

# 22S:181 Spring - 2008

Course policies are governed by the College of Liberal Arts and Sciences. Please visit the url, [http://www.clas.uiowa.edu/students/academic\\_handbook/](http://www.clas.uiowa.edu/students/academic_handbook/) in order to get familiar with the following;

- i. University policies regarding student rights and responsibilities
- ii. University policies regarding academic misconduct

Also, see the appendix to this handout.

Please visit <http://www.stat.uiowa.edu/courses/tutors.shtml> for a list of independent tutors.

## **Instructor:**

Nariankadu D. **Shyamalkumar** (i.e. call me Shyamal pronounced shá mu1 !)

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Classes: 2:30pm - 3:20pm MWF - 112 MH

Office Hours: 10:30 to 11:30 MF or by appointment.

Website: ICON at the url <http://icon.uiowa.edu>

## **Department:**

Statistics and Actuarial Science, 241 SH, 335-0712.

Chair - Prof. Luke Tierney, [luke-tierney@uiowa.edu](mailto:luke-tierney@uiowa.edu), 335-0712

## **Goal of this Course:**

The goal of this course is to extend the valuation concepts learnt in 22S:180 to value non-deterministic cashflows. Our focus will be on cashflows contingent on the life of a person and hence the name of this course, Life Contingencies. The probabilistic model required to do so is part of 22S:174, which is a prerequisite. In this course we will consider cashflows contingent on only one life and extend these concepts to multiple lives in the follow up course, 22S:182. The valuation concepts we study here form the basis of both life insurance valuation and pricing.

## Text, Recommended Reading & Miscellany:

### **Bowers, et. al. *Actuarial Mathematics, 2nd Edition SoA***

This is an official text of the SOA for the material that we shall cover in this course. Particularly notable is the extensive set of exercises provided at the end of each chapter. An errata for this book is available on the SOA website. Available from the SOA for \$95.

### **Gerber, H. U. *Life Insurance Mathematics, 3rd Edition Springer Verlag***

This is both concise in its choice of topics as well as terse in its explanations. A mathematically mature student might want to give it a quick read. It has some elegant *material* not included in the text and hence not included in SOA exam 3. Good set of exercises with solutions at the end. Available in the library.

### **Atkison, D. B. & Dallas, J. W. *Life Insurance Products & Finance, SOA***

This is a wonderful book to read. Moreover, it is co-authored by an Iowa alumnus which might make it for some a **MUST** read. Available from the SOA for \$85.

### **Jordan, C. W. *Life Contingencies, Second Edition, SOA***

Most actuaries who graduated before the publication of the text used this book. Available in the library and for \$50 from the SOA.

## **Syllabus:**

The syllabus will be described using the text. The list of sections below forms a core of the syllabus with limited digressions at some points along the course, time permitting.

### **Pre-requisite from 180**

The material covered in Chapters 1-4 of the book by Ruckman, C.; & Francis, J., *Financial Mathematics (2nd Ed.)*, 2005, BPP Professional Education.

### **Pre-requisite from 174**

We will assume the knowledge of Chapter 3 of the text.

### **Contents of this course**

The chapter and section numbers refer to the second edition.

Chapter 4: Sections 4.1-4.4

Chapter 5: Sections 5.1-5.4

Chapter 6: Sections 6.1 (excluding utility-theory approach), 6.2-6.4

Chapter 7: Sections 7.1(excluding utility-theory approach), 7.2-7.6

We may cover, time permitting, parts of Chapter 8, especially sections 8.1-8.4

### **Practice Problem Sets**

The url, <http://www.soa.org/STATIC/examinations.html>, contains SOA exam papers after year 2000. Those before year 2000 can be purchased from the Copy Center, Room C102, Pappajohn Building (College of Business). Ask for the manual of a particular section of 22S:188. For example, if you want the old exam papers on compound interest, ask the manual for 22S:188 Section 140. Below is a list of five manuals and the topics they cover.

22S:188 Section 100 Mathematics (useful for preparing Exam 1)

22S:188 Section 110 Probability and Statistics (useful for Exam 1, 22S:130, 131, 153, 154)

22S:188 Section 140 Mathematics of Finance (useful for 22S:180)

22S:188 Section 150 Life Contingencies (useful for 22S:181 and 182)

22S:188 Section 151 Risk Theory (useful for 22S:175)

### **Evaluation System:**

#### **Homework: 10%**

Solutions to assignments will be posted on the course web site. I may choose an unannounced subset of problems to be graded with the assumption that you will be responsible enough to confirm the correctness of your ungraded solutions (especially those in doubt) by comparing it with the published one or by getting it checked by me during office hours.

#### **Exams and Calculators**

Only official SOA/CAS calculators will be allowed. Please look at their web-site for the latest regulations.

Mid-terms and the final will be closed-book. They will consist of **short answer type** problems. One may find the past SOA exam problems from the relevant material useful in preparing for them.

- i. Mid-Term 1 - Monday, the 25th of February (in-class) - 25%
- ii. Mid-Term 2 - Monday, the 7th of April (in-class) - 25%
- iii. Final - Friday, 16th of May at 12:00pm - 40%

## **Grading**

Undergraduate and graduate students will be treated as two separate groups when it comes to assigning final grades. **Attendance may also affect your grade.**

## College of Liberal Arts & Sciences: Policies and Procedures

- **Administrative Home of the Course**

The administrative home of this course is the College of Liberal Arts and Sciences, which governs academic matters relating to the course such as the add/drop deadlines, the second-grade-only option, issues concerning academic fraud or academic probation, and how credits are applied for various graduation requirements. Different colleges might have different policies. If you have questions about these or other CLAS policies, visit your academic advisor or 120 Schaeffer Hall and speak with the staff. The CLAS Academic Handbook also contains important CLAS academic policies: [www.clas.uiowa.edu/students/academic\\_handbook/index.shtml](http://www.clas.uiowa.edu/students/academic_handbook/index.shtml)

- **Academic Fraud**

Plagiarism and any other activities that result in a student presenting work that is not his or her own are academic fraud. Academic fraud is reported to the departmental DEO and then to the Associate Dean for Academic Programs and Services in the College of Liberal Arts and Sciences who deals with academic fraud according to these guidelines: [www.clas.uiowa.edu/students/academic\\_handbook/ix.shtml](http://www.clas.uiowa.edu/students/academic_handbook/ix.shtml)

- **Making a Suggestion or a Complaint**

Students have the right to make suggestions or complaints and should first visit with the instructor, then with the course supervisor if appropriate, and next with the departmental DEO. All complaints must be made within six months of the incident. [www.clas.uiowa.edu/students/academic\\_handbook/ix.shtml#5](http://www.clas.uiowa.edu/students/academic_handbook/ix.shtml#5)

- **Accommodations for Disabilities**

A student seeking academic accommodations first must register with Student Disability Services and then meet with an SDS counselor who determines eligibility for services. A student approved for accommodations should meet privately with the course instructor to arrange particular accommodations. [www.uiowa.edu/~sds/](http://www.uiowa.edu/~sds/)

- **Understanding Sexual Harassment**

Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. Visit [www.sexualharassment.uiowa.edu/](http://www.sexualharassment.uiowa.edu/) for definitions, assistance, and the full policy.

- **Reacting Safely to Severe Weather**

The University of Iowa Operations Manual section 16.14 outlines appropriate responses to a tornado (i) or to a similar crisis. If a tornado or other severe weather is indicated by the UI outdoor warning system, members of the class should seek shelter in rooms and corridors in the innermost part of a building at the lowest level, staying clear of windows, corridors with windows, or large free-standing expanses such as auditoriums and cafeterias. The class will resume, if possible, after the UI outdoor warning system announces that the severe weather threat has ended.

- **Student Classroom Behavior**

The ability to learn is lessened when students engage in inappropriate classroom behavior, distracting others; such behaviors are a violation of the Code of Student Life. When disruptive activity occurs, a University instructor has the authority to determine classroom seating patterns and to request that a student exit the classroom, laboratory, or other area used for instruction immediately for the remainder of the period. One-day suspensions are reported to appropriate departmental, collegiate, and Student Services personnel (Office of the Vice President for Student Services and Dean of Students). University Examination Policies

- **Missed Exam Policy**

University policy requires that students be permitted to make up examinations missed because of illness, mandatory religious obligations, certain University activities, or unavoidable circumstances. Excused absence forms are required and are available on the Registrar web site. [www.registrar.uiowa.edu/forms/absence.pdf](http://www.registrar.uiowa.edu/forms/absence.pdf)

- **Final Examinations**

An undergraduate student who has two final examinations scheduled for the same period or more than three examinations scheduled for the same day may file a request for a change of schedule before the published deadline at the Registrar's Service Center, 17 Calvin Hall, 8-4 M-F, (384-4300).