

Math418A Financial Mathematics I  
Fall 2014  
12 – 12:50 MWF Bouillon 106

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

**Prerequisite:** Math173

**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:**

- i. Interest rate measurement
- ii. Valuation of annuities: accumulated value; present value; level payments; non-level payments; continuous annuities.
- iii. Loan repayment: amortization method, sinking-fund method
- iv. Bond valuation

**Grading Policy**

Three tests: 10/10/2014, 10/31/2014 and 11/21 (all Friday)	60%
Homework assignments	15%
Final exam: Thursday, 12/11/2014, 12:00 – 2:00 PM	25%
Total	100%

Note:

- i. A Texas Instruments **BAIL Plus** calculator is recommended for this course.
- ii. Homework will be assigned daily throughout the quarter; these assignments are due one week after they are given.