

Math 395
Financial Mathematics – The Theory of Interest and Investment
TR 2:15 – 3:30 Jepson Hall 109
Spring 2009

Instructor: Dr. Jason Owen
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Office Hours: TBD

Materials:

- *Financial Mathematics: A Practical Guide for Actuaries and Business Professionals*, 2nd Edition (2005) Ruckman/Francis, BPP Professional Ed.
- *Financial Mathematics: Derivatives*, course notes published by BPP Professional Ed.
- a scientific or business calculator

Prerequisite: Math 212 (Calculus II) or 232 (Scientific Calculus). However, the more math courses you have beyond this, the better.

Description: The purpose of this course is to develop a practical understanding of financial mathematics and interest theory in both finite and continuous time. This theory includes the fundamentals of how annuity functions are applied to the concepts of present and accumulated value for various cash flow streams, and how this is used for future planning in valuation, pricing, duration, and investment. In addition, short sales (including yield) and derivatives for financial risk management will be covered. The class schedule on the next page gives a detailed listing of all of the course topics.

Assignments and Grading:

- Three exams: 55.5%
- Homework: 14.5%
- Final exam: 30%

90-100 = A (excellent), 80-89 = B (good), 70-79 = C (average), 60-69 = D (poor), 0-59 = F (failing) +/- assigned for borderline grades (usually $\pm 1.5\%$).

Important Dates: Last day to drop: February 27th Last Day of Class: April 24th
Spring Break: March 9th - 13th Final Exam: Wed., Apr. 29th 9:00 - 12:00

Class Policies:

- Attendance is expected. If you must miss a class (not recommended), let me know ahead of time. You are responsible for making up any work you miss if you are not in class. I reserve the right to punish a serious abuse of privileges (I will warn you before I do so).

- On some homework assignments, working together is allowed; on others, you must work alone and they will be pledged. I will indicate this on each assignment.
- Late assignments are *not accepted* except under extreme circumstances and with sufficient notice.
- Students are expected to abide by the official University Policy on Academic Honesty

Class Schedule:

We will stick as closely as possible to the following calendar. Prior to each class meeting, I will expect that you have already read the sections that will be covered for the day.

Week	Class	Date	Text sections	Topics/Content
1	1	T: Jan. 13	1.1, 1.2, 1.3	interest (simple, compound)
	2	R: Jan. 15	1.4, 1.5, 1.6	accumulated/present value, discount
2	3	T: Jan. 20	1.7, 1.8, 1.9	force of interest: constant/varying
	4	R: Jan. 22	2.1, 2.2	annuity-immediate/due
3	5	T: Jan. 27	2.3, 2.4	deferred, cont. payable annuities
	6	R: Jan. 29	2.5, 2.6	perpetuities, equations of value
4	7	T: Feb. 3	3.1 and review	increasing annuity-immediate
	8	R: Feb. 5	EXAM 1	CHAPTERS 1, 2
5	9	T: Feb. 10	3.1, 3.2, 3.3	increasing annuity-immediate/due
	10	R: Feb. 12	3.4, 3.5, 3.6	decreasing annuities, cont. payable
6	11	T: Feb. 17	3.7, 3.8, 3.9	continuously variable annuities
	12	R: Feb. 19	4.1, 4.2, 4.3	non-annual interest/discount, nominal rates
7	13	T: Feb. 24	4.4, 4.5	annuities payable <i>p</i> thly
	14	R: Feb. 27	Catch-up, review	
8	15	T: Mar. 3	EXAM 2	CHAPTERS 3, 4
	16	R: Mar. 5	5.1, 5.2	cash flow analysis, nominal/real interest
***	***	SPRING	SPRING	SPRING
***	***	BREAK	BREAK	BREAK
9	17	T: Mar. 17	5.3, 5.4	measuring interest (dollar/time weighted)
	18	R: Mar. 19	5.5	amortization
10	19	T: Mar. 24	5.6, 6.1, 6.2	sinking funds, financial instruments
	20	R: Mar. 26	6.2, 6.3	bond/stock valuation
11	21	T: Mar. 31	6.4, 6.5, course notes	short sales, derivatives
	22	R: Apr. 2	Catch up. review	derivatives
12	23	T: Apr. 7	7.1, 7.2, 7.3	duration
	24	R: Apr. 9	7.4, 7.5, 7.6	convexity
13	25	T: Apr. 14	7.7, 7.8, 7.9	immunization, dedication
	26	R: Apr. 16	8.1, 8.2	yield-to-maturity, spot rates
14	27	T: Apr. 21	8.3, 9.1, 9.3	forward rates, stochastic interest rates
	28	R: Apr. 23	9.3 and review	