

University of Minnesota College of Science & Engineering  
FM 5031/2 Practitioner Sequence  
Module: Risk & Asset Allocation (6+6 weeks)

Instructor: John Dodson

*DRAFT* September 24, 2012

This course is part of the Masters in Financial Mathematics (MFM) program required practitioner sequence. The objective of this course is to provide students with a grounding in theoretical and applied statistics as it relates to investments, with an emphasis on risk measurement and decision techniques for portfolio design.

## Sessions

There will be weekly class sessions for seven weeks during Fall semester and six weeks during Spring semester.

Class sessions for fall term will be held Wednesdays in Physics (Tate) 210 from 5:30 PM to 8:50 PM with a break at 7:00 PM.

Your instructor lives out of state. For some sessions, the instructor will be hosting remotely via telephone (866-244-8528 conference 481152) and UM Connect (based on Adobe® Flash®) at

<https://umconnect.umn.edu/dodson>

The teaching assistant will be available during these sessions.

## Final

The fall final is scheduled for **Wednesday, December 19**. Please take into account the date of the final when making your holiday plans.

## Resources

### Instructor

The instructor will hold office hours on Sundays from 7:00 PM to 9:00 PM by UM Connect. You may make alternate arrangements by contacting the instructor. You may contact the instructor at

<mailto:jdodson@math.umn.edu>

## **Blog**

The class web log is

<http://blog.lib.umn.edu/dodso013/finmath/>

I encourage you to check this regularly for posts. You may want to subscribe to the site's RSS feed.

## **Web Site**

The class website is

<http://www.math.umn.edu/~dodso013/fm503/>

I will post slides a week in advance and update the journal a week in arrears.

## **Teaching Assistant**

Our teaching assistants for the fall term are Nick Kirchner (kirc0076) and Jingnan Zhang (zhan1441). For fall term Nick will hold office hours on Mondays from 7:00–9:00 PM and Saturdays from 1:00–3:00 PM in Vincent Hall 529. Jingnan will hold office hours Thursdays from 1:00–2:30 PM in the math lounge.

## **Software**

The course will make use of the MATLAB<sup>®</sup> system by The MathWorks Inc. A useful site for documentation and public libraries for MATLAB<sup>®</sup> is

<http://www.mathworks.com/matlabcentral/>

## **Texts**

The main text for the course is

M: *Risk and Asset Allocation*, by Attilio Meucci, published by Springer-Verlag, ISBN 978-3-540-22213-8 or 978-3-642-00964-8 (soft cover).

The author maintains a website for the text at

<http://www.symmys.com/attilio-meucci/book>

including an errata that I recommend you print out and a technical appendix that I recommend you download.

## **Recommended texts**

In addition to the required text, these may be useful supplements:

- *Probability and Statistics, 3<sup>rd</sup> ed.*, by Morris DeGroot and Mark Schervish
- *Monte Carlo Methods in Financial Engineering*, by Paul Glasserman
- *Quantitative Risk Management – Concepts, Techniques, Tools*, by Alexander McNeil, Rüdiger Frey, and Paul Embrechts

## Schedule

Please complete the scheduled reading before each class session.

### FM 5031/2 module

date	subject	reading
Wed 5 Sep	random variables	M 1.1–1.2
Wed 12 Sep	dependence	M 2.1–2.5
Wed 19 Sep	common characterizations	M 1.3, 2.6–2.7
Wed 26 Sep	estimators	M 4.1–4.4
Wed 3 Oct	heteroskedasticity	paper
Wed 10 Oct	real-world data	M 3.4, 4.5–4.6
Wed 19 Dec	exam	
Wed 23 Jan	prices as random variables	M 3.1–3.3
Wed 30 Jan	Bayesian estimation	M 7
Wed 6 Feb	investor objective & satisfaction	M 5
Wed 13 Feb	mean-variance optimization	M 6.3–6.5
Wed 20 Feb	Black-Litterman allocation	M 8.1–9.5
Wed 27 Feb	practical topics	M 6.1–6.2, 6.6
Wed 15 May	exam	

The semester exams will be held from 5:30 PM to 8:00 PM on December 19 and May 15.  
We may have a guest speaker for one of the sessions.

## Evaluation

Grading will be based on three evaluation sources each semester: regular weekly homework (25%), a larger assignment due one week after the last session (50%) and part of the final exam<sup>1</sup> (25%).

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<sup>1</sup>These may be multi-part exams with sections for different modules.

## Grading

All grading is  $A-F$  with  $\pm$  (except  $A+$  &  $F$ ), according to the University's definitions:

- $A \leftarrow 4$  Achievement that is outstanding relative to the level necessary to meet course requirements.
- $B \leftarrow 3$  Achievement that is significantly above the level necessary to meet course requirements.
- $C \leftarrow 2$  Achievement that meets the course requirements in every respect.
- $D \leftarrow 1$  Achievement that is worthy of credit even though it fails to meet fully the course requirements.
- $F \leftarrow 0$  Represents failure (or no credit) and signifies that the work was either (1) completed but at a level of achievement that is not worthy of credit, or (2) was not completed and there was no agreement between the instructor and the student that the student would be awarded an  $I$ .
- $I \leftarrow \emptyset$  The incomplete shall be assigned at the discretion of the instructor when, due to extraordinary circumstances, the student was prevented from completing the work of the course on time. The assignment of an  $I$  for the sequence requires a written agreement between the affected instructors, the program management, and the student specifying the time and manner in which the student will complete the course requirements.

Grades for FM 5031 modules are averaged at weights according to the number of weeks for each section. This module's weight is  $\frac{6}{15}$  for FM 5031 and  $\frac{6}{15}$  for FM 5032 aggregated according to the scheme at

<http://math.umn.edu/finmath/courses/grading.shtml>

## Academic integrity

Academic integrity is essential to a positive teaching and learning environment. All students enrolled in University courses are expected to complete coursework responsibilities with fairness and honesty. Failure to do so by seeking unfair advantage over others or misrepresenting someone else's work as your own, can result in disciplinary action. The University Student Conduct Code defines scholastic dishonesty as follows:

*Scholastic dishonesty* means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis.

Within this course, a student responsible for scholastic dishonesty can be assigned a penalty up to and including an  $F$  or  $N$  for the course. If you have any questions regarding the expectations for a specific assignment or exam, ask.

## **Instructor Policies**

### **Extra credit**

The instructor will not accept any work for extra credit.

## **University Policies**

Inquiries regarding any changes of grade should be directed to the instructor of the course; you may wish to contact the Student Conflict Resolution Center (SCRC) in 211 Eddy Hall (624-7272) for assistance.

Students with disabilities that affect their ability to participate fully in class or to meet all course requirements are encouraged to bring this to the attention of the instructor so that appropriate accommodations can be arranged. Further information is available from Disabilities Services (230 McNamara).

University policy prohibits sexual harassment as defined in the December 1998 policy statement, available at the Office of Equal Opportunity and Affirmative Action. Questions or concerns about sexual harassment should be directed to this office, located in 419 Morrill Hall.

The Board of Regent's academic policies are available at

<http://www1.umn.edu/regents/polindex.html>

The Student Conflict Resolution Center website is

<http://www.sos.umn.edu/>

The Office for Student Conduct and Academic Integrity website for students is

<http://www1.umn.edu/oscai/integrity/student/index.html>