Syllabus: MTH 464/564 Probability II

Course credits: 3.0

Meets: live via Zoom MWF 11:00 am - 11:50 am, or prerecorded.

Instructor: Yevgeniy Kovchegov Email: kovchegy@math.oregonstate.edu Office Hours: MW 5-6 or by appointment, via Zoom

Grading scheme: Homework 60%, Online quizzes 40%

Prerequisites: MTH 463/563 and MTH 341. A minimum grade of C- is required in MTH 463/563 and MTH 341.

Textbooks:

(1) Charles M. Grinstead and J. Laurie Snell, *Introduction to Probability* available as a **FREE** e-book at http://www.dartmouth.edu/~chance/teaching_aids/books_articles/probability_book/book.html

A hard copy of the textbook can be acquired at bookstores such as <u>Amazon</u>.

(2) Mark Huber, *Probability: Lectures and Labs* available as a **FREE** e-book at <u>https://www.markhuberdatascience.org/probability-textbook</u> A hard copy of the textbook can be acquired at bookstores such as <u>Amazon</u>

Course Description: The second quarter of probability theory.

Course Content: joint distributions and joint density function, transformations of random variables, independent random variables, sums of independent random variables, conditional distribution and conditional density function, conditional expectation and variance, covariance and correlation, moment generating function, characteristic functions, the central limit theorem and its proof.

Learning goals: (i) know how to obtain marginal distributions from joint distributions; (ii) know how to compute covariances and correlations; (iii) know how to obtain conditional distributions from joint distributions; (iv) know how to compute and apply conditional expectations and variances; (v) be able to compute moment generating functions; (vi) know how moment generating functions are used to compute moments of a random variable; (vii) know how to use probability inequalities including Chernoff bound and Jensen's inequality; (viii) know how to prove the central limit theorem.

Homework: The homework assignments will need to be submitted in PDF format via Canvas and before the respective deadline. Late homework will not be accepted.

Online Quizzes: There will be online quizzes, all on Canvas.

STUDENTS WITH DISABILITIES: Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at <u>http://ds.oregonstate.edu</u>. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

ACADEMIC HONESTY AND STUDENT CONDUCT: Students are expected to be familiar with Oregon State University's Code of Student Conduct. Please review this statement at <u>https://beav.es/codeofconduct</u> **REACH OUT FOR SUCCESS**: University students encounter setbacks from time to time. If you encounter difficulties and need assistance, it's important to reach out. Consider discussing the situation with an instructor or academic advisor. Learn about resources that assist with wellness and academic success at http://oregonstate.edu/ReachOut. If you are in immediate crisis, please contact the Crisis Text Line by texting OREGON to 741-741 or call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255)