



Actuarial Science 325

Theory of Interest/Mathematics of Finance

(see Course Descriptions for the applicable academic year: <http://www.ucalgary.ca/pubs/calendar/>)

Syllabus:

This course covers most of the topics in the interest rate theory section of Society of Actuaries (SOA) Exam FM. The topics to be included are

- Simple and compound interest
- Force of interest
- Annuities
- Spot rates, forward rates and term structure
- Rate of return
- Loans and cost of borrowing
- Bonds and bond pricing and bond yields
- Durations and convexities

Time permitting: Immunization and dedication

Instructors may choose any one of the texts given below:

Option 1: Broverman, S.A., Mathematics of Investment and Credit (Fifth Edition), 2010, ACTEX Publications:

- Chapter 1 (1.1-1.7)  
Chapter 2 (2.1 -2.4 excluding 2.4.2 and 2.4.3)  
Chapter 3 (3.1-3.3, excluding 3.2.1 and 3.2.2)  
Chapter 4 (4.1-4.3.1)  
Chapter 5 (5.1-5.3 excluding 5.1.4 and 5.3.2)  
Chapter 6 (6.1-6.3 excluding 6.2)  
Chapter 7 (7.1)  
Time Permitting: Chapter 7.2 , Chapter 8 (8.1, 8.3.1 and 8.4.1–8.4.2)

Option 2: Daniel, J.W., and Vaaler, L.J.F., Mathematical Interest Theory (Second Edition), 2009,

- Chapter 1 (1.3-1.12, 1.14)  
Chapter 2 (2.2-2.7)  
Chapter 3 (3.2-3.9, 3.11, 3.13)  
Chapter 4 (4.2-4.6)  
Chapter 5 (5.2-5.4)  
Chapter 6 (6.2-6.6, 6.9)  
Chapter 7 (7.1)  
Chapter 8 (8.3)  
Chapter 9 (9.1-9.5)  
Time Permitting: Chapter 9.4

Option 3: Kellison, S.G., The Theory of Interest (Third Edition), 2008, Irwin/McGraw-Hill:

Chapter 1 (1.2-1.10)  
Chapter 2 (2.3-2.6)  
Chapter 3 (3.2-3.8)  
Chapter 4 (4.2-4.9)  
Chapter 5 (5.2-5.6)  
Chapter 6 (6.2-6.7, 6.10)  
Chapter 7 (7.2-7.7)  
Chapter 9 (9.4)  
Chapter 10 (10.2-10.5)  
Chapter 11 (11.2-11.6)  
Time Permitting Chapters 11.7-11.8

Option 4: Ruckman, C.; and Francis, J., Financial Mathematics: A Practical Guide for Actuaries and other Business Professionals (Second Edition), 2005, BPP Professional Education:

Chapter 1  
Chapter 2  
Chapter 3 (3.1-3.9)  
Chapter 4 (4.1-4.7)  
Chapter 5  
Chapter 6 (6.1-6.3 excluding 6.1.6-6.1.7)  
Chapter 7 (7.1-7.6)  
Chapter 8 (8.1-8.3)  
Time permitting: Chapter 7 (7.7-7.9)

Option 5: Chan, Wai-Sum, and Tse, Yiu-Kuen, Financial Mathematics for Actuaries, Updated Edition, 2013, McGraw-Hill Education (Asia)

Chapter 1  
Chapter 2  
Chapter 3  
Chapter 4  
Chapter 5  
Chapter 6  
Chapter 7  
Chapter 8.1-8.4  
Time permitting: chapter 8.5-8.8

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