ACMA 490-3

Fall 2013

Selected Topics: Stochastic Analysis of Insurance Portfolios Day Course

Instructor: [Dr. Gary Parker](#)

Prerequisite:

ACMA 320 & permission of the instructor.

Required Text:

No textbook required.

References:

Stochastic Analysis of Insurance Portfolios, G. Parker, 2013

Calendar Description:

Life insurance models. Interest rate models for life insurance: time series, stochastic differential equations, estimation. Portfolios of identical policies. Diversified portfolios.

Outline:

Basic model for studying life insurance contracts
Models for the Rate of return:
    Time Series; ARMA models
    Stochastic Differential Equations; Ito formula, log-normal model, Ornstein-Uhlenbeck process, Cox-Ingersoll-Ross model, Principle of covariance equivalence
    Other models: Regime-switching model, Wilkie model
Insurance risk: One contract, A portfolio of identical contracts
Life Insurance with Random Interest and Mortality: Present value, net single premium
Portfolio of Policies with Random Interest and Mortality: moments
Distribution of the Present Value of Benefits for a Portfolio
    Approximating the Distribution; Limiting Portfolio
Diversified portfolios

Grading Scheme:

Assignments & Term Project-30%
Midterm-30%
Final-40%
Grading is subject to change.