22S:273 Fall - 2007

Instructor:

Nariankadu D. Shyamal kumar (call me Shyamal pronounced shá mul !)
Office: SH 208
Phone: 335-1980
EMail: shyamal-kumar@uiowa.edu
Classes: 10:55am - 12:10pm TTR - 161 VAN
Office Hours: 16:00 to 17:00 MWF or by appointment.
Website: ICON at the url http://icon.uiowa.edu

Department:

Statistics and Actuarial Science, 241 SH, 335-0712.
Chair - L. Tierney, luke-tierney@uiowa.edu., 335-0712

Syllabus:

The course will cover two major areas:

Multi-State (or Markovian) Actuarial Models for Disability/Critical Illness/Long Term Care (LTC)/AIDS

In 22S:181 and 22S:182 we study a path of an insured up to the first transition of state. For example, in life insurance of 181 there can be only one transition, from being alive to death; in 182 when we consider withdrawal, we study the path of the insured from being alive and insured to being dead or being alive and having canceled the policy. In the first part we will study models which allow for multiple-transitions through multiple states which play an important role in modeling of the products listed above. (Note that in Exam M (and hence in 182) the kind of multi-state models covered are almost not useful in practice) But in order to be able to do this we will expand our knowledge of probability to learn some continuous time Markov Chains, some Semi-Markov processes etc.. Even though the treatment will be reasonably rigorous, the emphasis will be on applications and gaining valuable insight. I will be using the following two books apart from some actuarial journal papers: i. Actuarial Models for Disability Insurance by Steve Haberman and E. Pitacco ii. Life Insurance Mathematics (the Markovian Model) by H. Wolthius
The Binomial Asset pricing Model

We will cover as much as we can of the book titled "Stochastic Calculus for Finance: Part I" by Steven Shreve. This book forms a one semester course in the Carnegie Mellon Bachelor’s program in Computational Finance, and I like it very much as without requiring any knowledge of measure theory and continuous time stochastic processes it covers many important financial concepts. This framework will also allow me to introduce to you discrete time martingales, a very important stochastic process for Finance. Tentatively, if time permits I will cover some examples from the book "Market valuation methods in Life and Pension Insurance” by Thomas Moller and Mogens Steffensen. While some of the material in Shreve’s book would have been seen by you in some form, this book will introduce you to some more important concepts and provide you with better insights into concepts you are already familiar with. Moreover and equally importantly, the language of the book will help you smoothly transition to continuous time finance, and you may want to read the Part II of the book later on.

Evaluation System:

Students may choose to be either be evaluated based on their solutions to the set of assigned problems or based on their presentation of a paper on a topic relevant to the course. Depending on the difficulty or length (or both) of the paper, you may wish to read it in a group of two.