

STAT 230: Introduction to Probability and Statistics

Course Syllabus (2022–2023 Fall; Section 3, MWF 1pm–2pm)

Summary: Statistics is the science of extracting reliable information from empirical data. Probability Theory is the mathematics of reasoning about chance and randomness. Although these are two distinct disciplines, they are inherently intertwined. This course is an introduction to probability theory and statistics for students of engineering, computer science and natural sciences. It is calculus-based in that the students are assumed to be comfortable with the concepts and techniques of calculus such as limits, (partial) derivatives and (multiple) integration. It is also calculus-styled meaning that its emphasis is on modeling, conceptual understanding and problem solving rather than on mathematical rigor.

Prerequisite: MATH 201

Textbook:

- Lecture notes will be posted on Moodle.
- Optional: *Probability and Statistics for Engineering and the Sciences* (9th ed.), by J. Devore (roughly Chapters 1–8)
- Extra: *Elementary Probability for Applications*, by R. Durrett
- Extra: *Introduction to Probability and Statistics for Engineers and Scientists*, by S. Ross

Note: The electronic versions of the last two books can be accessed via the [university library](#). You may be prompted to login with your AUB account.

Tentative Course Outline:

- Basic descriptive statistics
- Mathematical language of probabilities
- Counting techniques and their applications in probability
- Dependence and conditional probabilities
- Discrete and continuous random variables; their individual and joint distributions
- Expected value and variance of random variables and their covariance and correlation
- Important classes of random variables
- Bernoulli and Poisson processes
- Law of large numbers
- Central limit theorem
- Point estimation
- Confidence intervals (classical interval estimation; based on large or small samples)
- Statistical hypothesis testing (classical significance tests; based on large or small samples)

Instructor: Siamak Taati (Email: st71@aub.edu.lb; Office: Bliss Hall 312B)

Office hours:

- Mondays and Wednesdays 2:00pm–3:00pm (tentative; to be updated at the beginning of the semester)

Coursework:

- **Class participation.** You are expected to attend every class, and to actively participate in class discussions.
- **Assignments.** There will be biweekly assignments consisting of short tasks on Moodle, which you will have to complete before the set deadlines. These will not directly contribute to the final grade, but *in order to qualify for the final exam, you must complete at least 80% of the tasks in time.*
- **Quizzes.** There will be short in-class quizzes every two weeks on Fridays (5 or 6 in total). The quiz will be held during the last 15min of the class and will include questions about the recently covered materials. Your final quiz grade will be the average of your 4 best quiz grades.

Grading Policy: The term grade will be calculated in two ways and the higher grade will be used.

- Assignments: 0% (you are required to complete at least 80% to be eligible for the final exam)
- Quizzes: 40% or 60% (average of the best 4 quizzes; absence counts as zero)
- Final exam: 60% or 40% (covering all the course materials)

Unique Learning Needs of Students with Disabilities: AUB strives to make learning experiences as accessible as possible. If you anticipate or experience academic barriers due to a disability (including mental health, chronic or temporary medical conditions), please inform your lecturer immediately so that we can privately discuss options. In order to help establish reasonable accommodations and facilitate a smooth accommodation process, you are encouraged to contact the Accessible Education Office: accessibility@aub.edu.lb; +961-1-350000, x3246; West Hall, 314.

Academic Integrity: Please refer to AUB [Student Code of Conduct](#), in particular to section 1.1, which concerns academic misconduct including cheating, plagiarism, in-class disruption, and dishonesty. Please be aware that misconduct is vigorously prosecuted and that AUB has a zero tolerance policy. Course policy is that credible evidence of cheating will result in course failure.

Non-Discrimination: AUB is committed to facilitating a campus free of all forms of discrimination including sex/gender-based harassment prohibited by Title IX. The University's non-discrimination policy applies to, and protects, all students, faculty, and staff. If you think you have experienced discrimination or harassment, including sexual misconduct, we encourage you to tell someone promptly. If you speak to a faculty or staff member about an issue such as harassment, sexual violence, or discrimination, the information will be kept as private as possible, however, faculty and designated staff are required to bring it to the attention of the University's Title IX Coordinator. Faculty can refer you to fully confidential resources, and you can find information and contacts at [<https://www.aub.edu.lb/president/titleix>]. To report an incident, contact the University's Title IX Coordinator Trudi Hodges at 01-350000 ext. 2514, or titleix@aub.edu.lb. An anonymous report may be submitted online via EthicsPoint at [<http://www.aub.ethicspoint.com>].