- **Instructor**     Vladimir Pozdnyakov
  Email     `Vladimir.Pozdnyakov@uconn.edu`
  Office Hours     Tue, 8:30-9:30AM via HuskyCT Collaborate

- **Lectures**     Tue/Thu 11:00-12:15PM via HuskyCT Collaborate

- **Text**     Financial Mathematics
  A Practical Guide for Actuaries and other Business Professionals (2nd Ed.)
  *by Chris Ruckman and Joe Francis*

- **Syllabus**

| Week | Topic |
|------|-------|
| 1 | Introduction to Course, Chapter 1: Interest Rates and Factors<br>simple interest, compound interest, accumulation, discount |
| 2 | Chapter 2: Level Annuities<br>annuities-certain with level annual payments (and continuous payments) |
| 3 & 4 | Chapter 3: Varying Annuities<br>arithmetic and geometric annuities (and continuously variable annuities) |
| 5 & 6 | Chapter 4: Non-annual Interest Rates and Annuities<br>payments more (and less) frequent than annual |
| 7 & 9 | Chapter 5: Project Appraisal and Loans<br>discounted cash flow (net present value; internal rate of return), loan analysis |
| 8 | Review and Midterm Exam: Chapters 1, 2, 3, and 4, Date: Oct 15 |
| 10 & 11 | Chapter 6: Financial Instruments<br>stocks, bonds, mutual funds, derivatives |
| 11 & 12 | Chapter 8: Term Structure of Interest Rates<br>spot rates, forward rates |
| 13 & 14 | Chapter 7: Duration, Convexity, and Immunization. Final Exam Review<br>sensitivity of securities prices to changes in interest rates |

- **Final Exam**

  - The date and time of the final exam will be announced later.
  - 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 Office of Student Services and Advocacy to discuss the possibility of rescheduling this exam. Please note that vacations, previously purchased tickets or reservations, graduations, 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 Office of Student Services and Advocacy with any questions. Thank you in advance for your cooperation.

- **Grades**

  - Both midterm exam and final exam are online exams. The exams will be distributed via HuskyCT. You will be expected to submit your solution via HuskyCT within a two-hour window. More detailed instructions will be provided before each exam.
  - Your course grades are based on the following weights:
    * midterm exam – 40%
    * final exam – 60%
  - Final exam covers only the second half of the course
  - There will be no make-up exams

- **Calculator**

  - A Texas Instruments BA II Plus are BA II Plus Professional calculators are allowed to use during SOA Exams. However, I will not use them in class. If you are planning to take the SOA exams, you should get familiar with these calculators.
  - From time to time, I will use a programmable calculator in class to solve equations numerically. You may use a programmable calculator (such as the TI-83, 84, 89, etc.) on exams.

- **University Policies**

  Please get familiar with the university policies originate from the University Senate, the Office of Institution Equity, Community Standards, and the Office of the Provost:
  
  http://provost.uconn.edu/syllabi-references/

- **Course Objectives**

  This is an important foundation course in actuarial science and finance, with two principal goals for students:

  1. to master the fundamental concepts of financial mathematics. More specifically, the objective is to learn the following key terms and key procedures.

     **Key Terms**
     - Simple interest, compound interest, discount
     - Nominal and effective rates of interest and discount, force of interest
     - Equivalent interest measures
     - Present value, future value, current value
     - Annuity, perpetuity
     - Yield rate, internal rate of return, inflation
     - Time-weighted and dollar-weighted rates of return
     - Spot rates, forward rates
     - Duration, convexity, immunization
     - Yield curve, spot rate curve, term structure of interest rates
     - Bond, mortgage, stock, mutual fund, short sale
     - Financial derivatives, call and put options

     **Key Procedures**
     - Calculate equivalent interest rates
     - 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 the present value of an annuity or a perpetuity
     - Use a calculator to find the yield rate (IRR) for a given set of cash flows
     - Calculate a loan payment amount and a loan amortization schedule
     - Calculate the duration and convexity of a bond or of a series of cash flows
     - Calculate a spot rate curve, given a yield curve
     - Calculate forward rates, given a set of spot rates
     - Perform calculations involving financial derivatives

  2. the second goal (for actuarial students) is to begin preparation for SOA Exam FM (CAS Exam 2). However, this is not an "exam preparation" course. Math 5620 covers most, but not all, of the topics for Exam FM/2; Math 3615 (Financial Mathematics Problems) is the preparation course for Exam FM/2.

- **The syllabus is subject to change.** It is possible that we will switch from the distance learning modality to the online one.