

MATHEMATICS OF FINANCE (MATH-UA.0250-001), FALL 2017

Lectures: Mon/Wed 9:30-10:45am, WWH 202

Professor Robert Kohn

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Fall 2017 office hours: Mon 2:30-3:30 and Wed 4-5

Recitations: Fri 12:30-1:45pm, WWH 201

TA: Mario Raul Franco Ortega, mario.franco@nyu.edu

Fall 2017 office hour: Tues 2-3, WWH 705

Updated 9/19/2017 – added info on recitation and TA, and permanently shifted my Monday office hour to 2:30-3:30

Prerequisites: Single-variable and multivariable calculus, and an introductory course in probability or statistics.

Description: Mathematical finance has two main themes: (a) portfolio optimization, and (b) the pricing and hedging of options. Topic (a) explains the benefits of diversification, and quantifies the tradeoff between risk and return. Topic (b) uses the absence of arbitrage to draw surprising conclusions about the prices of options, and about how to reduce exposure to market risk. In both areas, the main ideas can (and will) be explained using relatively elementary mathematics (mainly: calculus and discrete probability). No prior knowledge of finance or economics is assumed.

Textbook: *Mathematics for Finance: An Introduction to Financial Engineering*, by Marek Capinski and Tomasz Zastawniak, Springer-Verlag, 2nd edition, 2011. This has *not* been ordered by the NYU bookstore (I only learned I was teaching this class on Sept 1). Note: the second edition has a lot in common with the first, but it is different enough to matter.

Course requirements: There will be weekly homework assignments, two midterm exams, and a final exam. They will be weighted equally (1/4 HW, 1/4 each midterm, 1/4 final exam). In calculating your HW score for the semester, one week's HW (the lowest) will be excluded.

Some special dates: The midterms will be on Mon 10/2 and Mon 11/13. No class on Mon 10/9 (Fall Recess) and Wed 11/22 (Thanksgiving). We have an extra class on Tues 12/12 (Legislative Day). The last lecture is Wed 12/13 (the last recitation is Fri 12/15). According to the NYU Registrar's site, our Final Exam is Mon 12/18, 8-9:50am.

Note: There are *two* sections of Mathematics of Finance this fall (the other one is taught by Professor Avellaneda). We are using different textbooks, and therefore the order of topics, homework assignments, exams, etc will be different. However the two sections will be at roughly the same level, and will cover roughly the same material.

Some Policies

Preparing for class: You will be often be asked to read a section of the book in advance of class. Our class time is best used for discussing ideas, doing examples, etc. It is intended to *supplement* the book, not to replace it. Ideas and examples are important; thus, to do well in this course you are strongly advised to *come to every class*.

Recitations: The recitations are not lectures (they will not cover entirely new material). Rather, they provide an opportunity for practice, and for questions. Typically, the recitation instructor will ask you to consider questions related to the recent class material (perhaps similar to recent or current homework). Come to recitation prepared to think and talk as well as to listen.

Collaboration on homework: Collaboration is encouraged. However each student must write up his/her own solutions (this is an important part of the learning process). If you work closely with someone else, get help from a book, take a solution from the web, etc, please *identify your collaborators and/or sources*. Direct copying of another student's solutions is *not* permitted – both because it amounts to cheating, and because it is defeats the entire purpose of the homework (which is to gain practice and familiarity with new concepts and techniques). Similarly, it is forbidden to permit another student to copy your solutions.

Late HW: Each HW assignment will have a due date (typically by the beginning of a particular class or recitation). Late HW will not be accepted. Please turn in hard copy if possible; if this isn't possible, a single PDF sent to kohn@cims.nyu.edu is OK. (Separate jpg's of each page are *not* acceptable.)

Makeup exams: Makeup exams will be given only for legitimate reasons such as religious holidays, conflicts with university-sponsored activities (eg athletics), or documented illness. If the reason for requesting a makeup is known in advance, permission to take a makeup *must* be requested *before* the exam date. Requests based on personal convenience (eg flights home are cheaper before the final) will *not* be granted.

Academic integrity: Plagiarism and cheating will not be tolerated. NYU's College of Arts and Sciences has policies in this area, and they will be followed. See
<http://cas.nyu.edu/academic-integrity.html>