

**THE UNIVERSITY OF IOWA**  
**College of Liberal Arts and Sciences**  
**Department of Statistics and Actuarial Science**

## **ACTS:4130 (22S:174)    Quantitative Methods for Actuaries**

**Fall 2014<sup>i</sup>**  
**2:30 p.m. - 3:20 p.m., MWF, at 40 SH**

### **1    Contact information**

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<sup>i</sup>This course is also offered in Spring 2015.

## 2 Course description and objectives

This foundation course, which is compulsory for B.S. and M.S. in Actuarial Science students, consists of two separate parts:

### Part 1. Financial derivatives (approximately two-third of the course)

The main objective of this course is to prepare you adequately for the second part of the SOA Exam FM (Financial Mathematics), namely, the financial economics portion, which accounts for 20-35% of the entire exam according to the exam syllabus. Upon completion of ACTS:3080 (22:180) and this course, you will be equipped with the necessary knowledge to take (and, most importantly, pass!) Exam FM.

### Part 2. Introductory life contingencies (approximately one-third of the course)

In the second part, we shall switch gears and develop a probabilistic framework that is crucial to valuing “contingent” cash flows in SOA Exam MLC (Models for Life Contingencies). The probabilistic tools we learn will be applied and further enhanced in the two follow-up courses, ACTS:4180 (22S:181) “Life Contingencies I” and ACTS:4280 (22S:182) “Life Contingencies II”, to value typical insurance products.

*Note that a grade of C+ or higher in this course is a prerequisite for ACTS:4180 (22S:181) and ACTS:4380 (22S:183).*

## 3 Exam FM

In Fall 2014, Exam FM will be offered via computer-based testing (CBT) in October (16-27) and December (9-20). The registration deadlines are September 4, 2014 and October 29, 2014 respectively. The tentative 2015 CBT schedule is available at <https://www.soa.org/Education/Exam-Req/Exam-Day-Info/edu-2015-cbt-test-schedule.aspx>. More details of Exam FM (e.g. syllabus, sample exam questions, etc.) can be found at <https://www.soa.org/education/exam-req/edu-exam-fm-detail.aspx>.

## 4 Texts

There are no required textbooks in this course. We shall follow closely the course lecture notes, which will be made available on ICON. The notes not only address all important topics required in the financial economics portion of Exam FM, but also include a wide variety of examples for exam preparation.

## 4.1 Recommended texts

Here are two recommended texts available in the university bookstore:

1. *McDonald, R.L., 2013. Derivatives Markets (Third Edition). Pearson.*

This is the official textbook for the Financial Economics portion of Exam FM. We shall cover all required sections in the exam syllabus:

Chapter 1: Introduction to Derivatives

Chapter 2: An Introduction to Forwards and Options

Chapter 3: Insurance, Collars, and Other Strategies

Chapter 4: Introduction to Risk Management (Sections 4.1-4.4)

Chapter 5: Financial Forwards and Futures (Sections 5.1-5.4 and Appendix 5.B)

Chapter 8: Swaps (Sections 8.1-8.3)

If time permits, we will also cover:

Chapter 9: Parity and Other Option Relationships

Pearson has published *Student Solutions Manual to Derivatives Markets*, which provides solutions to all even-numbered end-of-chapter questions in the text.

2. *Dickson, D.C.M., Hardy, M.R., Waters, H.R., 2013. Actuarial Mathematics for Life Contingent Risks (Second Edition). Cambridge University Press.*

This is the official textbook for Exam MLC. We shall cover:

Chapter 2: Survival models

Chapter 3: Life tables and selection

## 4.2 Study manuals

You may also make use of study manuals available in the market, e.g.:

1. Cherry, H., Gorvett, R., 2014. ASM Study Manual for Exam FM/Exam 2 (11th Edition)
2. Li, J., Ng, A. 2014. ACTEX MLC Study Manual (Fall 2014 Edition)
3. Weishaus, A., 2014. ASM Study Manual for Exam MLC (14th Edition)

## 5 Grading system

Assessment in this course comprises the following components:

### 1. Assignments: 20%

There will be 4 to 5 assignments in this course. You will have two weeks to work on each assignment. Late homework will not be accepted.

*A note on collaboration:* You are welcome to discuss assignment problems with me during my office hours. You are also encouraged to discuss homework problems with other students. However, what you hand in must ultimately be your own work.

### 2. Midterm Exams: 40%

There will be two in-class written Midterm Exams to be held on October 10, 2014 and November 21, 2014. Each test lasts for 50 minutes and accounts for 20% of your total grade.

### 3. Final Examination: 40%

A two-hour comprehensive written examination will take place in the week of December 15-19, 2014. The exact date and time will be announced by the Registrar generally by the tenth day of classes. I will announce the final examination date and time for this course at the course ICON site once it is known. Do not plan your end of the semester travel plans until the final exam schedule is made public. It is your responsibility to know the date, time, and place of the final exam.

The Midterm Tests and Final Exam are all closed-book and no formula sheet is allowed (and on Exam FM as well!). They consist of several short-answer questions similar in style to SOA Exam FM questions. Only SOA-approved calculators are allowed.

Plus or minus grading system will be used in this course. Tentatively, the final grade will be assigned as follows:

Undergraduate students		
A- [85, 90)	A [90, 95)	A+ [95, 100]
B- [70, 75)	B [75, 80)	B+ [80, 85)
C- [55, 60)	C [60, 65)	C+ [65, 70)
D- [40, 45)	D [45, 50)	D+ [50, 55)
F [0, 40)		

Graduate students		
A- [86.5, 91)	A [91, 95.5)	A+ [95.5, 100]
B- [73, 77.5)	B [77.5, 82)	B+ [82, 86.5)
C- [59.5, 64)	C [64, 68.5)	C+ [68.5, 73)
D- [46, 50.5)	D [50.5, 55)	D+ [55, 59.5)
F [0, 46)		

These are not absolute scales and may be slightly adjusted depending on the difficulty of the exams.

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

### **Administrative Home**

The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed to 120 Schaeffer Hall, or see the CLAS Academic Policies Handbook at <http://clas.uiowa.edu/students/handbook>.

### **Electronic Communication**

University policy specifies that students are responsible for all official correspondences sent to their University of Iowa e-mail address (@uiowa.edu). Faculty and students should use this account for correspondence (Operations Manual, III.15.2. Scroll down to k.11).

### **Accommodations for Disabilities**

A student seeking academic accommodations should first register with Student Disability Services and then meet with the course instructor privately in the instructor's office to make particular arrangements. See [www.uiowa.edu/~sds/](http://www.uiowa.edu/~sds/) for more information.

### **Academic Honesty**

All CLAS students or students taking classes offered by CLAS have, in essence, agreed to the College's Code of Academic Honesty: "I pledge to do my own academic work and to excel to the best of my abilities, upholding the IOWA Challenge. I promise not to lie about my academic work, to cheat, or to steal the words or ideas of others; nor will I help fellow students to violate the Code of Academic Honesty." Any student committing academic misconduct is reported to the College and placed on disciplinary probation or may be suspended or expelled (CLAS Academic Policies Handbook).

## CLAS Final Examination Policies

The final examination schedule for each class is announced by the Registrar generally by the fifth week of classes. Final exams are offered only during the official final examination period. **No exams of any kind are allowed during the last week of classes.** All students should plan on being at the UI through the final examination period. Once the Registrar has announced the date, time, and location of each final exam, the complete schedule will be published on the Registrar's web site and will be shared with instructors and students. It is the student's responsibility to know the date, time, and place of a final exam.

## Making a Suggestion or a Complaint

Students with a suggestion or complaint should first visit with the instructor (and the course supervisor), and then with the departmental DEO. Complaints must be made within six months of the incident (CLAS Academic Policies Handbook).

## Understanding Sexual Harassment

Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. All members of the UI community have a responsibility to uphold this mission and to contribute to a safe environment that enhances learning. Incidents of sexual harassment should be reported immediately. See the UI Comprehensive Guide on Sexual Harassment for assistance, definitions, and the full University policy.

## Reacting Safely to Severe Weather

In severe weather, class members should seek appropriate shelter immediately, leaving the classroom if necessary. The class will continue if possible when the event is over. For more information on Hawk Alert and the siren warning system, visit the Department of Public Safety website.

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