UNIVERSITY OF CALGARY

FACULTY OF SCIENCE
Department of Mathematics and Statistics

Mathematics 321 Mathematical Probability

(see Course Descriptions for the applicable academic year: http://www.ucalgary.ca/pubs/calendar/)

Reference Text: This outline is indexed to "Mathematical Statistics with Applications", by D.D. Wackerly, W.M. Mendenhall, and R. L. Scheaffer, Sixth Edition. Duxbury Press, in order to provide an indication of the depth of coverage of the various topics.

Syllabus

Topics	**Number of Hours**
Chapter 2: Sample spaces, events, counting techniques; probability measure, Conditional probability, independence	**6**
Chapter 3, omit 3.10: Discrete random variables, probability distribution functions of the geometric, binomial, negative binomial, hypergeometric, and poisson random variables; expected value and variance of discrete random variables; moments and moment generating functions; Chebyshev's inequality and its proof. The Multinomial distribution.	**8**
Chapter 4, omit 4.7 and 4.11: Continuous random variables, probability distribution functions and cumulative distribution functions of continuous random variables; the uniform, normal distributions; the gamma distribution and its special cases: the exponential and chi-square distributions; Expected values, variance, and moment generating functions of continuous random variables; Chebyshev's inequality.	**8**
Chapter 7, (7.2, 7.3 and 7.5): The Central Limit Theorem and its application, including the sampling distribution of the sample mean and the Normal approximation to the Binomial Distribution.	**3**
Chapter 8 (8.5-8.7): Introduction to Estimation and Statistics Inference: point estimation and unbiasedness. Using pivotal quantities to construct confidence interval estimates; confidence interval estimation of the population mean and proportion.	**5**
Chapter 10 (10.1-10.4, 10.6, 10.8): Hypothesis testing of the population mean and proportion. Type I and Type II Error, Power of a test, p-values.	**6**
TOTAL	**36**

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2002:05:01 Effective Fall 2002
Prerequisite change 2009:07:01
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