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

Instructor: John Dodson

DRAFT January 20, 2016

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 applied probability theory and statistics as it relates to financial risk management.

Sessions

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

Class sessions for fall term will be held Wednesdays in Vincent Hall 016 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 the University's Cisco WebEx™

`https://umn.webex.com`

There is a link to the classroom from the website.

The teaching assistant will be available during these sessions.

Resources

Instructor

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

`mailto:jdodson@math.umn.edu`

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 and spring terms is Mark Jadin (jadin006).

For the fall term, he will hold office hours Mondays from 6:00 PM to 8:00 PM in the lounge on the fifth floor of Vincent Hall.

For the spring term, he will hold office hours Mondays from 7:00 PM to 9:00 PM in the lounge on the fifth floor of Vincent Hall.

Texts

The main text for the course is

QRM: *Quantitative Risk Management, Concepts, Techniques, and Tools (Revised Edition)*, by Alexander McNeil, Rüdieger Frey, and Paul Embrechts; published by Princeton University Press, ISBN 978-0-691-16627-8.

`http://press.princeton.edu/titles/10496.html`

Recommended texts

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

- *Probability and Statistics, 4th ed.*, by Morris DeGroot and Mark Schervish
- *Monte Carlo Methods in Financial Engineering*, by Paul Glasserman

Schedule

Please complete the scheduled reading before each class session.

FM 5031/2 module

date	subject	reading
Wed 9 Sep	basic concepts in risk management	QRM I.2
Wed 16 Sep	empirical properties of financial data	QRM I.3
Wed 23 Sep	probability distributions	QRM A.2
Wed 30 Sep	likelihood inference	QRM A.3
Wed 7 Oct	financial time series	QRM II.4
Wed 14 Oct	extreme value theory	QRM II.5
Wed 20 Jan	multivariate models	QRM II.6
Wed 27 Jan	copulas and dependence	QRM II.7
Wed 3 Feb	aggregate risk	QRM II.8
Wed 10 Feb	market risk	QRM III.9
Wed 17 Feb	credit risk	QRM III.10
Wed 24 Feb	operational risk	QRM III.13

Evaluation

Grading will be based on three evaluation sources each semester: weekly in-class short quizzes (25%), regular weekly homework (25%), and a larger assignment due one week after the last session (50%).

The lowest-scoring quiz each semester will not count towards the quiz total.

Grading

Module grading is A–D with $\pm$ (except $A+$), 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 FM 5032 aggregated according to the scheme described 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 elses 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.

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://regents.umn.edu/policies/index`

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://www.oscai.umn.edu/integrity/student/index.html`

The University of Minnesota is committed to providing all students equal access to learning opportunities. Disability Services (DS) is the campus office that works with students who have disabilities to provide and/or arrange reasonable accommodations.

- Students who have, or think they may have, a disability (e.g. mental health, attentional, learning, vision, hearing, physical or systemic), are invited to contact DS to arrange a confidential discussion at 612- 626-1333 (V/TTY) or `mailto:ds@umn.edu`.
- Students registered with DS, who have a letter requesting accommodations, are encouraged to contact the instructor early in the semester to discuss accommodations outlined in their letter.

Additional information is available at the DS website

`https://diversity.umn.edu/disability`