

University of Minnesota Institute of Technology

FM 5031 Practitioner Sequence (4 cr.)

Module: Portfolio Optimization (7 weeks)

Instructor: John A. Dodson*

DRAFT September 9, 2008

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 finance, 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 (3 September to 15 October).

We will hold class sessions in the Active Learning Classroom EE/CS 2-260 from 5:30 PM to 8:50 PM on Wednesdays, with a break at 7:00 PM to accommodate other instructors' office hours.

Resources

The instructor will hold office hours on Sundays from 7:00 PM to 9:00 PM in Vincent Hall 262¹. You may make alternate arrangements by contacting the instructor.

You may contact the instructor by e-mailing to

`jdodson@math.umn.edu`

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.

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. The course will make use of the MATLAB[®] system by The MathWorks Inc. A useful site for documentation and public libraries for MATLAB[®] is

`http://www.mathworks.com/matlabcentral/`

*RiverSource Investments LLC, an Ameriprise Financial company

¹You will need to arrange access to the building on Sunday evenings.

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

The author maintains a website for this text at

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

including an errata that I recommend you print out.

Recommended texts

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

- *Probability and Statistics, 3rd ed.*, by Morris DeGroot and Mark Schervish
- *Introduction to Linear Optimization*, by Dimitris Bertsimas and John Tsitsiklis

Schedule

Please complete the scheduled reading before each class session.

FM 5031 module

date	subject	reading
3 Sep	random variables	M 1.1–3
10 Sep	dependence	M 2.1–6
17 Sep	modeling markets	M 3.1–3
24 Sep	estimators	M 4.1–3; 7.1–2,4
1 Oct	evaluating allocations	M 5.1–6
8 Oct	classical optimization	M 6.1–5
15 Oct	bayesian optimization	M 9.1–3

The first assignment will be distributed on 17 September and collected on 24 September. The second assignment will be distributed on 15 October and collected on 22 October at the beginning of the next module.

The last day to cancel the FM 5031 sequence, without permission from the Mathematics office, is 15 September.

Grading

Grading will be based on two take-home assignments equally weighted. You will be asked to sign a statement indicating that the work you submit is yours and yours alone for these evaluations.

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 $\frac{7}{15}$.

N.B.: Academic dishonesty in any portion of the academic work shall be grounds for awarding a grade of F .

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 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://www1.umn.edu/sos/index.html>