

Syllabus

STAT 516 Fall 2025

Basic Probability and Applications

Instructor: Professor Michael Levine

Time and Location: TTh, 1.30pm-2.45pm, SCHM 114

Instructional Modality: in-class lectures

Course Credit Hours: 3

CRN: 27480

Office Hours: Tuesday and Thursday, 3pm-4pm, MATH 216 (my office).

Contacting the instructor: the best way to contact me is by e-mail. Emails are read every day, and will be responded to within 24 hours. Be flexible with these times before deadlines and exams

Phone: (49)6-7571

Email: mlevins@purdue.edu

Prerequisites: MA 261 (Multivariate Calculus), 172, or equivalent

Textbook: Fundamentals of Probability: a first course by A. DasGupta. You can download this textbook from the library website free of charge.

Approximate Course Coverage:

1. Equally likely outcomes, probability rules, conditional probability and independence
2. Discrete random variables and discrete distributions
3. Generating functions and standard discrete distributions
4. Continuous random variables and some special univariate continuous distributions
5. Normal distribution, normal approximations, and Central Limit Theorem
6. Multivariate discrete distributions
7. Multidimensional densities, convolutions, and transformations
8. Dependence; conditional distributions and expectations; covariance and correlation; bivariate normal.

Objective: By the end of this course, students should be comfortable with probability distributions and random variables. They are also expected to master many of the distribution finding techniques, such as transformation and moment generating methods, know a number of specific

distributions (e.g. Bernoulli, Binomial, Poisson, Normal, t-, F-distributions etc.), and understand order statistics, law of large numbers and the central limit theorem.

Lectures: The online notes will be made available to you on the course Brightspace web page.

Final Grade: Your final grade will be based on the following components: homework (35%), midterm (35%), and final exam (30%). The percentage grades needed to achieve an A, B, C, or F will follow approximately the following scale: 85 – 100 = A, 70 – 84 = B, 55 – 69 = C, 40 – 54 = D, anything below 40 means F.

Examinations: There will be one midterm examination and one final examination. The midterm is an in-class exam that will take place on Tuesday, September 30th. The final examination will not be cumulative and will be two hours long; its exact date will be announced later. The exams are closed book/open note. You are allowed to write/type on both sides of two cheat sheets of the usual 8.5”by 11” size. Contact me as soon as possible if you are unable to take an exam at the scheduled time. Students having exam conflicts or requesting special accommodations (these should be documented) must inform me as early as possible so that alternative plans may be arranged. It is YOUR responsibility to contact me IN ADVANCE to check if a make-up is possible. Please have a calculator with you at either exam.

Rules of Politeness:

1. No eating or drinking in class! Also, no texting, IM’ing etc. during the class.
2. Barging in late into the class is very disruptive and rude. Please try to be on time for class as much as possible.

Homework: The homework will be assigned approximately one week before its due date and will also be posted on the course Brightspace web page. The homework must be finished (written) independently. Discussion is okay, but identical copies are not acceptable since your homework must reflect YOUR understanding of the material. If identical solutions are found, all the parties involved will receive a 0 on that assignment. Late homework will not be accepted under any circumstances (late = after 5pm on the day of the class meeting). Usually, homework solutions will be posted on the class web page shortly after the due time. To allow for illness, family emergencies, etc., two lowest homework scores will be dropped at the end of the fall semester. The homework should be uploaded to the course Brightspace page; each homework will be a separate Brightspace assignment. I prefer that you write your homework assignment in LaTeX and turn it into PDF file before uploading. If you don’t know LaTeX, feel free to use e.g. Microsoft Word for the same purpose.

Attendance: Classroom engagement is extremely important and associated with your overall success in the course. I will not be taking attendance but keep in mind that attending classroom meetings regularly and participating in discussions is in your own interests. Please also keep in mind that students need to inform the instructor of any conflict that can be anticipated and will affect the timely submission of an assignment or the ability to take an exam. When conflicts can

be anticipated, such as for many University-sponsored activities and religious observations, the student should inform the instructor of the situation as far in advance as possible. In such cases, documentation will also be requested. For unanticipated or emergency conflicts, when advance notification to an instructor is not possible, the student should contact the instructor as soon as possible by email, through Brightspace, or by phone. In cases of bereavement, quarantine, or isolation, the student or the student's representative should contact the Office of the Dean of Students via [email](#) or phone at 765-494-1747. Our course Brightspace includes a link to the Dean of Students under 'Campus Resources.'

Academic Dishonesty: Penalties for academic misconduct range from a 0 on the assignment to failure in the course with referral to the Dean of Students for further sanctions. Note that we punish not only the person who cheats but also the person who enables the cheater.

Remember that academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either emailing integrity@purdue.edu or by calling 765-494-8778. While information may be submitted anonymously, the more information is submitted the greater the opportunity for the university to investigate the concern.

Nondiscrimination Statement: Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages everyone to strive to reach his or her potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life.

Grief Absence Policy for Students: Purdue University recognizes that a time of bereavement is very difficult for a student. The University therefore provides the following rights to students facing the loss of a family member through the Grief Absence Policy for Students (GAPS). GAPS Policy: Students will be excused for funeral leave and given the opportunity to earn equivalent credit and to demonstrate evidence of meeting the learning outcomes for missed assignments or assessments in the event of the death of a member of the student's family.

Students with Disabilities: Purdue University is required to respond to the needs of the students with disabilities as outlined in both the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 through the provision of auxiliary aids and services that allow a student with a disability to fully access and participate in the programs, services, and activities at Purdue University. It is the student's responsibility to notify the Disability Resource Center of an impairment/condition that may require accommodations and/or classroom modifications. University wide disability resources can be found at <http://www.purdue.edu/odos/drc>

How to deal with stress:

1. If you find yourself beginning to feel some stress, anxiety and/or feeling slightly overwhelmed, try WellTrack, <https://purdue.welltrack.com/>. Sign in and find information and tools at your fingertips, available to you at any time.
2. If you need support and information about options and resources, please see the Office of the Dean of Students, <http://www.purdue.edu/odos>, for drop-in hours (M-F, 8 am- 5 pm).
3. If you're struggling and need mental health services: Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help, such individuals should contact Counseling and Psychological Services (CAPS) at (765)494-6995 and <http://www.purdue.edu/caps/> during and after hours, on weekends and holidays, or by going to the CAPS office of the second floor of the Purdue University Student Health Center (PUSH) during business hours.

Emergencies: in the event of a major campus emergency or other circumstances beyond the instructor's control, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar. Relevant changes to this course will be posted onto the course website; you can also e-mail me at mlevins@purdue.edu with any questions you may have if/when this happens.