MATH 500: Mathematical Theory of Interest, Fall 2020

Lectures: Tuesday/Thursday, 9:30-10:45, Cardwell 120.
Instructor: Joana Amorim, jamorim@ksu.edu. Office: Leasure 14.

Course Goals: This course covers standard topics in Financial Mathematics. We will discuss interest rates and the time value of money, the valuation of annuities, stocks and bonds, loans and their repayment, portfolios and their immunization, swaps and determinants of interest rates. The main objective herein is to highlight many of the themes found on the Financial Mathematics Exam (Exam FM) regularly offered by the Society of Actuaries (SOA). We will aim to cover the totality of the content the syllabus that can be found here: https://www.soa.org/globalassets/assets/files/edu/2020/2020-10-exam-fm-syllabi.pdf
See the page “Schedule of classes” on canvas for the tentative weekly course outline.

DO NOT BUY THE BOOK BEFORE CLASSES START. I have negotiated free access to the digital version of the book for all of the students this fall. I will explain how you will get access to the book during our first lecture.

Required Software: We will be using Academic Goal, from Actex, for homework and quizzes among other things. There will be no cost for you this semester to use this tool. I will give you instructions about how to access it during our first class.

Calculator: You will need to have a Texas Instruments BA II Plus Financial Calculator. The BA II Plus is allowed on Exam FM by the SOA and has all the features that we need. This calculator is really useful and I will teach you how to use it to solve problems in the class. There are problems that you can not solve without a financial calculator. You may not use a cellphone on any in-class evaluations.

Website: All information and material related to the course, such as homework assignments, lecture notes, grades and announcements will be posted on K-State Canvas.

Evaluation:
- Homework: 22%
- Summary of material/formula sheet: 5%
- Class engagement: 5%
- Mid-term 1: 23%
- Mid-term 2: 23%
- Final: 22%
**Exams:** There will be two (in class) midterm exams during the semester and one final (cumulative) exam. The final and at least one mid-term must be taken in order to receive a grade A-D.

- Midterm 1  September 24 (Thursday), in class: no notes/formula sheet allowed.
- Midterm 2  November 5 (Thursday), in class: no notes/formula sheet allowed.
- Final  December 9 (Wednesday), 2:00 - 3:50 pm ONLINE: open book+ oral follow-up

**Homework:**

- All homework is due on Tuesdays by 6 pm. **All submissions will be made online using Crowdmark.**

- Weekly written homework assignments will be posted on Canvas and use GOAL exercises. Late homework will not be accepted. There will be 12 assignments and the two lowest scores will be dropped.

- Please always write legibly and present your solutions in an organized way. Write your name at the top of the front page and staple your homework.

- Please put your solutions in the exact order of problems in which they were assigned.

- For full credit, show your work in detail.

**Summary of Material/formula sheet:** you will be asked to maintain a summary of material/formula sheet during this course- this will help you to be on top of the many formulas you need to know for the FM exam. You will need to submit the most up to date version weekly with your homework. You will receive feedback weekly to help you build the most useful version for your study. See the page “rubrics for class engagement and formula sheet” on canvas to know more about how points will be awarded.

**Class engagement:** 5 points will be awarded for class attendance, participation and weekly quiz’s results (there will be a very short (1 multiple choice) weekly quiz, usually during Thursday lecture). See the page “rubrics for class engagement and formula sheet” on canvas to know more about how points will be awarded.

**Useful drop dates:** September 8: last day to drop with a 100% refund. September 14: last day to drop with a 50% refund. September 21: last day to drop without a W being recorded. October 23: last day to drop with a W being recorded.

**Information and Resources:** Exam FM is offered on a regular basis as a “Computer Based Test” (CBT) through the SOA. Currently, it costs 250 dollars to register for a given testing window. Be advised that you will need to study additionally above-and-beyond this course alone. That said, it is possible to do that concurrently and pass Exam FM directly after our class in the December window. If you want to do this, the deadline to register is November 10th. Below are websites with more information about Exam FM and the actuarial sciences:

- Casualty Actuarial Society: [www.casact.org](http://www.casact.org)
**Statement Regarding Academic Honesty**: Kansas State University has an Honor and Integrity System based on personal integrity, which is presumed to be sufficient assurance that, in academic matters, one’s work is performed honestly and without unauthorized assistance. Undergraduate and graduate students, by registration, acknowledge the jurisdiction of the Honor and Integrity System. The policies and procedures of the Honor and Integrity System apply to all full and part-time students enrolled in undergraduate and graduate courses on-campus, off-campus, and via distance learning. A component vital to the Honor and Integrity System is the inclusion of the Honor Pledge which applies to all assignments, examinations, or other course work undertaken by students. The Honor Pledge is implied, whether or not it is stated: "On my honor, as a student, I have neither given nor received unauthorized aid on this academic work.” A grade of XF can result from a breach of academic honesty. The F indicates failure in the course; the X indicates the reason is an Honor Pledge violation.

**Statement Regarding Students with Disabilities** Students with disabilities who need classroom accommodations, access to technology, or information about emergency building/campus evacuation processes should contact the Student Access Center and/or their instructor. Services are available to students with a wide range of disabilities including, but not limited to, physical disabilities, medical conditions, learning disabilities, attention deficit disorder, depression, and anxiety. If you are a student enrolled in campus/online courses through the Manhattan or Olathe campuses, contact the Student Access Center at accesscenter@k-state.edu, 785-532-6441; for K-State Polytechnic campus, contact Julie Rowe, Diversity, Inclusion and Access Coordinator, at jarowe@ksu.edu or call 785-826-2971.

**Statement Defining Expectations for Classroom Conduct**: All student activities in the University, including this course, are governed by the Student Judicial Conduct Code as outlined in the Student Governing Association By Laws, Article V, Section 3, number 2. Students who engage in behavior that disrupts the learning environment may be asked to leave the class.

**Statement Regarding Wearing of Face Coverings**: To protect the health and safety of the K-State community, students, faculty, staff and visitors must wear face coverings over their mouths and noses while on K-State campuses in all hallways, public spaces, classrooms and other common areas of campus buildings, and when in offices or other work spaces or outdoor settings when 6-feet social distancing cannot be maintained. In addition, all students, faculty, and staff are required to take the COVID-19 and Face Mask Safety training. Employees who need reasonable accommodations and assistance related to required face coverings may contact the ADA coordinator at charlott@k-state.edu, and students needing accommodations may contact the Student Access Center at accesscenter@k-state.edu. In classrooms, faculty have the right to deny a student entry into the room if the student is not wearing a face covering.