

Math418B Financial Mathematics II
Winter 2015
1 – 1:50 MWF Bouillon 210

Instructor: Cen-Tsong Lin
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Office hours: 10:00 – 10:50 M – F or by appointment

Prerequisite: Math418A

Text: *Mathematics of Investment and Credit* (5th Edition), 2010, by Broverman, S.A.

Course Goal:

The goal of this course is to provide students an understanding of fundamental concepts of financial mathematics, and how those concepts are applied in calculating present and accumulated values for various streams of cash flows as a basis for future use in: reserving, valuation, pricing, asset/liability management, investment income, capital budgeting and valuing contingent cash flows. The students will also be given an introduction to financial instruments, including derivatives, and the concept of no-arbitrage as it relates to financial mathematics.

Learning outcomes:

1. Students will know definitions of key **terms of financial mathematics**: inflation; rate of interest, term structure of interest rates, force of interest; equivalent measures of interest; yield rate, principal; equation of value; present value; future value; current value; net present value, accumulation function; discount function; annuity certain, perpetuity; stocks; bonds; other financial instruments such as mutual funds, and guaranteed investment contracts.
2. Students will understand key **procedures of the financial mathematics**: determining equivalent measures of interest; discounting; accumulating; determining yield rates; estimation the rate of return on a fund; amortization.
3. Students will know definitions of key **terms of modern financial analysis** at an introductory and intuitive level, and be able to complete basic calculations involving such terms: yield curves, spot rates, forward rates, duration, convexity, and immunization.
4. Students will know definitions of key terms of financial economics at an introductory level: derivatives, forwards, futures, short and long positions, call and put options, spreads, collars, hedging, arbitrage, and swaps.

Course outlines: (continue from Math 418A)

- Bond valuation (from section 4.1.2)
- Measuring the rate of return of an investment (chapter 5)
- The term structure of interest rates (chapter 6)
- Cashflow duration and immunization (chapter 7)
- The dividend discount model of stock valuation (8.1)

Grading Policy

- Three tests: 100 points each, tentative schedule: 1/23, 2/13, 3/6
 - Homework assignments
 - Final exam (125 points): Monday, 3/16/2015, 12:00 – 2:00 PM
- Total 425 points + homework assignment total points

Note:

- Homework assignment will be assigned daily and also posted on Canvas system. No late homework will be accepted.
- A TI BAI plus calculator is highly recommended for this course.
- The official information about Exam FM is available online: <https://www.soa.org/Files/Edu/2015/edu-2015-04-exam-fm-syllabus.pdf>