Course Subject, Number and Title
MATH 431 – Introduction to the theory of probability

Credits
3

Meeting Time and Location
MWF, 2:25–3:15pm, Van Vleck B115

Instructor Title and Name
Prof. Shaoming Guo

Instructor Availability
Tuesdays 2–3pm, Wednesdays 10:30–11:30

Instructor Email/Preferred Contact
shaomingguo@math.wisc.edu
contact by email

Teaching Assistant name
Theodore Montalbano

TA availability
Tuesday 3–6pm, and Friday 3–4pm, in B205 Van Vleck.
OFFICIAL COURSE DESCRIPTION

Official Course Description
Math 431 is an introduction to the theory of probability, the part of mathematics that studies random phenomena. We model simple random experiments mathematically and learn techniques for studying these models. Topics covered include axioms of probability, random variables, the most important discrete and continuous probability distributions, expectations, moment generating functions, conditional probability and conditional expectations, multivariate distributions, Markov's and Chebyshev's inequalities, laws of large numbers, and the central limit theorem.

Requisites
To be technically prepared for Math 431 one needs to be comfortable with the language of sets and calculus, including multivariable calculus, and be ready for abstract reasoning. It is also important to be familiar with the basic techniques of counting (we will review these along the way).

LEARNING OUTCOMES
Course Learning Outcomes
To get familiar with axioms of probability, random variables, the most important discrete and continuous probability distributions, expectations, moment generating functions, conditional probability and conditional expectations, multivariate distributions, Markov's and Chebyshev's inequalities, laws of large numbers, and the central limit theorem.

GRADING
30% (homework & Quizzes) + 35% Max{Mid-term I, Mid-term II}+ 35% Final exam
the final grades will be curved; attendance will not be part of the grading.

DISCUSSION SESSIONS
There will be no discussion session. If you have any question, please ask me during office hours.

REQUIRED TEXTBOOK, SOFTWARE & OTHER COURSE MATERIALS
Introduction to Probability, by David Anderson, Timo Seppalainen, and Benedek Valko.

EXAMS, QUIZZES, PAPERS & OTHER MAJOR GRADED WORK
FIRST MID-TERM EXAM: Friday, 18. October
SECOND MID-TERM EXAM: Monday, 18. November
FINAL: 17. December, 10:05am–12:05 pm.

HOMEWORK & OTHER ASSIGNMENTS
Homework will be announced through Canvas. Homework will be collected every week on Wednesday. Homework questions will NOT be answered during office hours before due date.
Generally speaking, NO late homework will be accepted. The lowest homework score will be dropped.

Observe rules of academic integrity. Handing in plagiarised work, whether copied from a fellow student or off the web, is not acceptable. Plagiarism cases will lead to an “F” for this course. There may also be other penalties.

Working in groups on homework assignments is strongly encouraged; however, every student must write their own assignments. Moreover, if you work in a group, you MUST put the names of other group members on your homework. Otherwise it will be considered as plagiarism.

Organise your work neatly. Use proper English. Write in complete English or mathematical sentences. Answers should be simplified as much as possible.

Put problems in the correct order and staple your pages together.

You are strongly encouraged to type up your solutions (perhaps using Latex).

RULES, RIGHTS & RESPONSIBILITIES

• To see the Guide’s Rules, Rights and Responsibilities information, refer to http://guide.wisc.edu/undergraduate/#rulesrightsandresponsibilitiestext.

ACADEMIC INTEGRITY

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison’s community of scholars in which everyone’s academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review. For more information, refer to studentconduct.wiscweb.wisc.edu/academic-integrity/.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

McBurney Disability Resource Center syllabus statement: “The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty [I], will work either directly with the student [you] or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA.” http://mcburney.wisc.edu/facstaffother/faculty/syllabus.php

DIVERSITY & INCLUSION

Institutional statement on diversity: “Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion
enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals.

The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world." [https://diversity.wisc.edu/](https://diversity.wisc.edu/)