MATH 3170 - Elementary Stochastic Processes
Spring 2026

https://alexander-teplyaev.uconn.edu/math-3170-spring-2026/

- **Instructor:** Alexander (Sasha) Teplyaev,
  https://alexander-teplyaev.uconn.edu/
- **Office hours:**

  Monday, Wednesday and Friday 1:30pm-2:30pm and by appointment.

  (***Please email me in advance if the meeting is important or time sensitive***.)

  Office: MONT 429, email: teplyaev@uconn.edu
- **Textbook:** Essentials of Stochastic Processes by Richard Durrett. The free Version 3.9, May 2021 of the textbook is available online on the authors webpage. This particular free version will be used in class.
- **Quizzes, Tests and Exams:**
  * **There will be in class and/or take-home quizzes about every other week.**
  * **Each test or quiz will be announced at leas a week in advance.**
  * **There will be a mid-term test after the Spring Break.**
  * **Final Exam during the final exam week: tba**
  * **Extra credit problems will be provided.**

No make-up quizzes or tests will be offered. If you can not come to class for a test or a quiz, please provide an explanation by email, preferably in advance. Your grade will be pro-rated.

Grading Policy

Numerical Components

The course grade is based on the following components:

- Final examination: 30%
- Midterm examination: 20%
- Quizzes: 50%

There are seven quizzes in total. The lowest two quiz scores are dropped, and the remaining five quizzes are used to compute the quiz average.

Assignment of Letter Grades

Cluster analysis will be performed according to the following principles:

- The top 16 or more students in the course receive a grade of A.
- The next group of students, whose performance forms a cluster close to the top group, receive a grade of A−.
- Most remaining students receive a grade of B+ or B.
- Grades of B−, C+, and C are assigned on a case-by-case basis, taking into account overall performance and individual circumstances.

If the Husky grade is higher than the letter grade computed above using cluster analysis, the Husky grade will be assigned as the final course grade.

The instructor retains discretion in assigning final letter grades in order to ensure fairness and consistency across the class.

- **Homework:** Assignments will be posted in HuskyCT and/or on the webpage https://alexander-teplyaev.uconn.edu/math-3170-spring-2026/
  Assigned problems, possibly in modified form, are subject to appear in the quizzes and/or the exams.
  The HW will not be collected and graded.
- **Look at the Academic Calendar** for all the important dates in the semester.
- **Prerequisites:** Calculus, up to and including series, limits, partial differentiation, and multiple integration. Recall that MATH 2110Q, 2130Q or 2143Q, and especially MATH 3160, are strictly enforced as a prerequisite for MATH 3170.

  The **final exam date** will be announced by the registrar a few weeks into the semester. You MUST contact the Dean of Students Office (DSO) regarding any conflict with the scheduled final exam times by the end of the third-from-last week of the semester.
- **Course preparation:** To keep up with the course, you will need to spend 2+ hours studying on your own for each class meeting. Work on the corresponding homework problems: this is especially important in the last 2/3 of the course, where the *new material builds upon the previous material.*
- **The Student Code:** Everyone is expected to read and abide by the UConn Student Code, especially Appendix A: Academic Integrity in Undergraduate Education and Research. Any academic misconduct will be dealt with under this policy.

Standard syllabus for Math 3160 Probability:

Good sources on probability are open source textbooks, such as http://probability.oer.math.uconn.edu/3160-oer/ and Introduction to Probability by Charles M. Grinstead and J. Laurie Snell. There are many published textbooks, such as *A First Course in Probability*, 7th/8th/9th Ed., by Sheldon Ross.

- **Combinatorics:** product rule and permutations; combinations. Axioms of Probability: sample spaces, events and set operations; probability axioms. Conditional Probability and Independence: conditional probability and Bayes rule; probability trees; independent events.
- **Discrete Random Variables:** probability mass function (PMF), cumulative distribution function (CDF); expectation; variance, moments, moment generating function (MGF). Uniform, Bernoulli, Binomial, Poisson, Geometric, Hypergeometric distributions; expectation, variance, MGF of these RVs.
- **Continuous Univariate Random Variables:** probability density function (PDF), CDF, expectation, variance, moments, MGF. Uniform, Exponential, Gamma, Normal distributions; expectation, variance, MGF of these RVs. Transformations (functions) of continuous RVs.
- **Jointly Distributed Random Variables:** joint PMF/PDF, and CDF; marginal distributions; conditional PMF/PDF; conditional expectation and variance; covariance and correlation coefficients.
- **Limit Theorems:** Weak Law of Large Numbers, Central Limit Theorem, Normal approximations.