

ACT. SCI. 2501: BASIC ACTUARIAL MATHEMATICS
Spring 2011
Professor Michael R. Powers

Class Meetings: Tuesdays and Thursdays: 3:30 p.m. - 4:50 p.m.; Alter Hall 607

Office: 614 Alter Hall
Office Hours: Tuesdays and Thursdays: 2:00 p.m. - 3:20 p.m.
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Required Text:

Broverman, S. A., *ACTEX Study Manual for the SOA Exam P and CAS Exam 1*, 2010, Actex Publications. (May be ordered from <http://www.actexamdriver.com/>.)

Learning Objectives:

Students are expected to master the problem-solving skills necessary for passing the SOA Exam P / CAS Exam 1 professional examination. A thorough command of differential, integral, and multivariate calculus is assumed. The topics emphasized in this course are:

- General probability (set functions, basic axioms, independence);
- Bayes' Theorem;
- Univariate probability distributions (probabilities, moments, variance, mode, percentiles, and transformations);
- Multivariate probability distributions (joint, conditional, and marginal distributions – probabilities, moments, variance, and covariance);
- Order statistics; and
- Conditioning arguments.

This course differs from Act. Sci. 2101 in that both class lectures and homework assignments will focus entirely on problem-solving methods.

Schedule (Subject to Revision):

<u>Date</u>		<u>Topic</u>
January	18	Overview
	20	Basic Probability Concepts (Section 1)
	25	Basic Probability Concepts (Section 1)
	27	Conditional Probability and Independence (Section 2)
February	1	Conditional Probability and Independence (Section 2)
	3	Combinatorial Principles (Section 3)
	8	Random Variables and Probability Distributions (Section 4)
	10	Random Variables and Probability Distributions (Section 4)
	15	Random Variables and Probability Distributions (Section 4)
	17	Expectation and Other Distribution Parameters (Section 5)
	22	Expectation and Other Distribution Parameters (Section 5)
	24	Expectation and Other Distribution Parameters (Section 5)
March	1	Frequently Used Discrete Distributions (Section 6)
	3	Frequently Used Discrete Distributions (Section 6)
	8	<i>No Class (Spring Recess)</i>
	10	<i>No Class (Spring Recess)</i>

	15	Frequently Used Discrete Distributions (Section 6)	
	17	Frequently Used Continuous Distributions (Section 7)	
	22	Frequently Used Continuous Distributions (Section 7)	
	24	Frequently Used Continuous Distributions (Section 7)	
	29	Joint, Marginal, and Conditional Distributions (Section 8)	
	31	Joint, Marginal, and Conditional Distributions (Section 8)	
April	5	Joint, Marginal, and Conditional Distributions (Section 8)	
	7	Joint, Marginal, and Conditional Distributions (Section 8)	
	12	Transformations of Random Variables (Section 9)	
	14	Transformations of Random Variables (Section 9)	
	19	Transformations of Random Variables (Section 9)	
	21	Transformations of Random Variables (Section 9)	
	26	Special Topics	
	28	Review	
May	3	<i>No Class (Study Period)</i>	
Grading:		Written Assignments (Mid-Term and Final)	25% each
		Class Participation	50%