

General Information

MATH 277 is a 200-level mathematical statistics course. Its aim is to introduce basic concepts and techniques of probability and statistics, together with an explanation of the logical principles and mathematical tools on which they are based.

MATH 277 leads on directly to 300-level courses in statistics, probability and operations research, and provides an excellent foundation for the stochastic component of courses drawn from many diverse disciplines including computer science, econometrics, finance, management science, physics among others. MATH 277 is a 15 point, first trimester course.

Prerequisites

- MATH 142 (Calculus 1B) and MATH 151 (Algebra).

or a comparable background in mathematics approved by the course coordinator.

Course Objectives

On completion of MATH 277, students should:

- understand and be able to apply the basic concepts of probability theory;
- recognise, understand and be able to use several discrete and continuous random variables;
- understand mathematical expectation, the use of moment generating functions, and statistical independence;
- be familiar with several limiting probabilistic results, including the central limit theorem;
- be able to describe desirable properties of estimators and methods of obtaining estimates;
- understand and routinely use interval estimates, hypothesis tests, goodness-of-fit tests and some common applications of the general linear model.

Course Web Pages

You will find notices, tutorials, assignments and useful information on the course web pages at http://msor.victoria.ac.nz/Courses/MATH277_2013T1/WebHome

Lecturers

(Course Coordinator)

Dr Yuichi Hirose Room: CO529 ext: 6421 Yuichi.Hirose@vuw.ac.nz

Dr Petros Hadjicostas Room: CO425 ext: 6734 petros.hadjicostas@vuw.ac.nz

Marker

TBA

Lecture, Tutorial

Lectures Mon, Tue, Thu, Fri 11:00–11:50 am Murphy LT102 (*this includes tutorial time*)

Summary lecture notes will be handed out in lectures, but will *not* be available via the internet.

One fourth of the scheduled time each week will be used for *tutorial material*. However, this may be at different times each week, and may be broken up into smaller periods of time. Note the tutorial material is an important part of the course, in which ideas may be introduced and/or discussed in detail.

Assignments and Assignment Hand-in Box

Assignments will be set during the course, assessing the course objectives sequentially. Copies will be given out in lectures, and also on the web page. You are encouraged to discuss assignments with other students, but submitted work must be your own. Bonus point questions may be assigned from time to time that count directly towards the final assessment.

Assignments are to be handed in to the MATH 277 **hand-in box** (Cotton level 3) by the due date and time. Others will be considered late and will not be marked (the due date and time will be announced when the assignments are given). Feedback and marked work will be distributed at lectures, or will be available for collection (at certain times, to be announced) from the School Office (Cotton 358), on production of valid Student ID.

Computing

Most assignments will involve using the statistical software **R** in the Statistical Computing Laboratory, Cotton CO 535 (or on your own computer if you download **R**, which is free). **R** will also be used to illustrate points made in lectures and tutorial exercises. One of the School's programmers, Ray Brownrigg (in CO 538), is available to help students who are having problems with **R** or with other computing-related problems.

Workload

This course is regarded as 1/4 of a full-time load. Plan to spend about 10-12 hours per week on it, including lectures and tutorials. The other hours are for computing, doing assignments, doing extra problems, reading extra material and studying the lecture notes.

Test

Date : 19 April 2013 at 11:00-11:50am, Murphy LT102. It will be a closed book, 50 minutes test. The material covered will be announced in the lectures.

Assessment

The final mark for the course is made up as follows:

- 10% from assignments
- 10% from the test
- 80% from the final 3-hour examination.

All students should be available during the examination period: 10 June – 3 July 2013.

Mandatory Course Requirements

There are no mandatory course requirements. However, missing assignments or the test (without approved reasons) means a mark of zero is awarded, limiting your possible final grade, or your chance of an aegrotat pass if you are ill during exams.

Course Materials

You should have a scientific calculator, at least capable of taking logs and doing basic mathematical calculations. You may bring the calculator to the test and the final examination.

Recommended Reading

The QA273 Section of the main library contains many relevant books. Books which past students have found particularly useful are

- *Probability and Statistical Inference* by Hogg, R. V. and Tanis, E. A., (7th edition, Prentice-Hall). (On 3-day loan and closed reserve in the library.)
- *Mathematical Statistics with Applications* by Dennis Wackerly, William Mendenhall, and Richard L. Scheaffer, (7th edition, Duxbury Press). (On 3-day loan in the library.)

Topics

There are 30 lectures (12 weeks).

Weeks 1-6 Petros Hadjicostas	Probability, random variables, cumulative distribution functions, probability density functions. Discrete and continuous random variables. Expectation, variance, moment generating functions. Joint distributions, independence, covariance, correlation. Sampling distributions, law of large numbers, central limit theorem.
Weeks 7-12 : Yuichi Hirose	Confidence intervals and hypothesis testing. Analysis of variance. Linear regression. Estimation: methods of estimation, properties of estimators, topics in point estimation.

INFORMATION ABOUT THE SCHOOL

The School of Mathematics, Statistics and Operations Research (MSOR) is located in the Cotton Building on the Kelburn Campus.

- The School Office is in CO 358, on the 3rd floor of the Cotton Building. The office is open from 8.30am-5.00pm
- The School website is <http://msor.victoria.ac.nz>
- Hand in boxes for assignments are on level 3 of the Cotton Building
- Assignments can only be collected from the office at certain times, listed on the Marked assignments page: <http://msor.victoria.ac.nz/Main/MarkedAssignments>
- There is a noticeboard opposite the School Office where students seeking and offering private tuition in mathematics and statistics can put requests and advertisements.

STUDENT ADVISORS (School of Mathematics, Statistics & Operations Research)

To Disabled Students

A/Prof Megan Clark Room: CO 541 ph: 463 6738 Megan.Clark@vuw.ac.nz

To International Students

Dr Nokuthaba Sibanda Room: CO 532 ph: 463 6779 Nokuthaba.Sibanda@vuw.ac.nz

To Maori & Pacific Nation Students

A/Prof Megan Clark Room: CO 541 ph: 463 6738 Megan.Clark@vuw.ac.nz

Prof Geoff Whittle Room: CO 320 ph: 463 5650 Geoff.Whittle@vuw.ac.nz

To Women Students

A/Prof Megan Clark Room: CO 541 ph: 463 6738 Megan.Clark@vuw.ac.nz

Ginny Whatarau Room: CO 357 ph: 463 5666 Ginny.Whatarau@vuw.ac.nz

ACADEMIC INTEGRITY AND PLAGIARISM

Academic integrity means that university staff and students, in their teaching and learning are expected to treat others honestly, fairly and with respect at all times. It is not acceptable to mistreat academic, intellectual or creative work that has been done by other people by representing it as your own original work. Academic integrity is important because it is the core value on which the University's learning, teaching and research activities are based. Victoria University's reputation for academic integrity adds value to your qualification. The University defines plagiarism as presenting someone else's work as if it were your own, whether you mean to or not. 'Someone else's work' means anything that is not your own idea. Even if it is presented in your own style, you must acknowledge your sources fully and appropriately. This includes:

- Material from books, journals or any other printed source
- The work of other students or staff
- Information from the internet
- Software programs and other electronic material
- Designs and ideas

- The organisation or structuring of any such material

Find out more about plagiarism, how to avoid it and penalties, on the University's website:
<http://www.victoria.ac.nz/home/study/plagiarism>

Where to Find More Detailed Information

Find key dates, explanations of grades and other useful information at
www.victoria.ac.nz/home/study/

Find out about academic progress and restricted enrolment at
www.victoria.ac.nz/home/study/academic-progress.aspx

The University's statutes and policies are available at
www.victoria.ac.nz/home/about/policy/
except qualification statutes, which are available via the Calendar webpage at
www.victoria.ac.nz/home/study/calendar.aspx (see Section C).

Further information about the University's academic processes can be found on the website of the Assistant Vice-Chancellor (Academic) at
www.victoria.ac.nz/home/about.victoria/avcacademic/