Math 4453, Mathematical Interest Theory

Spring 2011 Course Information

Professor: Dr. Lisa Mantini, 410 Math Sciences, email mantini@math.okstate.edu, telephone 744–5777, web page http://www.math.okstate.edu/~mantini

Office Hours: TR 1:00 – 2:30 PM and by appointment. I am also available after class for at least 20–30 minutes daily.

Course Times: MWF 1:30 – 2:20 PM in MSCS 514.

Course Objectives: The aim of this course is to cover the mathematical theory of interest, including the topics required by actuaries, by others working in the financial industry, and by informed consumers. Topics will include the time value of money and of various investments, interest and discount rates, equations of value and yield rates, annuities, loans, amortization tables, and brief introductions to bonds, stocks, and arbitrage as time permits. Our course will cover most, but likely not all, of the content of the Society of Actuaries/Casualty Actuarial Society's exam on Financial Mathematics, Exam 2 (CAS) or Exam FM (SOA). More information on preparpation for the Actuarial exams and on actuarial careers may be obtained at http://www.beanactuary.org/exams.

Prerequisites: Math 2153, Calculus II, is the official prerequisite for this course. Some knowledge of economics and/or finance and mathematical maturity (including ability to read and interpret word problems) will be helpful.

Required Text/Tools: The text *Mathematical Interest Theory*, by James Daniel and Leslie Vaaler, is required. The *Student Solutions Manual* is optional. The use of a financial calculator is required. I recommend the TI BA II Plus or TI BA II Plus Professional, for which operating instructions are given in our text, but you may also use the BA 35, TI-30Xa, TI-30X II, or TI-30XS. In this class you will be permitted to use two calculators on exams, usually one financial calculator and one graphing calculator.

Course Requirements: The requirements for this course are as follows:

- Two in-class exams, worth 150 points each and tentatively given on
  - Friday, February 11;
  - Friday, March 25;

  These exams allow the use of a calculator but no other aids.

- Homework, worth 150 points (approximately 11-12 assignments worth 15 points each, with the 10 best counting towards your grade);

- Final exam, worth 150 points, given on Wednesday, May 4, from 2:00 – 3:50 PM. Note that the final exam is not comprehensive but emphasizes material from the end of the course. This exam allows the use of a note card with formulas.

Homework: Almost every section of the text has corresponding homework exercises, found in the last section of each chapter. All exercises are answered in the back of the text, and odd numbered exercises are answered fully in the Student Solutions Manual. I

will provide fully worked solutions for most even-numbered exercises. The assignments I collect will consist of selected problems from the text with possibly extra problems that I may hand out as needed. Please note that I care a great deal about the correct *answers* as well as the correct *methods* being used. Partial credit for incorrect solutions is not guaranteed.

Grading: There are 600 total points available in the course. Preliminary grade cutoffs, which I reserve the right to lower, are as follows:

- 537 points (89.5%) guarantees an A in the course,
- 477 points (79.5%) guarantees a B,
- 417 points (69.5%) guarantees a C.

Makeup exams: Makeup exams will be given **only** for very serious, unavoidable extenuating circumstances, **only** if you notify me as soon as possible after the missed exam.

Drop Policy: The last day to drop the course with a full tuition refund and no grade is Tuesday, January 18. The last day to drop the course with a half tuition refund and a grade of W is Friday, January 21. The last day to drop the course with an automatic grade of W is Friday, April 8.

Special Accommodations: If any member of this class feels that he/she has a disability and needs special accommodations of any nature whatsoever, I will work with you and the Office of Disabled Student Services, 326 Student Union, to provide reasonable accommodations to ensure that you have a fair opportunity to perform in this class. Please advise me of such a disability and the desired accommodations at some point before, during, or immediately after the first class.

Academic Integrity: All members of the Oklahoma State University community are entrusted with academic integrity, which encompasses the fundamental virtues of honesty, trust, respect, fairness, and responsibility. You are expected to demonstrate academic integrity through

- understanding and upholding the University's academic integrity guidelines;
- presenting only your own work for evaluation;
- appropriately citing the words and ideas of others;
- protecting your own work from misuse;
- accepting responsibility for your own actions.

The minimum penalty for a first violation is no credit for that assignment. The minimum penalty for a second violation, even if the first violation occured in a prior year or in a different course, is the grade of "F!" (F-shriek) on the transcript. Further violations may warrant suspension from the University. Please read the policies at http://academicintegrity.okstate.edu very carefully.

Specifically, for this course, collaborative discussions about the homework are allowed, but you should write up your own solutions independently. You should not show your written solutions to other students or read solutions written by someone else before

turning in your homework. Significant ideas that came from someone else should be acknowledged in a footnote (no penalty).

Tentative Assignment List: Here is a tentative calendar of sections to be covered each week (might be updated later) and problems assigned from those sections. I may supplement these lists of problems with others, to be distributed later. All exercises in the text are answered in the back of the book, and odd-numbered problems are fully answered in the Student Solutions Manual. I will post solutions on our D2L site.

The TE assignments are Technology Extras, where we apply computational technology to solve financial problems.

Asn.	Due	Problems Assigned
1	Jan 21	**1.3**: 2, 4, 8; **1.4**: 4, 5, 6; **1.5**: 2, 6, 8, 10; **1.6**: 1, 2, 3, 4, 5
2	Jan 28	**1.7**: 4, 6, 7, 8; **1.8**: 2, 4; **1.9**: 2, 4, 6; **1.10**: 2, 4, 6; **1.11**: 2, 3
3	Feb 4	**1.12**: 2, 8, 10; **1.14**: 4, 5, 6; **2.2**: 2, 4, 5
Exam 1	Feb 11	Covers problem sets 1–3
4	Feb 18	**2.3**: 4, 6, 10, 12; **2.4**: 2, 4, 6, 8; **2.5**: 2;
TE1	Feb 18	Do 2.4.9 two ways, using list on graphing calculator and
		using Cash Flow worksheet on financial calculator.
5	Feb 25	**2.6**: 1, 3, 4; **2.7**: 1, 2, 3
6	Mar 4	**3.2**: 2, 3, 4, 6, 7; **3.3**: 2, 4, 8, 10
7	Mar 11	**3.4**: 1, 3, 4; **3.5**: 2, 4, 5; **3.6**: 1, 2, 3
	Mar 18	Spring Break
Exam 2	Mar 25	Covers problem sets 4–7
8	Apr 1	**3.7**: 1, 2, 4, 7; **3.8**: 1, 2, 4
9	Apr 8	**3.9**: 1, 2, 4, 6; **3.10**: 3, 7; **3.13**: 1, 2
10	Apr 15	**4.2**: 1, 3; **4.3**: 1, 2, 5; **4.6** 1, 2, 3, 5, 6; **4.5**: 5; **4.7**: 2
11	Apr 22	**5.2**: 1, 3, 4; **5.3**: 1, 2, 5; **5.5**: 1, 2
TE2	Apr 22	Do Excel spreadsheets for assigned problems from Chapter 5
12	Apr 29	**6.2:** 1–6; **6.3:** 1–3; **6.4:** 2, 3
Final	May 4	Covers problem sets 8–12 (one $4'' \times 6''$ notecard allowed)