MATH 3160 - Probability - Fall 2018

Syllabus

- **Instructor:** Alexander (Sasha) Teplyaev, http://teplyaev.math.uconn.edu/ office: MONT429, email: teplyaev@uconn.edu.
- **Lecture times and locations:** Section 001, MWF, 10:10–11:00 in MONT319.
- **Textbook:** No textbook is required. The essential material for the course will be available at http://probability.oer.math.uconn.edu/3160-oer/. It mainly builds on the lecture notes by Prof. Richard Bass and video lectures by Joe Chen and Tom Roby. Other sources of the material are open source textbooks, such as 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. Note that the lectures will not follow any text verbatim, but mostly follow our UConn OER materials.
- **Grades:** quizzes 10%; 2 midterm exams, 25% each; final exam, 40%.
- **Office hours:** MWF 12:10–1:00pm, or by appointment.

- **Prerequisites:** Calculus, up to and including series, limits, partial differentiation, and multiple integration. Recall that MATH 2110Q, 2130Q or 2143Q are strictly enforced as a prerequisite for MATH 3160.
- **Exams: There will be two in-class midterms (tentative dates 10/03 and 11/14) and a final exam.** *No make-up exams will be offered unless under the most extreme and well documented circumstances*, such as a serious illness or family emergency. If you anticipate such circumstances, please notify me asap, and well in advance of the scheduled exam date.

  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. Please note that vacations, previously purchased tickets or reservations, social events, misreading the exam schedule and over-sleeping are not viable excuses for missing a final exam. If you think that your situation warrants permission to reschedule, please contact the DSO with any questions. Once the DSO grants permission to reschedule your final exam, they will notify me, and I will confirm an alternate arrangement.
- **Homework:** Assignments will be posted on the webpage http://www.math.uconn.edu/~teplyaev/math3160f18/
  All assigned problems are subject to appear in the quizzes and/or the exams.
  The HW will not be collected and graded.

- **Quizzes:** They will be given **usually on Fridays**, excepting the two midterm exam weeks. **No make-up quizzes** will be given under any circumstance. In the end, your lowest quiz score(s) will be dropped.

- **Exam guidelines:** You are allowed to bring n pages of handwritten notes (both sides of an 8 x 11 paper) to the nth exam held. **These and your writing utensils are the only items allowed on the exam. No calculator is allowed;** the exam problems will not involve tedious calculations.

  Homework assignments form an integral component of the course. You should make every effort to solve the assigned problems using the concepts learned from the lectures and readings. Remember that if you don't do the homework, you cannot do well on the exams. **Collaboration on HW is encouraged.**

- **From the Academic Calendar:** M 9/10, add/drop via Student Admin closes (without a "W"); M 10/29, last day to drop a course (with a "W").

- **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:

- **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.