

STAT 302 - INTRODUCTION TO PROBABILITY
2011/2012 – Term 2

- Description:** Basic notions of probability, random variables, expectation and conditional expectation, discrete and continuous probability distributions, limit theorems.
- Prerequisites:** Math 200 or 226 (which may be taken concurrently if 302 is being taken in the second term).
- Notes:** This course is the same as Mathematics 302.
Proofs are an important component of this course.
- Audience:** Undergraduates majoring in the mathematical sciences and in statistics, and students from other disciplines seeking an exposition of the basic elements of probability theory and an introduction to probabilistic modelling.
- Textbook:** A First Course in Probability (8th ed.) by Sheldon Ross, Prentice Hall, 2010.

Topics:

1. Principle of counting; permutation and combination (Chapter 1) 2 hours.
2. Basic notions of probability (Chapters 2 & 3) 8 hours.
Definition and rules of probability, conditional probability, conditional independence.
3. Discrete and continuous probability distributions (Chapters 4 & 5) 11 hours.
Random variables and their expected values, discrete distributions, continuous distributions, functions of random variables.
4. Bivariate and multivariate probability distribution (Chapters 6 & 7) 10 hours.
Joint, marginal and conditional distributions, conditional expectations, multinomial distribution, moment generating functions.
5. Limit theorems (Chapter 8) 4 hours.
Convergence in probability, convergence in distribution, the Central Limit Theorem.

NOTE: The above is a tentative schedule. The topics covered and the order in which they will be presented in this course may be modified.