Math 420 - Fall 2014

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Office: Blocker 221A
Office hours: T 10am-12pm and W 1:45pm-2:45pm
and by appointment

Class Time and Location: Math 420-500 meets MWF 12:40pm-1:30pm in BLOC 161 starting September 1, 2014.

Catalog Title and Description: (CREDIT 2.0) *Applications of Actuarial Science II* - Use of mathematical and statistical methods to price various financial instruments, such as bonds; understanding how the term structure of interest rates affect the price of these instruments. Prerequisite: MATH 325 or concurrent enrollment, or approval of instructor.

Course Objectives: The goal of this course is to prepare students for the Society of Actuaries Exam 2/FM. Upon completion of this course, students will have gained a deeper understanding and practice in appications of financial mathematics, including the time value of money, annuities and non-contingent cash flows, loans, bonds, general cash flows and portfolios, and immunization. Students will also gain a deeper understanding and an ability to apply concepts of financial economics, specifically in the areas of general derivatives, options, forwards and futures, swaps, and hedging and investment strategies. Note: A tentative schedule for this course, including the topics to be reviewed, can be found at the end of this handout and on my web page.

Requirements: All students are required to have one of the following two financial calculators: BA II Plus or BA II Plus Professional Edition. Since the Society of Actuaries allows two calculators to be taken into the exam room, it is also recommended that each student have a TI-30XS Multiview calculator. Other calculators are allowed by the SOA, but these have the most functionality and are easiest to use. **Only calculators that are approved by the Society of Actuaries for use on Exam FM will be allowed to be used on quizzes, assignments, and exams in this class.**

All students will be required to purchase access to WebAssign to complete online homework for this class.

Although it is not required, all students registered for Math 420-500 are encouraged to sit for the Society of Actuaries Exam FM in December 2014. The registration deadline for this exam is October 29, 2014, and the registration fee is $225. If you are a MATH or APMS major and you pass Exam FM (or any other actuarial exam), the Department of Mathematics will reimburse you for this fee. More details will be provided on the first day of class.

Textbook & Study Manual: Since Math 325 is a co-requisite (or prerequisite), you should already have the following text:

The Theory of Interest, 3rd edition, by Stephen G. Kellison. Published by McGraw-Hill. ISBN-13: 978-0-07-338244-9, ISBN-10: 0-07-338244-2.

Reading assignments from this text will be given weekly. Also, if you plan to take Exam FM, I highly recommend that you purchase a study manual to help you prepare for the exam. The following study manuals have been helpful to many students who have taken Exam FM:

> *ACTEX FM Study Manual*, 2014 Edition, by Hassett, Ratliff, Coombs, and Steeby. This study manual can be purchased at www.actuarialbookstore.com for $120.
>
> *ASM Study Manual for Exam FM/Exam 2*, 11th edition, by Cherry and Gorvett. This study manual can be purchased at www.actuarialbookstore.com for $160.

Email Policy: Check your TAMU email account and WebAssign's announcement center regularly. You are responsible for any information I send via email or announcement. If you send an email to me, be sure to include your full name and Math 420 in the message.

Cell Phone/Laptop Computer Policy: As a courtesy to me and your classmates, all cell phones and laptop computers (and other electronic devices) must be OFF and put away during lecture. If you disrupt class or distract your neighbor with your cell phone or other electronic device, you will be asked to leave class.

Grading Policy: Grades will be calculated according to the following percentages:

Online Assignments	40%		A = 90-100%
In-class Quizzes	25%		B = 80-89%
Final Exam	25%		C = 70-79%
Class Participation/Attendance	10%		D = 60-69%
			F = below 60%

Online Assignments: All students will be required to purchase access to WebAssign for the completion of online homework assignments. Homework will usually be due on Mondays (see schedule for exact dates). There is no time limit for these assignments, and students will have two attempts for each question.

During the last two weeks of the course, students will complete three practice exams in WebAssign. Each will consist of 10 questions from previous actuarial exams, and there will be a 60-minute time limit. Only one attempt per question will be allowed.

Special thanks to Dr. May Boggess for creating the online homework assignments for Math 419 and Math 420.

In-class Quizzes: Announced and unannounced quizzes will be given throughout the semester during lecture. Each quiz will be cumulative, meaning that all material covered before the day of a quiz is fair game for that quiz.

Final Exam: Exam FM is a 3-hour, 35-question exam. Since the goal of Math 420 is to prepare students for this exam, our 2-hour final will consist of 23 multiple choice questions similar to those that appear on Exam FM. Our final exam will be on Monday, December 15, from 10:30am to 12:30pm. I will also try to offer an alternative time on Thursday, December 11, for those who would like to take the final exam early. This will depend upon room availability.

Class Participation and Attendance: One hundred points will be awarded for class participation and attendance, and the final score in this category will count as 10% of the overall course average. Attendance

is mandatory, and the roll will be taken at each class period. Although missing class is highly discouraged, each student will be allowed one unexcused absence. Each additional unexcused absence will result in a 30-point deduction in the class participation grade. Arriving late or leaving class early will count as one-third to one-half of an unexcused absence. Missing more than 25 minutes of a class period will count as an absence. To receive full points for class participation, students are expected to arrive to class on time, stay the entire period, take notes and practice using their calculators as the instructor goes through practice problems, and contribute to class discussion.

Make-up Policy: No make-ups will be given without written evidence of an official University excused absence. (See *University Student Rules*.) According to Section 7.3 of the *University Student Rules*, for an absence to be considered excused,

> the student must notify his or her instructor in writing (acknowledged e-mail message is acceptable) prior to the date of absence if such notification is feasible. In cases where advance notification is not feasible (e.g. accident or emergency) the student must provide notification by the end of the second working day after the absence. This notification should include an explanation of why notice could not be sent prior to the class.

If no such notice is given, the rights to a make-up are forfeited. In addition (and also in accordance with *University Student Rules*), a **written** excuse must be presented upon return to class. Specifically, in the case of illness or injury, students are required to obtain a confirmation note from a health care professional affirming date and time of a medical office visit regarding the illness or injury. I will NOT accept the Explanatory Statement for Absence from Class form as sufficient written documentation of an excused absence.

Scholastic Dishonesty: You are encouraged to work together on the homework assignments, but do not copy another student's work or allow another student to complete your homework assignments for you. Always abide by the Aggie Code of Honor: *An Aggie does not lie, cheat, or steal or tolerate those who do.* Please refer to Honor Council Rules and Procedures at http://www.tamu.edu/aggiehonor for more information on academic integrity and scholastic dishonesty. **I have served as a member of the Aggie Honor Council, so I take these matters very seriously.**

Extra Help:

- **Your Instructor:** I want each and every one of my students to be successful in this class and to pass Exam FM in December. Please feel free to ask questions in class. If you need more help, come by my office during office hours or make an appointment to see me. Remember, I am here to help, but I cannot do that if I don't know that there is a problem.

- **Your Classmates:** Get to know your classmates. Form study groups and/or utilize the discussion board within WebAssign to help each other out on the homework assignments.

- **Practice:** The best way to prepare for an actuarial exam is to practice, practice, practice, and then practice some more. I strongly recommend that you practice problems **DAILY**. If you find that you struggle with certain problems the first time you work them, be sure to work them again AND work other problems that are similar. A set of 57 practice problems with video solutions, along with a computer-based practice exam can be found online at soa.org, and for those who are looking for even more practice problems, you can purchase one of the following study manuals (as mentioned earlier):

ACTEX FM Study Manual, 2014 Edition, by Hassett, Ratliff, Coombs, and Steeby. This study manual can be purchased at www.actuarialbookstore.com for $120.

ASM Study Manual for Exam FM/Exam 2, 11th edition, by Cherry and Gorvett. This study manual can be purchased at www.actuarialbookstore.com for $160.

ADA Policy Statement: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities, in Room B118 of the Cain Hall or call 845-1637.

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Weekly Lecture Schedule: Roughly speaking, we should review the following material on the following schedule:

Week of Monday	Topics
Sept. 1	Interest
Sept. 8	Level Annuities
Sept. 15	Varying Annuities
Sept. 22	Loans
Sept. 29	Bonds
Oct. 6	Net Present Value & Internal Rate of Return
Oct. 13	Spot Rates & Forward Rates
Oct. 20	catch up
Oct. 27	Derivatives & Options
Nov. 3	Parity & Hedging
Nov. 10	Futures & Swaps
Nov. 17	catch up
Nov. 24	Duration & Immunization
Dec. 1	Review
Dec. 8	Review