

AMS 131: Introduction to Probability Theory

Tentative syllabus and reading list: Second summer session, 2016

The course text is

DeGroot MH, Schervish MJ (2011). *Probability and Statistics*, fourth edition. London: Pearson; abbreviated **DS** below.

Lecture Number	Date	Topic	Pages in DS
1	25 Jul	Introduction; set theory	1–27
2	27 Jul	Probability axioms; combinatorial analysis	28–54
3	29 Jul	Conditional probability; discrete random variables	55–99
4	1 Aug	Continuous random variables; joint, marginal and conditional distributions	100–166
5	3 Aug	Functions of one or more random variables	167–187, 202–206
6	5 Aug	Expectation; mean, variance, median; covariance, correlation	207–255
7	8 Aug	Conditional expectation; utility	256–274
8	10 Aug	Discrete distributions: Bernoulli, Binomial, Hypergeometric, Poisson, Negative Binomial, Multinomial	275–301, 333–336
9	12 Aug	Continuous distributions: Normal, Gamma, Beta, Bivariate Normal, Multivariate Normal, t , Dirichlet; exponential family	302–332
10	15 Aug	Convergence in probability; Law of Large Numbers	347–359
11	17 Aug	Central Limit Theorem; continuity correction	360–375
12	19 Aug	Stochastic processes; Markov chains	188–195
13	22 Aug	Stationary distribution of a Markov chain	196–201
14	24 Aug	Frequentist inferential statistics	417–463
15	26 Aug	Bayesian inferential and predictive statistics	376–416

Assignment	Handed Out	Due
Homework 1	1 Aug	8 Aug
Homework 2	8 Aug	15 Aug
Homework 3	15 Aug	22 Aug
Take-home Final	22 Aug	26 Aug