

FIN415: Fixed Income Securities

Professor: Sankarshan Acharya¹, Ph.D.

Office hours by appointment during 4:45 to 6:00 p.m. Tues and Thurs

Office: 2412UH, 312-413 9204, e-mail: sacharya@uic.edu

I. Course Objective

This course will focus on (i) the principles and practices of valuation and trading of fixed income securities and their derivatives, (ii) measuring and enhancing financial prosperity through trading, and (iii) to analyze scenarios in which markets may be dysfunctional to render the valuation and trading strategies impotent. There will be an independent project on estimation of the term structure of interest rates based on bond data. The estimated term structure may also be used for other assignments on valuation, trading and duration.

II. Course Grade

The final course grade will be based on the following:

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| 1. Constructive class participation through email feedback, attendance and timely completion of assignments | 20% |
| 2. Exam-I (10/08/12, 11:00 p.m., Sa) | 20% |
| 3. Exam-II (11/20/12, 11:00 p.m., Sa) | 20% |
| 4. Project (12/01/12, 11:00 p.m., Sa) | 20% |
| 5. Exam-III (12/08/12, 11:00 p.m., Sa) | 20% |

Students can and should have unlimited consultation with friends on any assignment. But the execution of all assignments including the project and written submissions are required to be completely independent. Exact answers from multiple students may result in penalties for all involved at the discretion of the instructor. Exams are required to be completed independently. Exams will be available by 7:30 p.m. on the day before the exam due date and be required to be completed and submitted by the time stated above. Absence from exams will not be excused except for serious medical emergency with doctor's letter.

A part of the class participation grade can be prorated with the rest of your grade or according to attendance and constructive class participation at the discretion of the professor. The professor encourages everyone to ask questions within and outside classes until the material is clear. But discussion among students or indulgence in other unseemly means to destroy class time, while someone else asks questions or while the professor answers and delivers material, may be reported to university authorities after due warnings. Any student who engages in such destructive loss of class time can receive zero on class participation grade.

¹ *About the Professor: Visit <http://pro-prosperity.com/Sankarshan%20Acharya.html>

III. Course Requirements

1. Students' own class notes taken from materials presented and displayed by professor, and questions and answers from fellow students. Students that secure highest scores in exams have generally taken comprehensive notes with a thorough understanding of materials.
2. Rapt attention to instructor and fellow students.
3. Class attendance.
4. Relevant chapters and sections, as mentioned from time to time, from a background textbook: "**Fixed Income Securities, Tools for Today's Markets**" by Bruce Tuckman, John Wiley and Sons; problems and trading strategies from my "**Prosperity: Optimal Governance in Banking, Capital Markets, Global Trade, Exchange Rate,**" by Citizens Publishing. These books will serve as guides. All the materials in these books may not be fully covered and any material that is covered may not be presented in class in exactly the same format as in the book. My website www.pro-prosperity.com has a lot of educational material relevant to finance and latest events and policies that affect our prosperity. Though these are excellent guidebooks, experience shows that presuming to gain the necessary understanding in this course from reading books alone is not productive. This course will be built on my classroom presentations starting from the level of understanding and skills of students in this course.
5. Access to the Internet and a financial calculator like HP-12C or better.
6. Computer skills with facility to program in any package like Minitab, RATS, SAS, Excel, etc. No specific computer program will be prescribed. This is a course on finance, not computer programming. So, computer skills needed to execute the project and other assignments will be the sole responsibility of students.
7. Complete familiarity with basic financial calculations like the net present value, internal rate of return, and yield to maturity of bonds using some financial calculator. The course will review some of these materials on continuous and discrete times, as and when necessary, but it is absolutely mandatory that students possess a deep understanding of these basic financial calculations.
8. The course is very intensive and requires hard work.

IV. Course Description

- Current prices of future dollars and the concept of discount factors.
- Arbitrage-free fair prices of bond using replicating portfolios.
- The concept and practice of trading based on a comparison of market price with the fair price of a bond.
- Estimating term structures of discount factors, spot interest rates, and forward rates using real data; and applications of term structures.
- Estimation and application of duration and convexity of bonds.
- Estimation and application of key rate durations.
- Concepts on Prosperity, Measurement and Estimation
- Arbitrage-free pricing of interest rate contingent claims like puts and calls written on bonds using one-step binomial trees.
- Unusual Trading Strategies for Prosperity
- The art and practice of term-structure modeling using one-step models.
- Valuation of floaters, collars, and caps.
- Interest rate swaps.

- Interest rate futures and forwards.
- Asset backed securities markets.

V. Prerequisites for Success in the Course

FIN-310 (Investments) is a prerequisite for this course. The prerequisite for success in this course include the following:

- A thorough grounding in Econometrics or Business Statistics.
- A knack for solving problems involving intense quantitative reasoning.
- The ability to visualize how profits can be made in the real world.

It is necessary that students have a strong commitment to work diligently, to write class notes sincerely, to come prepared with a cumulative understanding of materials covered in all previous classes, and to initiate and participate in constructive class discussion. Anyone facing extenuating circumstances for missing a class is required to copy class notes from a fellow student and to complete assignments by the due dates. Assignments after due dates will not be accepted for credit, but students are required to complete all assignments sincerely even after the due dates since the exam materials include assignments. It is the responsibility of every student to take comprehensive class notes including questions and answers from fellow students. Examinations will be based on all material covered, which will generally be in the best class notes, and relevant chapters and sections of the textbook. In case some student points out that some examination material is not covered in class or in the relevant sections of the book, the professor will have the discretion to cite such materials noted by any other student and/or the relevant section of the book. It is thus mandatory that students remain attentive in class and take notes very accurately to avoid losing points in examinations. Someone not sure of own note taking skills may ally any other fellow students through mutual understanding.

VI. How to Obtain Best Grades in this Course

To receive the best grades, students need to focus on the following:

1. Complete familiarity with basic financial functions like (i) computation of present values of cash flows discounted with interest rates compounded continuously and at different other frequencies, and (ii) the internal rates of return. These skills must have been acquired in a basic finance course and/or while learning the functions through the handbook of a basic financial calculator like HP-12C. It is imperative that students review this prerequisite stuff thoroughly and carry a financial calculator, if not HP-12C, to every class. The professor will also help you thoroughly understand these basic financial functions through specific computations in the context of problems solved in this course. But, it is only your responsibility to master the prerequisite financial calculations and to not let them stand in your way to learn fixed income securities.
2. Learn all materials, and presume no topic as trivial. Doubts about some “little” topic can cause accumulated havoc.
3. Take comprehensive class notes including questions and answers from fellow students and the professor.
4. Do not gossip at anytime, especially, when others are asking questions and/or the professor is responding to such questions. Gossiping is a recipe for bad performance in this course. Besides, the professor reserves the right to evict gossiping students from classroom

- because it is a serious obstruction to learning. Students desperately needing to chat may leave the classroom at anytime.
5. The style of instruction for this course is to build up from the current understanding level of the class. So, the professor may begin discourse on a topic very familiar or easy to students. As a result of such discourse, many students feel overconfident and then become inattentive while the professor is imparting new material, vital for exams, projects and assignments. Rapt attention to and a comprehensive understanding of all covered materials are crucial for success in this course.
 6. Pay serious attention to questions and answers, because some questions may lead to new course topics and so the professor's answer may likely introduce new material that may catch inattentive students unawares.
 7. When the professor adopts a different route to clarify the same concept, some students tend to neglect the alternate route because they are "sure" of the concept! But, this can pose problems in solving questions on the same concept but with different given information.
 8. Come prepared to every class with a cumulative understanding of the material covered thus far in the course.
 9. Mechanical understanding of calculations for solving problems in this course is necessary, but not sufficient. A thorough understanding of concepts as well as ideas is paramount. This course induces you to think like a decision maker and so you need to fully assimilate and appreciate the thought process behind every solution. After each class and before coming to the next class, you need to ruminate over the ideas and the thought process driving the material covered. Remember that only you can make yourself think.
 10. The professor is here to help you achieve the best grade, but it is your answers to questions in tests, homework, and project that determine your grade. Any claim about an understanding of the material without a demonstration through written responses to questions will not translate into a good grade. A standard problem with grading is that it misses some geniuses sometime. But, this being the best method adopted by the universities, your grades will be exclusively based on a written demonstration of your skills. You need to write on your own at home/dorm to practice how to use the new language of fixed income securities. Proper communication is an enormously important in this field of finance, which accounts for 60-70% of all investment banking business in the real world. The professor will help you familiarize with the field jargons, but it is ultimately your responsibility to pick up the language of communication in fixed income securities. What matters in the real world is not just what you know, but how best you can express what you know.
 11. The professor's grade distribution for this course has varied from 10% to 50% A's, 50% B's, 0%-40% C's and 0-10% D's. There is no curving. Scores of 90% or more will generally translate to "A," 80%-89% to "B," 70%-79% to "C," and 60%-69% to "D." Lower grades than "D" are rare because most students who are not confident to secure at least 60% drop out. While the professor will make every effort to help a student get at least a D grade, there is no guarantee about it as there have been cases of failure in this course.