

SU Department of Mathematics and Computer Syllabus

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. And to provide a basic understanding of financial derivatives such as call and put options.

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.

Resources: *Financial Mathematics* by Ruckman and Francis, BPP Professional Education, 2nd edition, 2008.
Financial calculator (TI BA II Plus) and Excel software (accessible via the SU computer network)

Topics	Hours
<i>Interest rates, accumulating, discounting, and annuities</i>	12
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.	
<i>Applications of cash flow valuation</i>	9
Net present value and project appraisal; amortizing of loans; the sinking fund approach; pricing stocks and bonds; immunization of a portfolio of assets and liabilities.	
<i>Term structure of interest rates</i>	3
Definition of the yield curve; spot rates; forward rates; yield to maturity; cash flow valuation.	
<i>Financial derivatives and derivative strategies</i>	6
Introduction to forwards, call options, and put options; payoff for a portfolio of options; using options as insurance.	
<i>Risk management</i>	9
Definition of floors, caps, spreads, collars (payoffs and profits); synthetic stocks and options; put-call parity; use of forwards, futures and swaps to manage risk.	
<i>Tests</i>	3
<i>Problem presentations, Excel spreadsheet construction</i> (4 th class hour/week)	14
	Total: 56

Evaluation

Tests	40%
Oral presentations	20%
Quizzes and Projects (Excel)	20%
Final	20%