

STAT 302 - INTRODUCTION TO PROBABILITY
Summer 2023

Description: Basic notions of probability, random variables, expectation and conditional expectation, discrete and continuous probability distributions, limit theorems.

Prerequisites: One of Math 200, 217, 226, 253 and 254

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.

Recommended Textbook: A First Course in Probability by Sheldon Ross, Prentice Hall.

Clickers: We will be using the i>Clicker in lectures. i>Clicker is a response system that allows you to respond to questions posed by instructors during class, and you will be graded on your participation and performance.

Assessment:

- Written assignments 10%
- WeBWork online assignments 10% (Bi-weekly)
- Midterm 25%
- Final exam 50% (you must pass the final exam to pass the course)
- Clicker 5%

Topics:

1. Principle of counting; permutation and combination (Chapter 1) 2 hours.
2. Basic notions of probability (Chapters 2 & 3) 6 hours.
Definition and rules of probability, conditional probability, conditional independence.
3. Discrete and continuous probability distributions (Chapters 4 & 5) 15 hours.
Random variables and their expected values, discrete distributions, continuous distributions, functions of random variables.
4. Bivariate and multivariate probability distribution (Chapters 6 & 7) 9 hours.
Joint, marginal and conditional distributions, conditional expectations, multinomial distribution, moment generating functions.
5. Limit theorems (Chapter 8) 3 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.