STAT825

Statistics Project

S1 External 2017

Dept of Statistics

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Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

General Information

Unit convenor and teaching staff Petra Graham petra.graham@mq.edu.au
Credit points 4
Prerequisites Admission to MAppStat and (32cp in BCA or STAT units at 800 level or above)
Corequisites (STAT806 or STAT810) and STAT811 and STAT821 and STAT878
Co-badged status
Unit description This unit comprises a project which either reviews or develops an area of methodology or which discusses the use of statistical methods in a particular subject area.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

On successful completion of this unit, you will be able to:

Demonstrate a deep understanding of statistical theory and methods.

Identify statistical methods for data from a broad range of statistical applications.

Apply appropriate statistical models/methods and relevant statistical data analysis.

Apply the latest computational techniques and modern statistical software packages in data analysis.

Interpret statistical results and write a report.

Demonstrate the ability to undertake statistics project independently.

General Assessment Information

Late Submission

Extension is possible with permission of the Unit Convenor. Students should also be aware of the Disruption to Studies Policy http://www.mq.edu.au/policy/docs/disruption_studies/policy.htm

l and http://students.mq.edu.au/student_admin/manage_your_study_program/disruption_to_studies/

Academic Honesty Policy

Academic honesty is an integral part of the core values and principles contained in the Macquarie University Ethics Statement. Its fundamental principle is that all staff and students act with integrity in the creation, development, application and use of ideas and information. You must read the University's policy on Academic Honesty. This can be found on the MQ web site at:

http://www.mq.edu.au/policy/docs/academic_honesty/policy.html.

Penalties may include a deduction of marks, failure in the unit, and/or referral to the University Discipline Committee.

Examination and grading

The project supervisor will send the Unit Convenor his/her comments on the overall quality of the project, the degree of independence of the work and the student's engagement with the project. Two examiners will examine your project and provide numerical marks according to the Marking Guide below. These marks are then averaged to give the final grade (with a numerical mark) of HD, D, Cr, P or F for your project.

Marking scheme for STAT825 (Statistics Project)

Aspects	Item
Project Description (10%)	Background: Rationale for project
	Aim: Clear statement of objectives
	Other:
Statistical Methods (30%)	Understanding of the key statistical issues
	Appropriate choices of statistical methods
	Adequate justification and explanation of methods chosen
	Other:
Data Analysis/Simulation (30%)	Clear data/simulation description
	Initial data/simulation analysis, cleaning and manipulation
	Correct implementation, including software
	Other:

Presentation of Data/Results (10%)	Quality and appropriateness of tables
	Quality and appropriateness of graphs
	Other:
Interpretation of Results (10%)	Understanding statistical principles (CIs, tests, power, etc)
	Correct summaries of results
	Discussion of model successes and limitations
	Conclusions consistent with results
	Other:
Presentation/ Writing (10%)	Clear, concise, correct English
	Appropriate referencing
	Other:

The marking will take into account all aspects mentioned in the Scope of the Project.

Description of final grades is given in

http://www.mq.edu.au/policy/docs/assessment/schedule_1.html

Note: Students must be aware that there is only one opportunity to submit the project.

Assessment Tasks

Name	Weighting	Hurdle	Due
Project report	100%	No	9 June 2017

Project report

Due: **9 June 2017**
Weighting: **100%**

Getting Started:

The first priority is to settle on a project topic that appeals to you and for which we can offer suitable supervision.

How do you decide on a project topic?

- Project topic related to your job.

Students who are currently in employment may choose a topic relevant to their job this has the advantage that they are able to work on their project during work hours and using the facilities in their office. If you are in this position then you need to select a supervisor who is familiar with your proposed field of investigation. In the first instance you should discuss the availability of such supervision with the Unit Convenor. If we are unable to offer suitable supervision for your chosen topic you may need to select a different topic, or seek an external supervisor after consulting the Unit Convenor.

- Project topic suggested by a member of staff

Most students obtain their project topic this way. The procedure is for the student to approach one or maybe several members of staff and to discuss possible subject areas that are of interest to the staff member concerned. The research interests of our department staff are available at http://www.stat.mq.edu.au/our_staff. If you have difficulties to locate a supervisor you may seek help from the Unit Convenor.

Out of these discussions the student will choose or be guided to a particular topic. The student must then secure the agreement of the staff member concerned to supervise the topic. Bear in mind that you are asking the staff member to commit considerable time to work with you. Many supervisors will prefer you to work on a project of their choosing, particularly if you do not have very specific plans of your own, as the work will then have continuing benefit and support from both participants. You should communicate with your supervisor regularly by email or in person (eg once per week), regarding your project.

When you have found a member of staff who is willing to supervise your project you must email the Unit Convenor the supervisor's name and the project topic.

Some topics from previous Masters projects:

- The EM and EMS methods for image reconstruction in emission tomography.
- Time series analysis of beach pollution monitoring data
- The impact of transmission lines on the vegetation of Ku-Ring-Gai Chase National Park.
- Evaluating quality in an academic teaching unit
- The effects of rotation group bias on estimates of unemployment from the monthly labour force survey.
- Censored data and the lognormal distribution.
- A comparison of several methods for analysing clustered binary data - a simulation study.
- Housing prices in Sydney: a statistical analysis.
- Sudden infant death syndrome.
- The Effect of Body Mass Index on Intermediate Outcomes in the Treatment of Infertility

- Predictors of Growth Amongst Young Children in Sydney
- A Churn Analysis of a General Insurance Portfolio.

Requirements of the project:

1. Scope of the Project

The project should involve at least some (but not necessarily all) of the following:

- Data collection and/or sampling with appropriate analysis and reporting of results. It is often the case that there are several plausible models for representing the data. Alternative models in such cases should be considered and some justification given for the particular form of analysis chosen.
- Literature search and review. The Science Citation Index, the Current Index of Statistics and the CD-ROM directories in the Library are invaluable tools for such work. Also Mathematical Reviews and Zentralblatt für Mathematik may be useful.
- Problem formulation, model specification and analysis. This is best illustrated by an example: Suppose a non-standard experimental design has been used in the generation of a set of data. The first task would be to explain the objectives of the experiment, then to explain carefully the nature of the experimental design and to detail any features of the implementation of the experiment that may influence the model chosen to represent the data and its subsequent analysis. This would all come under the heading of 'problem formulation'. The model specification and analysis may involve, for example, proposing an analysis of variance table as well as justification for the particular tests used. This clearly has a number of ingredients in common with the first category (Data collection etc.) however the first category will include problems where standard designs are used and interest is focused on the results of the experiment rather than in the present case where the design and its analysis are at least as important as the interpretation of the data.
- Survey of recent developments in a field. This will involve literature search and review with the above suggestions relevant.
- Simulation.

2. Format

The project report should include the following items:

- Title page (including unit code, eg, STAT 825)
- Signed declaration by student (a short declaration about the evidence of the student's work, following the lines of "I declare this project is evidence of my own work, with direction and assistance provided by my project supervisor. This work has not been

previously submitted for academic credit.”)

- Supervisor statement
- Abstract
- Content page(s)
- Main body of the project in sections (or chapters) with the following recommended headings:
    - Introduction
    - Methods
    - Results
    - Discussion and Conclusion
    - References (or Bibliography) (Note:You shall check with your supervisor for reference Style/Format.)
- Appendix

As sections of your first draft are written ask your supervisor to read them and comment. Then work on the suggestions and rewrite. The sooner your supervisor gets a chapter draft the sooner you will get it back and the longer the time you will have to respond to it.

Note that the project must be typed using a word processor with mathematical capability, if necessary. Do not include vast amounts of computer printout in your appendix unless it is absolutely essential to do so. Mostly, it will not be looked at and it causes irritation to the reader as it adds excessive bulk.

3. Length

Excluding index, references and appendices, the project length should be between 8,000 and 11,000 words although for certain topics (for example those with considerable theoretical content) fewer than 8,000 words may be acceptable.

4. Standard of English

The project needs to be written up in English of an acceptable standard. If English is not your first language, you should seek the help of an English-speaking person to correct your grammar and spelling, or use the services of professional editors.

5. Submission of the Project

At the completion of the project, before submission for assessment, the supervisor is asked to write a brief statement of no more than half a page, commenting on the degree of independence of the work, the quality of the student’s engagement with the project, and how they tackled problems and challenges such as communication issues and timelines.

Projects have to be submitted by Friday the 9th of June 2017 (the last day of the teaching period of the session).

Three spiral-bound copies should be submitted to the Unit Convenor in person, via your supervisor or by mail. One copy is for your supervisor to keep, and the other two copies will be

examined by two markers. Along with the hard copies of the project, electronic submission (*.pdf or *.doc, not a scanned copy) must also be made through iLearn. All submissions will be passed through Turnitin.

On successful completion you will be able to:

- Demonstrate a deep understanding of statistical theory and methods.
- Identify statistical methods for data from a broad range of statistical applications.
- Apply appropriate statistical models/methods and relevant statistical data analysis.
- Apply the latest computational techniques and modern statistical software packages in data analysis.
- Interpret statistical results and write a report.
- Demonstrate the ability to undertake statistics project independently.

Delivery and Resources

Technology used and required

This unit is a Master of Applied Statistics Project. There will be no lectures, practicals or tutorials.

Changes since the last offering of this unit

No major differences from previous offering.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central. Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy http://mq.edu.au/policy/docs/assessment/policy_2016.html

Grade Appeal Policy http://mq.edu.au/policy/docs/gradeappeal/policy.html

Complaint Management Procedure for Students and Members of the Public http://www.mq.edu.au/policy/docs/complaint_management/procedure.html

Disruption to Studies Policy (in effect until Dec 4th, 2017): http://www.mq.edu.au/policy/docs/disruption_studies/policy.html

Special Consideration Policy (in effect from Dec 4th, 2017): https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/special-consideration

In addition, a number of other policies can be found in the Learning and Teaching Category of Policy Central.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/support/student_conduct/

Results

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au.

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- Workshops
- StudyWise
- Academic Integrity Module for Students
- Ask a Learning Adviser

Student Services and Support

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

PG - Capable of Professional and Personal Judgment and Initiative

Our postgraduates will demonstrate a high standard of discernment and common sense in their professional and personal judgment. They will have the ability to make informed choices and

decisions that reflect both the nature of their professional work and their personal perspectives.

This graduate capability is supported by:

Learning outcomes

- Demonstrate a deep understanding of statistical theory and methods.
- Identify statistical methods for data from a broad range of statistical applications.
- Apply appropriate statistical models/methods and relevant statistical data analysis.
- Apply the latest computational techniques and modern statistical software packages in data analysis.
- Interpret statistical results and write a report.
- Demonstrate the ability to undertake statistics project independently.

Assessment task

- Project report

PG - Discipline Knowledge and Skills

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen fields.

This graduate capability is supported by:

Learning outcomes

- Demonstrate a deep understanding of statistical theory and methods.
- Identify statistical methods for data from a broad range of statistical applications.
- Apply appropriate statistical models/methods and relevant statistical data analysis.
- Apply the latest computational techniques and modern statistical software packages in data analysis.
- Interpret statistical results and write a report.
- Demonstrate the ability to undertake statistics project independently.

Assessment task

- Project report

PG - Critical, Analytical and Integrative Thinking

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

Learning outcomes

- Demonstrate a deep understanding of statistical theory and methods.
- Identify statistical methods for data from a broad range of statistical applications.
- Apply appropriate statistical models/methods and relevant statistical data analysis.
- Apply the latest computational techniques and modern statistical software packages in data analysis.
- Interpret statistical results and write a report.
- Demonstrate the ability to undertake statistics project independently.

Assessment task

- Project report

PG - Research and Problem Solving Capability

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

Learning outcomes

- Demonstrate a deep understanding of statistical theory and methods.
- Identify statistical methods for data from a broad range of statistical applications.
- Apply appropriate statistical models/methods and relevant statistical data analysis.
- Apply the latest computational techniques and modern statistical software packages in data analysis.
- Interpret statistical results and write a report.
- Demonstrate the ability to undertake statistics project independently.

Assessment task

- Project report

PG - Effective Communication

Our postgraduates will be able to communicate effectively and convey their views to different social, cultural, and professional audiences. They will be able to use a variety of technologically supported media to communicate with empathy using a range of written, spoken or visual formats.

This graduate capability is supported by:

Learning outcomes

- Interpret statistical results and write a report.
- Demonstrate the ability to undertake statistics project independently.

Assessment task

- Project report

PG - Engaged and Responsible, Active and Ethical Citizens

Our postgraduates will be ethically aware and capable of confident transformative action in relation to their professional responsibilities and the wider community. They will have a sense of connectedness with others and country and have a sense of mutual obligation. They will be able to appreciate the impact of their professional roles for social justice and inclusion related to national and global issues

This graduate capability is supported by:

Learning outcomes

- Interpret statistical results and write a report.
- Demonstrate the ability to undertake statistics project independently.

Assessment task

- Project report

Changes from Previous Offering

Student declaration and supervisor statement were added in the format of the project.

Changes since First Published

Date	Description
16/02/2017	Learning outcomes have been updated.