

University of Minnesota College of Science & Engineering  
FM 5031/2 Practitioner Sequence  
Module: Risk & Asset Allocation (7+6 weeks)

Instructor: John Dodson

*DRAFT* February 11, 2011

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 in Mechanical Engineering 18 from 5:30 PM to 8:50 PM with a break at 7:00 PM. Spring term sessions will be held in Physics (Tate) 131.

Your instructor lives out of state. Most sessions will be on Wednesdays with the instructor hosting remotely via telephone (866-244-8528 conference 4811528) and UM Connect (based on Adobe® Flash®) at

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

The teaching assistant will be available during these sessions.

## **Sunday sessions**

Two fall sessions will be held on Sundays for the fall term, September 12 and October 3, with the instructor present. The instructor will also be hosting a final review session on December 12. For spring term, the Sunday sessions will be January 23 and February 13 (office hours) and the exam review is scheduled for May 1.

## **Final**

The fall final is scheduled for Wednesday, December 22. 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 unless he is in Minneapolis, in which case office hours will be held on the preceding Wednesday. 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; alternatively, please contact the instructor if you wish to have an e-mail address added to the site's notification list.

### **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 assistant for the fall term is Yun Liu (liu297). Our teaching assistant for the spring term is Nick Kirchner (kirc0076). Nick will be holding office hours from 3:30 to 5:30 PM on Mondays in Vincent Hall 456.

### **MATLAB**

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 3-540-22213-8 or 978-3-642-00964-8 (soft cover). There is also a hardcover printing.

The author maintains a website for this text at

<http://www.symmys.com/>

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 8 Sep	introduction	
Sun 12 Sep	probability basics	M 1.1–2
Wed 15 Sep	parametric distributions	M 1.3
Wed 22 Sep	dependence	M 2
Sun 3 Oct	modeling the markets	M 3
Wed 6 Oct	estimators	M 4.1–4
Wed 13 Oct	conditional heteroskedasticity	paper
Wed 20 Oct	working with real-world data	M 4.5–6
Wed 22 Dec	exam	
Sun 23 Jan	objectives & preferences	M 5–6.2
Wed 26 Jan	mean-variance	M 6.3–7
Wed 2 Feb	bayesian estimation	M 7
Wed 9 Feb	evaluating allocations	M 8
Wed 16 Feb	Black-Litterman allocation	M 9.1–2
Wed 23 Feb	robust allocation	M 9.3–5
Wed 11 May	exam	

The semester exams will be held from 5:30 PM to 8:00 PM on December 22 and May 11.  
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%).

## 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  $\frac{7}{15}$  for FM 5031 and  $\frac{6}{15}$  for FM 5032.

## Academic dishonesty

Academic dishonesty in any portion of the academic work, including representing the work of others without proper citation, shall be grounds for awarding a grade of  $F$ .

## Instructor Policies

### Extra credit

The instructor will not accept any work for extra credit.

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

## 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 University Senate's academic policies are available at

<http://www1.umn.edu/usenate/usen/policies.html>

The University's Student Conflict Resolution Center website is

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