

Probability MA 485/585-1C Fall 2022

The class meets on Mon/Wed/Fri from 10:10am to 11:00am in Room HHB 126

Instructor: Dr. Gunter Stolz

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Office hours: Send email to stolz@uab.edu to set up an appointment on Zoom (preferred) or in person. Provide a couple of possible times.

There is **NO required textbook** for this course. Instead, a full set of **Lecture Notes** in pdf-format, written originally by N. Chernov and slightly modified, will be used and is available on the CANVAS page of this course.

Grading policy: Of the following two schedules the one that yields the better grade will be applied.

Homework	20 %	or	0 %
Midterm Test I (tentatively September 30)	25 %		30 %
Midterm Test II (tentatively November 2)	25 %		30 %
Final Exam (Friday, Dec 9, 8:00am to 10:30am)	30 %		40 %

Homework:

- Weekly homework sets will be posted as assignments on CANVAS and will usually be due within one week. Answers to the homework problems, **including full solutions**, need to be turned in on the due date by 11:59pm via Canvas. Corrected and graded HW will be returned within one week.
- No late homework is accepted.
- Homework is **not mandatory**. If you turn in the HW regularly and the schedule #1 above gives you a better grade, it will be automatically applied. Otherwise, your HW scores (if any) will be dropped and the schedule #2 will be applied. It is advised that, as a preparation for the tests, you do homework as often as possible and have it graded, even if you cannot do it regularly for credit.
- Exercises marked as ‘Bonus’ and ‘Graduate’ can be attempted for extra credit and can thus be used to make up for missed credit on other exercises.

Tests: All tests and the final exam are open-notes. Sample tests will be provided beforehand. You may use a calculator, and most likely you will need one, so bring one

with you. You may also use a phone, laptop or a tablet without internet connection (Wi-Fi switched off, airplane mode).

Course Grade: Your course grade will be determined as follows: $A = 88 - 100$, $B = 75 - 87$, $C = 62 - 74$, $D = 50 - 61$

To MA 585 students:

- You are taking this course at the graduate level!
- As an extra requirement, you will need to do the homework exercises marked as Graduate (some of them require reading Chapter 19 from the class notes, which is marked for graduate students). Unlike for MA 485 students, the graduate exercises are a **mandatory** component of the class for MA 585 students and will count for 15% of your course grade (with your score on schedule #1 or #2 above re-scaled to 85%). I will allow you to skip up to 20 percent of the graduate exercises and still receive the full 15% contribution to your grade.
- The graduate homework problems can be turned in at any time before (or on) Friday, December 2. They need to be turned in **on paper in class**. Please, don't turn in all of them on the last possible day to make grading easier for me.
- The tests and final exam are identical for MA 485 and MA 585 (without extra requirements for graduate students).

Syllabus and tentative schedule

Chapter of Lecture Notes	Tentative Dates
1. Combinatorics	8/22, 8/24, 8/26
2. Probability space	8/29, 8/31
3. Conditional probability and independence	9/2, 9/7, 9/9
4. Discrete random variables	9/12, 9/14, 9/16
5. Continuous random variables	9/19, 9/21, 9/23
6. Exponential random variables	9/26, 9/28
Test - 1 (covers sections 1–5)	Fri 9/30
7. Functions of random variables	10/3, 10/5
8. Normal random variables	10/7, 10/10, 10/12
9./10. Double Integrals/Joint distributions	10/14, 10/17, 10/19
11. Mean value	10/21, 10/24, 10/26
12. Variance	10/28, 10/31, 11/4
Test - 2 (covers sections 6–11)	Wed 11/2
13. More on Variance	11/7, 11/9, 11/11

14. Covariance and correlation	11/14, 11/16, 11/18
15. Law of Large Numbers	11/28
16. Central Limit Theorem	11/30, 12/2

The **Final Exam** is scheduled for **Friday, December 9, 8:00am to 10:30am**. It covers sections 12 to 16 as well as background material from sections 1 to 11 required to work problems from the later sections.

- **Regular class attendance is important and strongly encouraged.** The instructor will follow the lecture notes (but occasionally include different or additional examples), so if you have to miss a class, study the notes thoroughly and ask a fellow student what was covered in class.
- This syllabus, the lecture notes for the course, as well as homework assignments with due dates are made available on the CANVAS page of this course (all in the ‘Files’ directory). While I will try to send reminders about homework being due, it is your responsibility to regularly check for updated postings on CANVAS.
- If you would like to use a book, in addition to the lecture notes, you can buy one or check one out from a library. Here are suggested books:

S. Ross, *A First Course in Probability*, Prentice Hall, or

S. Ghahramani, *Fundamentals of Probability, with Stochastic Processes*, Prentice Hall.

The former is simpler and more elementary, the latter is more sophisticated. A free online textbook by Marcel Finan, covering topics similar to Ross with many worked examples and sample exams, is available at

<https://faculty.atu.edu/mfinan/actuarieshall/PV2020.pdf>

You can also find this book in the ‘Files’ directory on CANVAS.

Academic Misconduct:

UAB Faculty expects all members of its academic community to function according to the highest ethical and professional standards. Academic dishonesty and misconduct includes, but is not limited to, acts of abetting, cheating, plagiarism, fabrication, and misrepresentation. Students are expected to honor the UAB Academic Code of Conduct as detailed in the most current UAB Policies Guide. Please consult these resources for additional information regarding the specific procedures to be undertaken when a student violates the UAB Academic Code of Conduct.

- <https://www.uab.edu/students/one-stop/policies/academic-honor-code>
- <https://www.uab.edu/engineering/home/students/code-of-conduct#academic>

DSS Accessibility Statement:

UAB is committed to providing an accessible learning experience for all students. If you are a student with a disability that qualifies under Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act, and you require accommodations, please contact Disability Support Services for information on accommodations, registration and procedures. Requests for reasonable accommodations involve an interactive process and consist of a collaborative effort among the student, DSS, faculty and staff. If you are registered with Disability Support Services, please contact DSS to discuss accommodations that may be necessary in this course. If you have a disability but have not contacted Disability Support Services, please call 934-4205 or visit <http://www.uab.edu/dss> or Hill Student Center Suite 409.

Title IX Statement:

The University of Alabama at Birmingham is committed to providing an environment that is free from sexual misconduct, which includes gender-based assault, harassment, exploitation, dating and domestic violence, stalking, as well as discrimination based on sex, sexual orientation, gender identity, and gender expression. If you have experienced any of the aforementioned conduct we encourage you to report the incident. UAB provides several avenues for reporting. For more information about Title IX, policy, reporting, protections, resources and supports, please visit <http://www.uab.edu/titleix> for UAB's Title IX Policy, UAB's Equal Opportunity, Anti-Harassment Policy and Duty to Report and Non-Retaliation Policy.