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Math 2620: Financial Mathematics I - Fall 2023

Welcome to Math 2620!

This is an important foundational course in actuarial science and finance, with two principal goals for students. The first, and most important, goal is to master the fundamental concepts of financial mathematics, as listed below under "Learning Objectives." The second goal (for students majoring in Actuarial Science) is to begin preparation for SOA Exam FM (CAS Exam 2). However, this is not an exam preparation course; it covers many, but not all, of the topics for Exam FM/2. Math 3615 is the preparation course for Exam FM/2. In addition, this course, along with Math 3615, provides students an introduction to the mathematical principles underlying personal financial management.

Learning Objectives:

Knowledge of Key Terms

- Simple interest, compound interest, and discount
- Nominal and effective rates of interest and discount
- Force of interest
- Equivalent interest measures
- Equation of value
- Present value, future value, and current value
- Annuities and perpetuities
- Yield rates
- Bonds, mortgages, stocks, and other financial instruments
- Spot rates and forward rates (time permitting)
- Yield curves and the term structure of interest rates (time permitting)

Understanding of Key Procedures

- Calculate equivalent interest rates
- Calculate the value of an annuity or a perpetuity
- Calculate a present value or accumulated value (given a set of cash flows, the method of crediting interest, and the applicable interest rate(s))
- Calculate (using calculator functions) the yield rate for a given set of cash flows
- Calculate a loan payment amount and the corresponding loan amortization schedule
- Calculate the price and other attributes of bonds
- Calculate a spot rate curve, given a yield curve (time permitting)
- Calculate forward rates, given a spot rate curve (time permitting)

Syllabus - Fall 2023

Instructor:
Andrew Niedzielski (Prof. N), FSA, MAAA
Class time: Tu/Th 11:00 AM – 12:15 PM
Office website: https://uconn-cmr.webex.com/meet/asn11001
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Office: Monteith 204
Office Phone: (860) 486-4236

Office Hours/Availability: Office hours (subject to change) are Mondays 1-3 and Wednesdays 10-12 and 1:30-4:00PM in my office. With pre-arrangement, I can offer virtual support during in-person office hours, if that is more convenient. Whenever possible, please let me know ahead of time when you will be coming. I will also have some availability for office hours by appointment outside normally scheduled times. Email me if you need to see me outside of posted times. I strongly encourage students to take advantage of office hours. I observe a high correlation between attendance at office hours and academic improvement
.
I will generally reply to e-mails within 24 hours. Should you need a reply faster than that, please state this in the subject line.

Prerequisites:
Math 1132 or 1152 or 2142 (Calc II)

Course Website:
HuskyCT

Teaching Modality
This course will be taught in-person.

Required Course Materials:

1. ***Financial Mathematics: A Practical Guide for Actuaries and other Business Professionals (Second Edition), 2005, by Chris Ruckman & Joe Francis***

   This book will serve as the roadmap for my teaching. **I will be providing this book to you free of charge. No need to purchase this book. The book has also been posted electronically on HuskyCT.**

Optional Course Material: There are a variety of additional resources available to students, including but not limited to: The Infinite Actuary (TIA) online course, ACTEX Study Manual and GOAL question bank, ADAPT (Coaching Actuaries). Students often ask about additional sources for practice problems and these are all good options. There is a fee for these materials.

Calculator: A Texas Instruments **BA II Plus** calculator (recommended) or other Society of Actuaries' approved calculator is needed for this course. Only the **BA II Plus** or other approved calculator should be used on quizzes, tests, and the final exam for this course. Other approved calculators include the following models of Texas Instruments calculators:

- BA-35
- BA II Plus Professional
- TI-30Xa
- TI-30X II (IIS solar or IIB battery)
- TI-30XS MultiView (or XB battery)

I strongly suggest you use an approved calculator throughout the semester for homework and other problem solving as well in order to get used to the calculator you will use on the SOA/CAS exam if you plan on taking the exam eventually.

IMPORTANT: PLEASE HAVE YOUR BOOK AND CALCULATOR AVAILABLE FOR EVERY CLASS.

Grading Plan:

Homework = 20%
Test 1 = 15%
Test 2 & 3 @ 20% each = 40% total
Final Exam = 30%

You will note there is a total of 105% available. Your raw grade prior to any additional adjustments will be based on a denominator of 100%, thus there is a potential of up to 5 bonus points available to you.

Grading Scale:

Grade	Letter Grade	GPA
93-100	A	4.0
90-92	A-	3.7
87-89	B+	3.3
83-86	B	3.0
80-82	B-	2.7
77-79	C+	2.3
73-76	C	2.0
70-72	C-	1.7
67-69	D+	1.3
63-66	D	1.0
60-62	D-	0.7
<60	F	0.0

For additional information on undergraduate grading policies see here:
https://registrar.uconn.edu/grades/

Homework: The primary purpose of homework assignments is to help you gauge your level of comprehension of the material taught in class and to help prepare you to perform well on the tests. Homework assignments will be graded based on effort. Keeping up with homework assignments and putting in consistent effort will maximize your chances of success in this class and ultimately on the SOA exam.

Test Protocol: I will provide at least one week advance notice of an upcoming test (tentative dates are shown in the class schedule). All tests (including the final exam) will be multiple choice in nature (similar to the SOA/CAS exam). I expect everyone will take the test at the regularly scheduled time unless you have an extraordinary circumstance (such as illness). As soon as you know of your extraordinary circumstance, you must notify me through email so I can confirm the validity and we can schedule you to take the test at an agreed upon alternate time.

Final examination: Final examination week for the Fall 2023 semester takes place from Monday, December 11th, through Sunday, December 17th. Students are required to be available for their exam during the stated time. If you have a conflict with this time, you must visit the Dean of Students Office to discuss the possibility of rescheduling this exam.

Please note that vacations, previously purchased tickets or reservations, social events, misreading the exam schedule and over-sleeping are not viable excuses for missing a final exam. If you think that your situation warrants permission to reschedule, please contact the Dean of Students Office with any questions. Thank you in advance for your cooperation.

Cell Phone Usage: Please turn off or put your phone on "airplane" or "do not disturb" mode unless needed for emergencies. Many studies have found a cell phone to be an impediment to learning in class.

Technical Requirements

The software/technical requirements for this course include:

- HuskyCT/Blackboard (HuskyCT/ Blackboard Accessibility Statement, HuskyCT/ Blackboard Privacy Policy)
- Webex : https://confluence.uconn.edu/ikb/communication-and-collaboration/webex-video-conferencing/install-webex-webex-removal-tool
- Adobe Acrobat Reader (Adobe Reader Accessibility Statement, Adobe Reader Privacy Policy)
- Microsoft Office (free to UConn students through uconn.onthehub.com) (Microsoft Accessibility Statement, Microsoft Privacy Statement)

For information on managing your privacy at the University of Connecticut, visit the University's Privacy page.

Student Technology Training

Student technology training is now available in a new HuskyCT short course created by students for students. It will prepare you to use the IT systems and services that you will use throughout your time at UConn, whether learning online or on-campus. It is available at https://lms.uconn.edu/ultra/courses/_80016_1/cl/outline .

Husky Study Groups

In the past, some students have gained a lot from study groups. Should you be interested in forming one, you can go here for more information: https://nexus.uconn.edu/secure_per/studygroups/index.php

Academic Integrity

A fundamental tenet of all educational institutions is academic honesty; academic work depends upon respect for and acknowledgement of the research and ideas of others. Misrepresenting someone else's work as one's own is a serious offense in any academic setting and it will not be condoned.

Academic misconduct includes, but is not limited to, providing or receiving assistance in a manner not authorized by the instructor in the creation of work to be submitted for academic evaluation (e.g. papers, projects, and examinations); any attempt to influence improperly (e.g. bribery, threats) any member of the faculty, staff, or administration of the University in any matter pertaining to academics or research; presenting, as one's own, the ideas or words of another for academic evaluation; doing unauthorized academic work for which another person will receive credit or be evaluated; and presenting the same or substantially the same papers or projects in two or more courses without the explicit permission of the instructors involved.

A student who knowingly assists another student in committing an act of academic misconduct shall be equally accountable for the violation, and shall be subject to the sanctions and other remedies described in *The Student Code*.

Code of Conduct for Candidates

This course is designed for students seeking to obtain a credential from the Society of Actuaries (SOA) or the Casualty Actuarial Society (CAS). Actuarial Candidates, as defined by these organizations, must adhere to the Code of Conduct for Candidates (SOA) and Code of Professional Ethics for Candidates (CAS).

Evaluation of Course Experience:

Students will be given an opportunity to provide feedback on their course experience and instruction using the University's standard procedures, which are administered by the Office of Institutional Research and Effectiveness (OIRE).

The University of Connecticut is dedicated to supporting and enhancing teaching effectiveness and student learning using a variety of methods. The Student Evaluation of Teaching (SET) is just one tool used to help faculty enhance their teaching. The SET is used for both formative (self-improvement) and summative (evaluation) purposes.

Appendix: Tentative Class Schedule

Any changes to test dates will be communicated in class and on HuskyCT at least 1 week in advance of the test date.

MATH 2620 F23 Class Schedule (Tentative)

Week of	**Tuesday**	**Thursday**
August 28	Class Intro / CH 1	CH 1
September 4	CH 1	Ch 2
September 11	CH 2	CH 2
September 18	**Test 1 (CH 1-2)?**	**Test 1 (CH 1-2)?**
September 25	CH 3	CH 3
October 2	CH 3	CH 3
October 9	CH 4	CH 4
October 16	CH 4/Test 2 Review	**Test 2 (CH 3-4)**
October 23	CH 5	CH 5
October 30	CH 5	CH 5
November 6	CH 6	CH 6
November 13	CH 6	CH 6
November 20	Break	Break
November 27	**Test 3 (CH 5-6)?**	**Test 3 (CH 5-6)?**
December 4	CH 8	CH 8
December 11	**Final Exam (CH 1-6, 8)**	