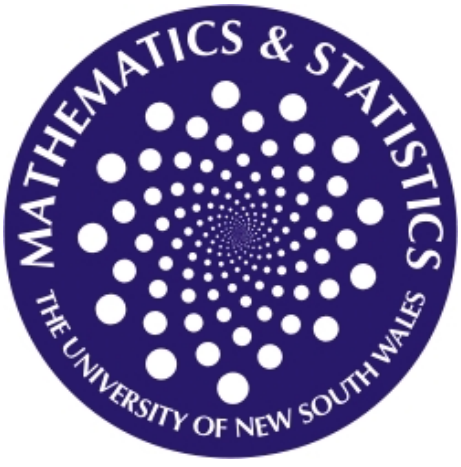
FACULTY OF SCIENCE
SCHOOL OF MATHEMATICS AND STATISTICS

MATH2881

QUANTITATIVE RISK

Session 2, 2009



MATH2881 – Course Outline

Information about the course

Lecturer: Mr Gregory Monahan, formerly Head of Risk Practice at SAS.

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Further Internal UNSW contact :

Professor James Franklin,
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The School is grateful to SAS and to the Commonwealth Bank Of Australia for sponsorship of the course.

Credit

This course counts for 6 Units of Credit (6 UOC). It is a core course for the new Quantitative Risk major in Advanced Science but is available to other students. For further information see :
http://www.maths.unsw.edu.au/news/2006/quantitativerisk.html.

Lecture: There will be one two-hour lecture per week:

Weeks 1-12 Thursdays 4-6 pm in MechEng303 .

Tutorial: There will be one one-hour tutorial per week:

Weeks 2-13 Thursdays 3-4 pm.

This tutorial will be held in CE G8 for all Weeks 1-12, except for Week 3 (Thursday August 6) and Week 7 (Thursday September 3) when it will be held in the laboratory in RC G12C.

WebCT: Further information, lecture notes, tutorial questions and other material will be provided via WebCT.

Prerequisites

The prerequisite for this course is any one of the following courses:
• MATH1231

- MATH1241
- MATH1251

Rationale of the Course

With the increasing sophistication of risk analysis in banking and finance, driven especially by the BASEL II compliance regime, there is a strong demand for graduates with training in quantitative risk management. Such graduates are coming to form a profession of their own, related to bank risk as actuaries are related to insurance risk. Skill in statistics is the core of the new quantitative approach to risk.

Course schedule

It is intended that the following topics will be covered in the given order. Any variation from this will be indicated by the lecturer.

- Overview of risk measurement and mitigation in banks.

- Types of risk: market, credit, operational and their characteristics.

- The banking environment, regulation, and capital reserving; risk at the macro level.

- Economic capital and RAROC.

- The VaR formalism.

- Issues on sensitivity to data: heavy tails, heteroskedasticity, mean reversion, robustustness of correlation estimates.

- Measurement of market risk, credit risk and operational risk.

- Combination of risk and attribution.

- More on Basel II requirements.

- Other concepts: Concentration analysis, Correlation, Model risk.

Student Learning Outcomes

At the end of this course students will have a thorough understanding of
• the risks faced by financial services organisations;

• the mathematical techniques applied in the measurement of the risks faced by financial institutions;

• the practical application of risk management methodologies in financial institutions.

Assessment

Assessment in this course will consist of:
• **Tutorial Questions : Weighting 30%**
Answers to short questions are to be handed in at the end of each tutorial. Tutorials will not necessarily be of equal value.
• **Two assignments: Total weighting 40%.**
Assignment 1 (20%) is due August 27, 2009
Assignment 2 (20%) is due October 8, 2009
• **Examination : Weighting 30%**
Examination period from November 2, 2009.

Tutorial Exercises

A set of tutorial questions for each tutorial will be available on the webCT. You will be required to download the question sheets *before* the tutorial, answer the questions *before* the tutorial, and bring your answers to the tutorial, where you will submit them for marking.

Assignments

In each assignment you will be required to write an essay to illustrate your understanding of the issues involved in a given topic or situation. The assignment question will give points which are to be included in your discussion.

Assignments must be YOUR OWN WORK, or severe penalties will be incurred.

You should consult the University web page on plagiarism

`www.lc.unsw.edu.au/plagiarism`

Final examination

The final examination will be held in the examination period at the end of the session. This examination will be of **2 hours duration** and will test the entire course. The questions will give students the opportunity to show how successfully they have achieved the learning outcomes.

Recommended Reading

C. Marrison. *The Fundamentals of Risk Management.*

School Rules and Regulations

Fuller details of the general rules regarding attendance, release of marks, special consideration etc are available via the School of Mathematics and Statistics Web page at `http://www.maths.unsw.edu.au/students/current/policies/studentpolicy.html`.

Plagiarism and academic honesty

Plagiarism is the presentation of the thoughts or work of another as one's own. Issues you must be aware of regarding plagiarism and the university's policies on academic honesty and plagiarism can be found at `http://www.lc.unsw.edu.au/plagiarism` and `http://www.lc.unsw.edu.au/plagiarism/plagiarism_STUDENTBOOK.pdf`.