

SU Department of Mathematics and Computer Syllabus (tentative)
Math 215 Introduction to Financial Mathematics

Objective: To provide an understanding of the fundamental concepts of financial mathematics, and how those concepts are applied in calculating present and accumulated values for various streams of cash flows for use in: amortizing loans, pricing financial instruments, valuing assets and liabilities, and personal finance.

Intended for: Math majors electing the actuarial science track and others interested in the application of mathematics to finance.

Prerequisite: Math 160 or the equivalent.

Textbook: *Chan, Wai-Sum, and Tse, Yiu-Kuen, Financial Mathematics for Actuaries, Second Edition, 2018, World Scientific Publishing Company, ISBN: 978-9813224674*

<i>Topics</i>	<i>Hours</i>
<p style="margin: 0;"><i>Interest rates, time value of money, and annuities</i> Definition of the accumulation function; nominal and annual rates of interest and discount; discounting and accumulating a single payment or a series of payments; present and accumulated values of level annuities; non-level annuities.</p>	15
<p style="margin: 0;"><i>Applications of cash flow valuation: loans and bonds</i> Net present value and applications; amortizing of loans; the sinking fund approach; pricing bonds.</p>	8
<p style="margin: 0;"><i>Term structure and determinants of interest rates</i> Definition of the internal rate of return; time-weighted and dollar-weighted rate of return; net present value; yield curve; spot rates; forward rates; yield to maturity; cash flow valuation; determinants of interest rate.</p>	6
<p style="margin: 0;"><i>Asset-liability management</i> Matching asset and liability cash flows; durations; convexity; approximations using duration and convexity; duration of portfolios; immunization; stocks and other investments.</p>	7
<p style="margin: 0;"><i>Interest Rate Swaps</i> Introduction of derivative securities; interest rate swaps; terminology and examples; calculation of swap rate; market value of a swap.</p>	4
<p style="margin: 0;"><i>Tests</i></p>	4
<p style="margin: 0;"><i>Excel+VBA projects</i></p>	12

Total: 56

Evaluation

Tests 30%
 Quizzes and Projects (Excel) 40%
 Final 30%