

This syllabus is subject to change; the final version will be made available for enrolled students at the start of the session or semester.



University of Iowa

ACTS:4160
Actuarial Exam IFM Prep.
Course Syllabus
Spring 2019

March 4, 2019 – May 3, 2019*
M and F, 31 SH
4:30 p.m. – 5:20 p.m.

COLLEGE OF
LIBERAL ARTS & SCIENCES
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Department of Statistics and
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* This is an off-cycle course that lives in the second half of the semester.

1 Contact Information

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(**Note: Please put “ACTS:4160” in the subject line**)
 - ▷ *Personal homepage:* <https://sites.google.com/site/ambroseloy>
(Feel free to visit it from time to time for latest updates on my courses and books!)
 - ▷ *Office hours:* 2:45 p.m. – 3:30 p.m. and 4:30 p.m. – 5:15 p.m., Tuesday and Thursday, and by appointment
- **DEO:** Professor Joseph B. Lang
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2 Course Description and Objectives

Prerequisite: C+ or above in ACTS:3080 (Mathematics of Finance I)

Recommendation: Having taken or taking ACTS:4380 (Mathematics of Finance II) and FIN:3300 (Corporate Finance)

This one-credit exam preparation course is designed for students who intend to take the Investment and Financial Markets (IFM) Exam offered by the Society of Actuaries (SOA) in July 2019. It is dedicated to the *corporate finance and investment* portion of the exam syllabus with an emphasis on the more quantitative and demanding topics. Specifically, it will cover:

Topic 1: Mean-Variance Portfolio Theory (10-15% of Exam IFM),

Topic 2: Asset Pricing Models (5-10% of Exam IFM), and

Topic 4: Investment Risk and Project Analysis (10-15% of Exam IFM).

If time permits, we will also learn

Topic 3: Market Efficiency and Behavioral Finance (5-10% of Exam IFM).

Drawing upon a wide variety of well chosen problems from such sources as various actuarial exams (SOA, CAS, and IFA) and corporate finance textbooks, this course adopts an example-driven approach to teaching and learning corporate finance. Not only will you be inculcated with the fundamental ideas behind the IFM corporate finance topics, you will also have ample opportunities to practice what you learn through a carefully selected set of exam-type examples and problems. In essence, this course fosters conceptual understanding as well as problem-solving skills.

After taking this course, the successful student is expected to:

1. Describe the general risk-and-return relationships that are commonly observed in finance.
2. Understand different ways to measure investment risk and conduct project analysis using advanced techniques used in capital budgeting.
3. Take and, most importantly, pass Exam IFM in July 2019 with considerable ease.

3 Exam IFM

Exam IFM is a relatively new three-hour computer-based exam that consists of 30 multiple-choice questions, each of which includes 5 answer choices identified by (A), (B), (C), (D), and (E). It was offered for the first time in July 2018 and replaced its predecessor, Exam MFE (Models for Financial Economics), which was exclusively about the use and pricing of derivatives. Exam IFM encompasses much of the MFE derivatives material, but with a lot of corporate finance added. Roughly speaking, 50% of IFM is about *derivatives* (Topics 6 to 10) and the other 50% is about *corporate finance and investment* (Topics 1 to 5). There are two released MFE past exams (Spring 2007 and Spring 2009), 60 sample questions on introductory derivatives, 40 sample questions on advanced derivatives, and 44 questions on finance and investment, all with detailed solutions. More information about Exam IFM can be found at <https://www.soa.org/education/exam-req/edu-exam-ifm-detail.aspx>.

Currently, the derivatives portion of the IFM exam syllabus is well covered in ACTS:4380 and many of our students take FIN:3300 to earn the VEE credit as well as to learn the IFM corporate finance topics. This exam preparation course complements FIN:3300, provides an in-depth treatment of the more mathematical corporate finance topics, and, most importantly, is geared towards helping you pass Exam IFM. Together, ACTS:4160, ACTS:4380, and FIN:3300 adequately cover the syllabus of Exam IFM.

Exam IFM is offered three times every year (in March, July, and November). In 2019, Exam IFM will be offered via computer-based testing (CBT) from March 8 to March 14, **July 9 to July 15**, and November 21 to November 27. The registration deadlines are February 5, June 4, and October 22, respectively (please refer to <https://www.soa.org/Education/Exam-Req/Exam-Day-Info/edu-2019-cbt-test-schedule.aspx>). It is strongly suggested that you take the exam in **July** shortly after you learn the material from ACTS:4380, FIN:3300, and this course, do the homework, and study for the quizzes and exams (as the old saying goes, *strike while the iron is hot!*). The bottom line is: You should aim to *have three professional exams under your belt, namely, P, FM, and IFM, before the Career Fair of 2019*, in order to be a competitive candidate seeking a permanent actuarial job.

4 Texts

There are no required textbooks in this course. We shall follow closely the instructor's course notes, regarded as a mini-textbook, which will be made available on ICON (<http://icon.uiowa.edu>) for registered students to download:

Lo, A., *Course Package for ACTS:4160 Actuarial Exam IFM Preparation (Spring 2019 Edition)*.

These course notes not only provide an in-depth treatment of Topics 1, 2, and 4 of Exam IFM, but also present lots of intuition for you to understand the subject matter deeply, and a wide variety of illustrative examples and practice problems for exam preparation. During lectures, the instructor will provide a framework, cover the main ideas, point out subtleties, and work out examples together with you. You should take supplementary notes to better understand concepts and fill in missing details.

An optional text for this course is

Corporate Finance (Fourth Edition), 2017, by Berk, J. and DeMarzo, P., Pearson, ISBN: 978-0-13408-327-8.

This is the official textbook for the corporate finance portion of Exam IFM. Our course package will cover the following required sections in Berk and DeMarzo for Topics 1, 2, and 4 of the exam syllabus in a different but more cohesive order: (none of the appendices are included in the required readings)

- Chapter 8: Fundamentals of Capital Budgeting, Section 5 (Analyzing the Project)
- Chapter 9: Valuing Stocks, Section 5 (Information, Competition, and Stock Prices)
- Chapter 10: Capital Markets and the Pricing of Risk
- Chapter 11: Optimal Portfolio Choice and the Capital Asset Pricing Model
- Chapter 12: Estimating the Cost of Capital
- Chapter 13: Investor Behavior and Capital Market Efficiency
- Chapter 22: Real Options

Note that Chapters 14, 15, 16, 23, and 24 of Berk and DeMarzo are required chapters that relate to Topic 5: Capital Structure (10%), which you should have learned in FIN:3300.

We will also cover the two IFM study notes:

- IFM-21-18: Measures of Investment Risk, Monte Carlo Simulation, and Empirical Evidence on the Efficient Markets Hypothesis
- IFM-22-18: Supplementary Material for Derivatives: “Actuarial-Specific Applications of Options and other derivatives, and Expanded Coverage on Exotic Options”

IFM-21-18 supplements the corporate finance and investment material in Berk and DeMarzo and presents some more actuarially-oriented material pertaining to Topics 3 a), 4 a), and 4 b) of the IFM exam syllabus. IFM-22-18 studies embedded options in common insurance products and points out their connections to standard options studied in ACTS:4380.

5 Grading System

Only “pass” (coded as S, standing for “Satisfactory”) or “fail” (coded as U, standing for “Unsatisfactory”) will be given for both undergraduate and graduate students in this course. A “pass” will be given provided that a student has participated actively and meaningfully in this course, which will be determined from:

- **Class attendance**

All registered students are expected to attend classes regularly and participate actively. It is impossible for absentees to get a copy of the course material they miss, inquire about the announcements made in class, or seek out-of-class help from the instructor.

- **Weekly short quizzes**

Towards the end of each Friday class, there will be a 10-minute multiple-choice quiz for a total of 7 quizzes in the whole semester. These quizzes, designed in the same format as a typical Exam IFM question, are meant to motivate you to study regularly and keep up with the course material. All quizzes are closed-book and you are not allowed to bring your own formula sheets (the same applies to the real IFM exam as well!). Only calculators as listed on Point 9 of the SOA exam rules and regulations/instructions (see <https://www.soa.org/Files/Edu/edu-rules-reg-instructions.pdf>) are permitted. For students’ guidance, illustrative solutions will be handed out the following Monday.

6 Tentative Teaching Schedule

The approximate schedule overleaf will be updated as needed as the semester unfolds.

| Teaching Week | Class | Date | Topic ¹ |
|---------------|-------|----------------------|-----------------------------------|
| 8 | 1 | March 4, 2019 (Mon) | Course introduction and Chapter 1 |
| | 2 | March 8, 2019 (Fri) | Chapter 1, Quiz 1 |
| 9 | 3 | March 11, 2019 (Mon) | Chapter 1 |
| | 4 | March 15, 2019 (Fri) | Chapter 1, Quiz 2 |
| — | — | March 18, 2019 (Mon) | (Spring Break—No class!) |
| | — | March 22, 2019 (Fri) | |
| 10 | 5 | March 25, 2019 (Mon) | Chapter 2 |
| | 6 | March 29, 2019 (Fri) | Chapter 2, Quiz 3 |
| 11 | 7 | April 1, 2019 (Mon) | Chapter 2 |
| | 8 | April 5, 2019 (Fri) | Chapter 2, Quiz 4 |
| 12 | 9 | April 8, 2019 (Mon) | Chapter 3 |
| | 10 | April 12, 2019 (Fri) | Chapter 3, Quiz 5 |
| 13 | 11 | April 15, 2019 (Mon) | Chapter 3 |
| | 12 | April 19, 2019 (Fri) | Chapter 3, Quiz 6 |
| 14 | 13 | April 22, 2019 (Mon) | Chapter 4 |
| | 14 | April 26, 2019 (Fri) | Chapter 4, Quiz 7 |
| 15 | 15 | April 29, 2019 (Mon) | Chapter 4 |
| | 16 | May 3, 2019 (Fri) | Chapter 4 / Review |
| ⋮ | ⋮ | ⋮ | ⋮ |
| — | — | July 9–15, 2019 | July 2019 Exam IFM |

More about the Instructor (“Shameless” self-introduction...)

Professor Ambrose Lo was born, raised, and educated in Hong Kong. He earned his B.S. in Actuarial Science (first class honors) and Ph.D. in Actuarial Science from The University of Hong Kong in 2010 and 2014, respectively. He joined the Department of Statistics and Actuarial Science at The University of Iowa in August 2014 as an Assistant Professor of Actuarial Science. He is a Fellow of the Society of Actuaries (FSA) and a Chartered Enterprise Risk Analyst (CERA). His research interests lie in dependence structures, quantitative risk management as well as optimal (re)insurance. His research papers have been published in top-tier actuarial journals, such as *ASTIN Bulletin: The Journal of the International Actuarial Association*, *Insurance: Mathematics and Economics*, and *Scandinavian Actuarial Journal*.

Besides dedicating himself to actuarial research, Ambrose attaches equal importance to teaching, through which he nurtures the next generation of actuaries and serves the actuarial profession. He has taught courses on financial derivatives, mathematical finance, life contingencies, credibility theory, advanced probability theory, and regression and time series analysis. His emphasis in teaching is always placed on the development of a thorough understanding of the subject matter complemented by concrete problem-solving skills. He is a coauthor of the *ACTEX Study Manual for SOA Exam SRM* (January 2019 edition) and the sole author of the *ACTEX Study Manual for CAS Exam MAS-I* (Spring 2019 Edition) and the textbook *Derivative Pricing: A Problem-Based Primer* (2018) published by Chapman & Hall/CRC press.

¹Refer to the course notes, not Berk and DeMarzo (2017)

College of Liberal Arts & Sciences: Policies and Procedures

Administrative Home

The College of Liberal Arts and Sciences (CLAS) is the administrative home of this course and governs its add/drop deadlines, the second-grade-only option, and other policies. These policies vary by college.

Electronic Communication

Students are responsible for official correspondences sent to their UI email address (uiowa.edu) and must use this address for all communication within UI (Operations Manual, III.15.2).

Accommodations for Disabilities

UI is committed to an educational experience that is accessible to all students. A student may request academic accommodations for a disability (such as mental health, attention, learning, vision, and physical or health-related condition) by registering with Student Disability Services (SDS). The student should then discuss accommodations with the course instructor (<https://sds.studentlife.uiowa.edu/>).

Nondiscrimination in the Classroom

UI is committed to making the classroom a respectful and inclusive space for all people irrespective of their gender, sexual, racial, religious or other identities. Toward this goal, students are invited to optionally share their preferred names and pronouns with their instructors and classmates. The University of Iowa prohibits discrimination and harassment against individuals on the basis of race, class, gender, sexual orientation, national origin, and other identity categories set forth in the University's Human Rights policy. For more information, contact the Office of Equal Opportunity and Diversity at diversity@uiowa.edu or diversity.uiowa.edu.

Academic Integrity

All undergraduates enrolled in courses offered by CLAS have, in essence, agreed to the College's Code of Academic Honesty. Misconduct is reported to the College, resulting in suspension or other sanctions, with sanctions communicated with the student through the UI email address.

CLAS Final Examination Policies

The final exam schedule for each semester is announced around the fifth week of classes; students are responsible for knowing the date, time, and place of a final exam. Students should not make travel plans until knowing this final exam information. No exams of any kind are allowed the week before finals.

Making a Complaint

Students with a complaint should first visit with the instructor or course supervisor and then with the departmental executive officer (DEO), also known as the Chair. Students may then bring the concern to CLAS.

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 must uphold the UI mission and contribute to a safe environment that enhances learning. Incidents of sexual harassment must be reported immediately. For assistance, definitions, and the full University policy, see <https://osmrc.uiowa.edu/>.

****END OF COURSE SYLLABUS****