

UNIVERSITY OF WOLLONGONG
School of Mathematics and Applied Statistics

STAT304 - Applied Probability and Financial Risk

Information for Students, Autumn Session 2006
(Wollongong Campus)

Subject Co-Ordinator:

A/Prof. Yan-Xia Lin
Room 15.144 Phone: (02) 4221 4336
e-mail: yanxia@uow.edu.au
*Consultation** Tue. 9.00am to 11:00am, Wed. 1:00pm-3:00pm

* Subject to change – Details on Office door.

Subject Pre-requisites: Either (MATH188 and [STAT131 or STAT231]) or MATH283

Subject Co-requisites: None.

This information sheet must be read in conjunction with the general information on educational issues and student matters provided in the document “Policies and Services of the University, Faculty and School” published by the School of Mathematics and Applied Statistics. A copy may be obtained from the subject coordinator or at <http://www.math.uow.edu.au/current/generic.html>.

Lecturers:

Dr Yan-Xia Lin Room 15.144 Phone:(02) 4221 4336
e-mail: lin_yan-xia@uow.edu.au
Dr Phil Kocic Room (TBA)Phone: (02) 6272 2063
e-mail: Phil.Kocic@abare.gov.au

Both lecturers will be available for consultations during scheduled consulting hours (at least four hours per week). Details of these hours can be found on our office doors.

Lectures and Tutorials: There are 2 lectures and one tutorial each week. However the tutorials will be integrated with lectures

Lectures:

Tuesday	3.30pm	4.30pm	1.G03
Wednesday	9:30am	11:30am	1.G03

The lecture/tutorial dates for Dr Kocic are 28th February, 1st March, 14th-15th March, 9th-10th May, 24th-25th May.

References:

Sheldon M. Ross, *Probability Model*, eighth edition, Academic Press, Sydney, 2003.
Winston, W.L. *Operations Research: Applications and Algorithms*, 3rd edition, Duxbury, 1994.
Hillier, F.S. & Lieberman, G.J. *Introduction to Stochastic Models in Operations Research*, 5th edition, McGraw-Hill, 1990.
Taha H. *Operations Research: An Introduction*, 6th edition, Prentice Hall, 1997.

You are not required to purchase reference books. Several copies of all these books are available in the Library. These readings are recommended only and are not intended to be an exhaustive list. You are encouraged to use the Library catalogue and databases to locate additional readings with similar titles and contents.

Subject Objectives:

This subject develops the stochastic models required for decision making under uncertainty in finance, economics and actuarial statistics. Stochastic models include processes

in both discrete time (random walk, Markov chains) and continuous time (birth and death processes, Gaussian processes). The applications focus on the measurement, management and control of risk and its consequences. Particular topics include gambler's ruin, log-normal price models, Value at Risk (VaR) measures and Markowitz portfolio selection.

Subject Outline:

This subject will be taught by two lecturers, Dr Phil Kocic and Dr Yan-Xia Lin.

The following topics will be covered by Dr Philip Kocic. Financial risk management, Financial instruments basics, Value-at-risk, Historical simulation, The delta-gamma-normal method

Credit risk

The following topics will be covered by Dr Yan-Xia Lin.

Review of Probability Theory

Markov Chains

Introduction to stochastic processes, Markov property, transition probability matrix, Chapman-Kolmogorov equations, classification of states, first passage times, recurrence times, stationary distribution, absorption probabilities.

Queueing Theory

Poisson process, exponential distribution, continuous time transition probability matrix, transition intensity, birth-and-death process, stationary distribution. Basic structure of queueing models, queueing models based on the birth-and-death process, waiting times, finite queues, machine repair problem.

Introduction on Gaussian processes

Assessment *:

Assignments (Applied Probability)	15%
Assignments (Risk Management)	15%
Final examination (3 Hours and 15 mins)	70%

*Attendance at tutorial classes and lectures may be taken into account.

Scaling of marks is **not** a standard procedure in this subject.

There will be 2 assignments (7.5% each) in Risk Management and 6 or 7 weekly assignments (2.5% or 2.2% each) in Applied Probability.

There is no requirement that students pass any individual component of the assessment in order to receive a pass in the subject, nor is there a minimum attendance component. However, you should note that your performance and attendance during the term will be taken into consideration when deciding on an application for a supplementary exam. (See Extenuating Circumstances below.)

Cover sheets for assignments, and receipts:

All written assignments must have on the front page the name and student number of the student, the subject number, and an appropriate description of the piece of assessment (e.g. "Assignment 2"). Students who require a receipt upon submission of their assignment must obtain and complete the appropriate receipt form from the Secretary of the School and fasten it to their assignment.

Consultation

If you are having difficulty with STAT920, you are encouraged to seek advice from your lecturers or the subject coordinator (most tutors are casual staff and therefore are not available for consultation). For administrative matters, you should see the subject coordinator.

If you cannot come at the listed consultation times, contact the subject coordinator to arrange an appointment at a mutually convenient time.

Finally . . .

If you have any questions about the subject, or are experiencing difficulties which are affecting your performance in the subject, you should see one of us as soon as possible.

Policies and Services of the University, Faculty and School can be found from

<http://www.math.uow.au/current/generic.html>

Yan-Xia Lin