Central Connecticut State University  
Department of Mathematical Sciences

**Actl 481: Review for Course P (SOA/CAS)**

**Fall 2019**

Text  
Sample Exam Questions (downloadable at soa.org)  
Online study notes by Marcel Finan (see attachment)  
Supplemental material is available on reserve  
webresources for exam p: University of Windsor

Instructor:  
Dr. Frank Bensics

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Office Hours:  
M/T/WTh 2:45 - 4:00

Prerequisites:  
Two semesters of calculus and at least one course in mathematical probability.

Students for Whom the Course is Intended:  
The course is designed for those who plan to take the first actuarial exam, currently jointly administered by the SOA and CAS

Course Description:  
Lectures and problems (with an emphasis on problems) related to the application of probability and calculus to risk management and insurance

Course Objective:  
Specific focus is on the material specifically covered on the first actuarial exam

**Tentative Schedule**

**WEEKS 1-3**

- Elements of Probability
- Set functions including set notation and basic elements of probability
- Mutually exclusive events
- Addition and multiplication rules
- Independence of events
- Combinatorial Probability
- Conditional Probability
- Law of Total Probability
- Bayes' Theorem
WEEKS 4-5

Probability Distributions
- Random Variables
- Probability functions and probability density functions
- Cumulative distribution functions
- Mode, median, percentiles and moments
- Variance and measures of dispersion, coefficients of variation and skewness
- Moment generating function, Probability Generating Function

Test 1

WEEK 6

Discrete Random Variables
- Binomial, negative binomial, geometric, hypergeometric, Poisson

WEEK 7-8

Continuous Random Variables
- Uniform, exponential, normal, beta, Pareto, lognormal, gamma, Weibul

Test 2

WEEK 9-10

Multivariate Distributions
- Joint probability functions and joint probability density functions
- Joint cumulative distribution functions
- Central Limit theorem
- Covariance and correlation coefficients
- Probabilities and moments for linear combinations of independent random variables

WEEK 11

Insurance Applications

Test 3

WEEKS 12-14

Review

Grading:

2 take home tests (15% each)
three in class tests (count higherst two) (20% each)
final (30%)
Any student who passes the P during semester will receive an A

University Policies:

1. You must take the final exam at the specified time

2. If you need course adaptations or accommodations because of a disability (certified by the university), please make an appointment as soon as possible

3. In the event of a weather emergency which requires curtailment or cancellation of classes, call 860-832-3333 for the "general snow message"

4. Last day to withdraw is Nov. 21. Withdrawal forms are available in the Enrollment Center in Willard Hall. Cessation of attendance, notice to the instructor or telephone calls to the Enrollment Center are not considered official notice of intention to withdraw.