

22S:180
Mathematics of Finance I
Spring 2007

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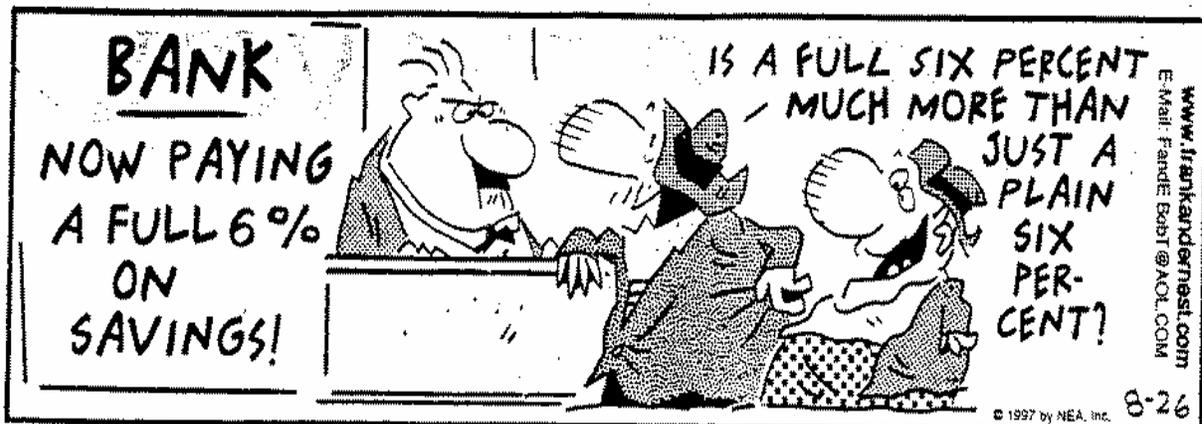
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http://www.clas.uiowa.edu/students/academic_handbook/

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Special Arrangements: I would like to hear from anyone who has a disability which may require seating modifications or testing accommodations or accommodations of other class requirements, so that appropriate arrangements may be made. Please contact me during my office hours.

Frank and Ernest

By Bob Thaves



Instructor: J. Broffitt, 231 SH, 335-0820, james-broffitt@uiowa.edu

Office Hours: 2:00 to 3:00 MWR or by appointment.

Email: Any emails relating to this course will be sent to you via **your email address registered with the University (no exceptions)**. Check your email at least once per day. Email is usually not an effective medium for resolving questions about homework problems, exercises in the text, or conceptual problems. Face to face contact is better. I generally prefer not to answer such questions by email, but questions about administrative aspects of the course are welcome via email. At any time I would be interested in learning your perceptions about how the course is going.

Department: Statistics & Actuarial Science, 241 SH, 335-0712.
Department Chair - L. Tierney, luke-tierney@uiowa.edu, 5-0712.

Classes: 11:30 Monday, Wednesday, Friday in room 66 SH
11:30 Thursday in room 114 MLH

Text: There are two textbooks.

1. *Financial Mathematics - A Practical Guide for Actuaries and other Business Professionals* (Second Edition), 2005, by C. Ruckman and J. Francis. The exam 2/course FM syllabus consists of the following sections: Chapters 1, 2, Chapter 3 (3.1-3.9), Chapter 4 (4.1-4.5), Chapter 5, Chapter 6 (6.1-6.3), Chapter 7 (7.1-7.9), Chapter 8 (8.1-8.3).

An alternate textbook for the professional exam is *Mathematics of Investment and Credit* (Third Edition), 2004, by Broverman, S.A. See the SOA website for the exam syllabus. Beginning in fall 2007, a third text will be added to the list of possible books - *Mathematical Interest Theory* by Daniel, J.W. and Vaaler, L.J.F. However, for our course we will use the text by Ruckman and Francis.

2. *Derivatives Markets* (Second Edition), 2006 by McDonald, R. The exam 2/course FM syllabus consists of the following sections: Chapter 1 (1.1-1.4); Chapter 2 (2.1-2.6); Chapter 3 (3.1-3.5), Chapter 4 (4.1-4.4), Chapter 5 (5.1-5.4), Chapter 8 (8.1-8.2), Appendices 2A and 5B.

Optional study material:

Various types of study materials are available from different sources. Here are some web sites you can check:

<http://www.actexamdriver.com> -- this seems to be the most popular with students.

<http://www.bpp.com>

<http://www.afshapiro.com/students.html>

Several old SOA Compound Interest exams are in the PBB Copy Center (room C 102). You can purchase a copy for about \$10.50. Ask for the material for 22S:188 Section 140. More recent Society exams may be downloaded from the SOA web site: <http://www.soa.org>

Objectives: This course is intended to provide a good understanding of the mathematics of compound interest, and to provide an introduction to financial derivatives. This is of fundamental importance in actuarial work. Students returning from internships and former students coming back for a visit often comment that compound interest is one of the most useful courses they took. In addition, this course will prepare students for SOA Course FM/CAS Exam 2, and will provide a background for the study of life contingencies. One of the prerequisites for 22S:181, Life Contingencies I, is a grade of C or higher in 22S:180.

In the early part (Chapters 1-4) we consider the basic mathematics, terminology and notation needed to deal with interest problems. Students are sometimes overwhelmed at first. However, with practice it all begins to make sense. Thus, it is important to work through applicable textbook problems in addition to the homework problems assigned.

The latter part (Chapters 5, 6, 7, and 8) deals more with applications of the theory. This will help to reinforce many of the ideas.

Spring 2007 Exam Date for CAS/SOA Exam 2/Course FM: Friday, May 25. This exam lasts 2.5 hours. As of this writing, exam applications are not available, but they must be submitted very early (probably sometime in March or April).

Attendance: Attendance is mandatory. I expect students to be on time and attend all classes. Being sick is a legitimate reason to miss class, but just feeling a little under the weather is not. **Excessive absences may result in a lowering of your grade or a failing grade.**

Homework: Unless otherwise stated, homework assignments will be collected on Fridays and returned on Mondays. Submit homework on 8.5x11 paper. **If there is more than one page, staple them together.** Homework is due at the beginning of the class period. I do not mind if you work with others on homework problems, and I encourage you to come to me for hints if you are stuck. However, you should first attempt to do the problems on your own, and you are to write the solutions on your own rather than copying the work of others. Do not merely write down answers, but clearly show how you got your results. Homework may be submitted one class period late, but there will be a 25% penalty. Late homework creates additional burdens on the grader. The penalty is to encourage you to be on time with your homework, and thus make life a bit easier for the grader.

Friendly Advise: Main rule -- do not fall behind! The material is cumulative. Most of you will need a minimum of two to three hours of study after each class (not including class time) to successfully learn the course material. Some of you will need more. If you do not put in the time, you will not learn. Your goal should be to understand rather than to just memorize facts and formulas.

Come to office hours to get your problems sorted out promptly. Study the text carefully and keep up with the lectures. Don't read it like a novel. Do the problems and if you get stuck, look for similar worked examples. Work problems by yourself or in small groups -- both assigned homework problems and others from the text and former SOA exam problems. Working exercises is *the* major way to assess your understanding and to solidify concepts. You cannot learn how to solve problems by merely watching your teacher do them -- you must solve problems on your own. When you do not understand, ask questions. Be a participant and not just a spectator.

Calculators: You will need either the Texas Instruments BA II Plus or the BA II Plus Professional. These calculators are the only ones allowed on SOA/CAS exams that do interest calculations. The II Plus costs about \$30, and the II Plus Professional costs about \$50. You will need to get one and get used to it prior to our first exam. On exams you will need one of these calculators. In addition you may use any other calculator(s) approved for the SOA exams. I will provide some instructions for using this calculator. An alternate calculator guide is available on the SOA website.

Exams: Exams will be closed book. Do not wear caps or hats during the exams. There will be three in-class exams plus a final. Exam dates are:

Exam 1:	Wednesday, February 14,	2217 SC
Exam 2:	Wednesday, March 21	2217 SC
Exam 3:	Wednesday, April 18	2217 SC
Final Exam:	Thursday, May 10 7:30 AM	Room TBA

Grades: Grades will be based on the percent of points earned on exams and homework; however, **attendance may also affect your grade.** Each exam will count 18%, the final will count 32%, and homework will count 14%. If E_i is the percent of points earned on exam i , F is the percent of points earned on the final, and H is the percent of points earned on homework, your course composite will be calculated by the following weighted average: $0.18[E_1 + E_2 + E_3] + 0.32F + 0.14H$. Your grade for this course will be assigned according to the following **approximate** scale:

Undergraduate Students	Graduate Students	Grade
90 to 100	90 to 100	A
75 to 89	80 to 89	B
60 to 74	70 to 79	C
50 to 59	60 to 69	D
0 to 49	0 to 59	F

The cutoff points may vary depending on the difficulty of the exams. Also, borderline cases may receive a + or –, and **grades may be adjusted due to attendance.**