

ACT. SCI. 2501: BASIC ACTUARIAL MATHEMATICS
Spring 2009
Professor Michael R. Powers

Class Meetings: Mondays: 4:00 p.m. - 6:30 p.m.; Alter Hall 605

Office: 614 Alter Hall
Office Hours: Tuesdays and Thursdays: 2:40 p.m. - 4:00 p.m.
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Required Text:

Averbach, B. and Mehta, J. S., *SOA Exam P and CAS Exam I Preparation Manual*, 2008, Temple University Actuarial Institute. (AM)

Optional Text:

Wackerly, D. D., Mendenhall, W. III, Scheaffer, R. L., *Mathematical Statistics with Applications* (7th Edition), 2008, Duxbury. (WMS)

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
- Chebyshev's inequality.

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	26	Permutations and Combinations (AM 1.2)
February	2	Fundamentals of Probability (AM 1.3)
	9	Univariate Random Variables (AM 2.2-2.4)
	16	Univariate Random Variables (AM 2.2-2.4)
	23	Bivariate Random Variables (AM 2.5-2.6)
March	2	Moments and Moment-Generating Functions (AM 3.2-3.4)
	9	<i>No Class (Spring Recess)</i>
	16	Transformations of Continuous Random Variables (AM 4.2-4.3)
	23	Transformations of Continuous Random Variables (AM 4.2-4.3)
	30	Transformations of Discrete Random Variables (AM 4.4)
April	6	Discrete Probability Distributions (AM 5.2-5.7)
	13	Continuous Probability Distributions (AM 6.2-6.7, 6.9)
	20	Continuous Probability Distributions (AM 6.2-6.7, 6.9)
	27	Order Statistics and Chebyshev's Inequality (AM 3.6, 4.5)
May	4	Final Review
	11	<i>No Class (Exam Period)</i>
Grading:		Written Assignments (Mid-Term and Final) 25% each Class Participation 50%