STAT371 Statistical Theory

Aims

This unit introduces fundamental principles justifying statistical methodology. The principles broaden horizons and open a road to novel statistical applications. The unit includes an introduction to powerful asymptotic methods of statistics and to optimality principles.

Use of Scientific Notebook, a revolutionary software package for mathematical computation and reporting, makes solving statistical problems and presenting results easy and exciting.
STAT371 Statistical Theory

Assessment

Three assignments, 15% each,
Final examination, 55%.
STAT371 Statistical Theory

Assignments

There will be three Assignments.
STAT371  **Statistical Theory**

**Contact Information**

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STAT371 Statistical Theory

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Scientific Notebook.
News and Changes
Class Bulletin Board, joint with STAT810
Postgraduate Units Bulletin Board
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MACQUARIE UNIVERSITY
STAT371 D1 - 2004: Modern Statistical Concepts
STAT810 D1 - 2004: Statistical Theory
Course Information for Students
February 26, 2004

Classes:
Lectures:
Weeks 1 - 6: 1st March - 8th April 2004
Weeks 8 - 13: 3rd May - 11th June 2004
Mondays 2-5 p.m. in E6A 133.

Lecturers:
A/Prof. Andrzej S. Kozek, office: C5C476, tel. (02) 9850 8556 and
Ruth Penman, office C5C462, tel. (02) 9850 7838

Office hours:
- Monday 5 - 6 pm, Tuesday 5 - 6 pm,

Email:
- akozek@efs.mq.edu.au

Home pages:
WWW Stat371:
WWW Stat810:

Lecture notes.
Lecture notes, new and spare handouts, assignment problems, and their
solutions (after the due date) will be available from the Economics
Resource and Information Center (ERIC), C5C 244. Standard lecture notes and assignments will be also available from our WebCT home page. Make sure you got your WebCT password at the enrollment. If you have problems with access to the WebCT please contact the Library Information desk.

**News and changes.**

All changes will be displayed on the course WWW home page in file *News and Changes.*

Students are expected to attend all classes and return all assignments.

**Software:**

Scientific Notebook™ Release 3.5 is available in LAB C5C213 and C5C215


Local distributors:

  
  Email: info@hearne.com.au
  
  Mail: Level 6
  
  552 Lonsdale Street
  
  Melbourne 3000 Australia
  
  Phone (03) 9602 5088

- **MathStat Software.**
  
  
  PO Box 786
  
  Mulgrave MDC 3170
  
  Victoria AUSTRALIA Phone 61 3 9562 2766
  
  Fax: 61 3 9561 5524
  
  Email: info@mathstat.com.au

**Textbook:**

- **Mathematical Statistics with Applications, Sixth Edition**
  
  
  Duxbury Press, An International Thomson Publishing Company

This will usually be used not as a precise definition of course material, but rather as a reference point to cover matters which are not directly dealt with in lectures. It should clearly be understood that additional material will be included in lectures, assignments, etc.

Reading books:
- SERFLING, R.J. Approximation theorems of mathematical statistics (QA276.S45)
- FERGUSON, T.S. Mathematical statistics: a decision theoretic approach, (QA276.F45)
- FERGUSON, T.S. A course in large sample theory (QA276.6.F47)
- ZACKS, S. The theory of statistical inference. (QA276.Z26)
- LARSON, H. Introduction to probability theory and statistical inference (QA273.L352)
- LEHMANN, E.L. Testing statistical hypotheses (QA277.L425)
- LINDGREN, B.W. Statistical theory (QA276.L546)
- McCabe, B. and Tremayne, A. Elements of Modern asymptotic theory with statistical applications (QA277.M376)

Nonparametric Statistics:
- BRADLEY, J.V. Distribution free statistical tests (QA278.8.B7)
- CONOVER, W.J. Practical nonparametric statistics (QA278.8.C65)
- LEHMANN, E.L. Nonparametrics: statistical methods based on ranks (QA278.8.L43)

Assessment:
- 3 assignments 20% each, due on March 29th, on May 3rd and on May 31st, respectively
- End of Year Examination 55% (3 hours)
A student must have satisfactory performance in both the final examination and coursework material to pass the course. The final grade depends on overall interpretation of the data rather than strict numerical accumulation.

Course Rules:

- **There will be three assignments ( A1, A2, A3 ) due in class.**
- Failure to submit assignments will result in automatic exclusion from the unit in accordance with Bachelor Degree Regulation 10(1).
- Your attention is drawn to University's policies on collusion and collaboration.
- Students may and should benefit from discussing assignment work with other students. However, the actual work submitted must be a student's personal effort, and copying or plagiarism will result in disciplinary action. Disciplinary proceedings will be taken against offenders without any further warning being given.

Lectures:

Week 1:
Introduction to Probability and Statistics. Discrete random variables and their probability distributions.

Week 2:
Continuous random variables and their probability distributions.

Week 3:
Multivariate probability distributions. Functions of random variables.

Weeks 4 - 6:
Strong Law of Large Numbers, Central Limiting Theorem and the Fundamental Theorem of Statistics.

**Assignment 1 due on 29th March**

Week 7:
ANZAC Day. Public Holiday.

Week 8:

Weeks 9 - 10:
Estimation and properties of estimators.
Hypotheses testing and properties of tests.
Assignment 2 due on 3rd May

Week 11:
Hypotheses testing and properties of tests (cont.).

Week 12 - 13:
Linear Models and properties of the Least Squares Estimators.

Assignment 3 due on 31st May

Lecture notes are delivered by mail to distance students. On campus they can be photo-copied in ERIC, C5C 244, or downloaded from our Bulletin Board (2MB pdf file, Acrobat Reader needed. Read News and Changes for detailed information on how to download the file and Acrobat Reader.).
2004 D1: News and Changes.

26th February 2004.

Welcome to Stat371 and Stat810, Modern Statistical Concepts and Statistical Theory. On this Web page we shall post current announcements, news and changes. Please visit this page regularly.

Andrzej Kozek
Thu Feb 26 21:18:54 EST 2004
What is Plagiarism?

The Academic Senate in June 2001 approved policies and procedures to ensure that the University takes a consistent and equitable approach to plagiarism. The Senate adopted the following definition of plagiarism.

Definition: Plagiarism involves using the work of another person and presenting it as one's own. Any of the following acts constitutes plagiarism unless the source of each quotation or piece of borrowed material is clearly acknowledged.

a) copying out part(s) of any document or audio-visual material (including computer based material);

b) using or extracting another person's concepts, experimental results, or conclusions;

c) summarising another person's work;

d) in an assignment where there was collaborative preparatory work, submitting substantially the same final version of any material as another student.

Encouraging or assisting another person to commit plagiarism is a form of improper collusion and may attract the same penalties which apply to plagiarism.

Opportunities and temptations for plagiarism have increased with the spread of internet access. Plagiarism is a serious threat to the teaching and accreditation process, and seriously undermines the collegial and ethical principles which underpin the work of a University.

2) The Dangers of Plagiarism and How to Avoid it

The integrity of learning and scholarship depends on a code of conduct governing good practise and acceptable academic behaviour. One of the most important elements of good practise involves acknowledging carefully the people whose ideas we have used, borrowed, or developed. All students and scholars are bound by these rules because all scholarly work depends in one way or another on the work of others.

Therefore, there is nothing wrong in a student using the work of others as a basis for their own work, nor is it evidence of inadequacy on the student’s part, provided they do not attempt to pass off someone else’s work as their own.

To maintain good academic practice, so that a student may be given credit for their own efforts, and so that their own contribution can be properly appreciated and evaluated, they should acknowledge their sources and they should ALWAYS:

i) state clearly in the appropriate form where they found the material on which they have based their work, using the system of reference specified by the Division in which their assignment was set;

ii) acknowledge the people whose concepts, experiments, or results they have extracted, developed, or summarised, even if they put these ideas into their own words;

iii) avoid excessive copying of passages by another author, even where the source is acknowledged. Find
another form of words to show that the student has thought about the material and understood it, but stating clearly where they found the ideas.

If a student uses the work of another person without clearly stating or acknowledging their source, the result is falsely claiming that material as their own work and committing an act of PLAGIARISM. This is a very serious violation of good practice and an offence for which a student will be penalised.

A STUDENT WILL BE GUILTY OF PLAGIARISM if they do any of the following in an assignment, or in any piece of work which is to be assessed, without clearly acknowledging their source(s) for each quotation or piece of borrowed material:

a) copy out part(s) of any document or audio-visual material, including computer-based material;

b) use or extract someone else's concepts or experimental results or conclusions, even if they put them in your words;

c) copy out or take ideas from the work of another student, even if they put the borrowed material in their own words;

d) submit substantially the same final version of any material as a fellow student. On occasions, a student may be encouraged to prepare their work with someone else, but the final form of the assignment must be their own independent endeavour.

3) Examples

The following are examples of plagiarism, scaled from the mildest to most serious offences, which may be collectively known as "The Plagiarism Continuum" (Walker, J. (1998) "Student Plagiarism in Universities: What Are We Doing About It?" Higher Education Research and Development, 17, 1, 89-105)

"Sham paraphrasing": Material copied verbatim from text and source acknowledged but represented as paraphrased.

"Illicit paraphrasing": Material paraphrased from text without acknowledgement of source.

"Other plagiarism": Material copied from another student's assignment with the knowledge of the other student.

"Verbatim copying": Material copied verbatim from text without acknowledgement of the source.

"Self-plagiarism" or "recycling": Same assignment submitted more than once for different courses.

"Ghostwriting": Assignment written by a third party and represented by student as own work.

"Purloining": Assignment copied from another student's assignment or other person's paper without the person's knowledge.

4) Procedures that will be followed in cases of suspected plagiarism

It is recognised that different kinds of plagiarism take place and require different approaches and procedures. However it is in the interests of natural justice for all parties to have a consistent set of procedures and penalties. The Academic Senate has approved the following procedures to be followed in cases of suspected plagiarism.

The level of intent to deceive and the extent of the plagiarism should be the principal criteria for determining penalties. For example, a deliberate intention to deceive and gain unwarranted advantage will attract severe penalties, as will copying essays and assignments in whole from other students or other sources.
The staff member who suspects an instance of plagiarism will report the situation to the convenor of the unit involved, or to the Head of Department (if the staff member in question is the convenor), or to any other person designated by the Head of Division as appropriate. After discussion, if the Chair agrees that the case warrants more than a warning, the student will be informed in writing of the nature of the complaint and given an opportunity to respond in writing. If the response indicates that there is a case to answer, it will be referred in writing to the Head of Division with a recommendation about a penalty.

The Head of Division may then call for further discussion, or sign off on the recommended penalty. This should be in writing.

Where the Head of Division feels the case is particularly serious or requires further investigation, the case may be referred to the Vice-Chancellor via the Registrar and Vice-Principal. The Vice-Chancellor may refer the case to the University Discipline Committee.

Under all circumstances where the Head of Division finds that plagiarism has occurred, a form (see below) will be added to the student's file. The student will be given the opportunity to add a comment to the record and will be asked to sign the form. A copy of the form will also be given to the student.

STUDENT RECORD OF PLAGIARISM

Student Name:

Student Number:

Division of Enrolment:

Unit of Study:

Unit Chair:

Year and Semester of Offering:

Task Involved:

Proportion of value of unit assessment (%):

This student has been found to have committed plagiarism under the following circumstances:

....................................................................................................................
....................................................................................................................
....................................................................................................................

Were other students involved? Give details:

....................................................................................................................
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....................................................................................................................

The offence was deemed to be: Minor Moderate Severe

The student was counselled : Yes No

The student admits plagiarism was deliberate: Yes No

The following penalties were applied:

....................................................................................................................
....................................................................................................................
....................................................................................................................

Signed: Student:

The student has received a copy of this form: Yes No

5) Penalties

Offences of plagiarism will attract penalties which may vary from counselling and a warning, the deduction of all marks for the assignment, to failure in the unit and reference to the University Discipline Committee. The penalty will depend upon the extent of the plagiarism, whether it is a first or repeated offence, whether there is evidence of deliberate deceit and whether advantage has been taken of another student.

Procedures To Be Followed In Suspected Cases Of Plagiarism

Plagiarism Form

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For more information consult the Contact Information Page

http://www.student.mq.edu.au/plagiarism/