

Syllabus  
Stat 510 and 430-401 (undergraduate honors)  
Probability

**Professor:** Lawrence Brown, [lbrown@wharton.upenn.edu](mailto:lbrown@wharton.upenn.edu); Office: 445 JMHH  
Office Hours: TBA, or by appointment (email or call 8-4753, I'm frequently available.)

**Teaching Fellow:** Philip Ernst (Office and Office Hours TBA)

**Textbook:** *Introduction to Probability, 2<sup>nd</sup> Edition*. D. P. Bertsekas and J. N. Tsitsiklis, Athena Scientific

**Topics covered:** Chapters 1 – 6 of the text will be covered in the course. Chapter 7 (Markov Chains) will be included if time permits. The material to be covered includes introductory treatment of discrete and continuous random variables and their distributions; definition and properties of standard distributions; moments and moment generating functions; joint distributions; functions and transformations of random variables; laws of large numbers and the central limit theorem; introduction to stochastic processes.

**Level of coverage:** Stat 510 is a doctoral level course designed to introduce probability theory and applications at the graduate level to students from outside the statistics department. Undergraduates with suitable background and interests may also attend Stat 510 as an honors course, and should register for Stat 430-401. For such students permission of the instructor is needed to register. (Permission will be based on the student's personal interest in the topic and on strong performance in prerequisite mathematics courses.)

The "Problems" sections of the text contain many starred, worked-out exercises that treat additional topics. Many of these will be covered in the course, and supplementary material will be distributed as needed.

**Prerequisite:** College calculus including material on convergence of sequences and series and on multivariable calculus is required. Penn's Math 114 or an equivalent course is an appropriate pre-requisite and is required for undergraduate registration.

**Homework:** Homework will be posted on our website in "canvas". Occasionally students will be required (with advance notice) to submit selected portions of the homework. The primary purpose of the homework is to help you learn the material, but feedback from the required homework will also be helpful in managing the pace and content of the course. Solutions will be posted. Additional problem and review sessions will be scheduled and conducted by Mr. Ernst, as needed.

**Exams:** There will be two midterms and a final. The final is scheduled for Thursday, Dec. 13, from 9 – 11am. The midterm exams will be administered at scheduled times in the evening. They are scheduled to be held on Monday, Oct 8, and Monday, Nov 19, from 6 – 8 pm.

**Grade allocation:** The midterm exams will each count 30% of the grade, and the (cumulative) final will count 40%. Minor (upward) adjustment may occur on the basis of the professor's

subjective evaluation based on the quality of class participation and performance on assigned homework. Undergraduates and graduate students should expect to receive the same exams, but grading standards may differ among the two groups to adjust for their respective levels.