academic integrity and collaboration: The purpose of the written homework is to assess and provide feedback on your understanding of and ability to explain the reasoning behind complex derivations or probabilistic arguments. **Therefore, answers with little or no explanation or work shown will receive no credit.** For the homeworks as well the exams, your solution should be clear and detailed to explain your understanding of the course.

While grading the homeworks, it may not be possible for us to provide detailed explanations on each question that is graded. To make up for this, I will endeavor to create homework solutions that are detailed enough to allow you to understand how the question could be approached. You may consult with other students, however, the **work submitted must be your own.**

Recitation lab activities:
Description: Weekly lab activities will be completed in recitation. **Attendance in lab is mandatory to receive credit for the lab.** These are designed so you can work on difficult problems together and under the guidance of your TA. These problems will be designed to run the range from simpler problems for gaining experience to challenging problems that may exceed the difficulty of exam questions.

Academic integrity and collaboration: You are encouraged to work together with your fellow students and seek help from your TA.

Exams:
Description: There will be three midterm exams and one final exam. The midterms will be held during lecture on the dates listed in the schedule.

Academic integrity and collaboration: You must complete the midterm and final exams yourself, **without any external help or communication.** Sharing of any items such as calculators or formula sheets is **prohibited**. Use of a calculator or any other internet-connected device during the exam is **strictly prohibited.** Again, answers with little or no explanation or work shown **will receive no credit**. Students are **strongly advised** to prep a formula highlight sheet in advance.

Late assignments policy:
Assignment solutions will be posted shortly after the submission deadline. No late assignments will be accepted without **prior permission** and/or **formal documentation**. Please refer to Carmen for due dates. Accommodations can be made in case of severe illness, so please notify me as soon as possible if this situation arises. Deadlines are crucial in order, among other things, to:

- Get grading done and provide feedback in a timely manner
- Grade all assignments at the same time to maintain consistency and fairness

- Provide a mechanism to help ensure students keep up with the material and are prepared for follow-on lectures
- Protect students from their inability to predict their own future behavior – "I'll somehow manage to catch up at the end of the semester."

Course attendance policy: You are expected to attend all lectures. I will take attendance at lecture, and students are responsible for all material covered in class. I intend to simulcast lectures on zoom for students who are sick, but **I will not record lectures or provide annotated notes**. Students should keep all electronics closed during class with the exception of taking notes on a tablet. Students who persist in using cell phones or laptops in class **will be asked to leave.** Office hours should not be used for instruction on material that has already been covered in class.

Course technology: Students are expected to have a basic working knowledge of The Microsoft Office software. All Ohio State students are now eligible for free Microsoft Office 365. Visit the `go.osu.edu/office365help` help article for full instructions.

Final Grade: Your final course grade will be based on the following weighting of assessment components:

Category	Percentage
Homework	15
Lab	15
Exam 1	15
Exam 2	15
Exam 3	15
Final exam	25
Total	100

Grading Scale:
Grades will be assigned according to the scale below, with course components weighted as listed above.

93-100 = A
90-92.9999 = A-
87-89.9999 = B+
83-86.9999 = B
80-82.9999 = B-
77-79.9999 = C+
73-76.9999 = C
70-72.9999 = C-
67-69.9999 = D+
60-66.9999 = D
< 60 = E

E-mail Correspondence: In order to protect your privacy, all course email correspondence must be done through a valid OSU name.nn account. Please use the correct email address. (Richards.1227@osu.edu **not** @buckeyemail.osu.edu). Please write "STAT 4201" somewhere in the subject line, as this will help me to quickly identify and reply to class emails. It is reasonable to expect a response within one business day.

Other information: Standard university policies regarding academic misconduct, disability accommodations, and religious accommodations, among other topics, can be found here: `https://ugeducation.osu.edu/academics/syllabus-policies-statements`.

Disclaimer:
The planned instruction for this course may be disrupted for a number of reasons. Such disruptions may affect individual students for a brief period of time, the entire class, the instructor, or the entire university. If the class is disrupted, we will adjust as needed. The adjustments may include changes to course delivery, assignments, grading of assignments, and determination of final course grade. Please pay special attention to announcements in class and over Carmen. **Failure to address every possible scenario in this syllabus does not override your responsibility to exercise basic common sense. If in doubt about any course policy, ask in advance!**

Acknowledgemnt:
Thank you to Dr. David Sivakoff for his kind sharing of advice and course materials in preparation for this semester.

Tentative Course Schedule

Week	Dates	Topics, (Chapters), Holiday, Homework, and Exam Dates
1	1/12-1/16	Intro, combinatorics, probability axioms. (1-2)
2	1/19-1/23	Conditional probability and Bayes Theorem. (2) **MLK Day 1/19, HW1 1/23**
3	1/26-1/30	Random variables and CDFs. (3) **HW2 1/30**
4	2/2-2/6	Joint and conditional distributions. (3) **HW3 2/6**
5	2/9-2/13	Expected value. (4) **MT1 2/9**
6	2/16-2/20	Moments, MGFs, covariance. (4) **HW4 2/18**
7	2/23-2/27	Conditional expectation, discrete distributions. (4-5) **HW5 2/25, MT2 2/27**
8	3/2-3/6	Binomial, hypergeometric, and geometric distributions. (5)
9	3/9-3/13	Poisson, exponential, gamma, and beta distributions. (5-6) **HW6 3/11**
10	3/16-3/20	**SPRING BREAK**
11	3/23-3/27	Normal distribution. (6)
12	3/30-4/3	Intro to transformations. (7) **HW7 3/30, MT3 4/1**
13	4/6-4/10	Transformations and sampling distributions. (7-8)
14	4/13-4/17	CLT, finite populations, χ^2. (8) **HW8 4/13**
15	4/20-4/24	T and F distributions; order statistics. (8) **HW9 4/20**
16	4/27	Review. **HW10 4/27**

FINAL EXAM: Friday, May 1, 4:00-5:45pm in our regular classroom.