STAT723
Statistical Graphics
S1 Day 2014

Statistics

Contents

General Information 2
Learning Outcomes 2
Assessment Tasks 3
Delivery and Resources 5
Policies and Procedures 6

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
Unit Convenor
Peter Petocz
peter.petocz@mq.edu.au
Contact via peter.petocz@mq.edu.au

Credit points
4

Prerequisites
Admission to MRes

Corequisites

Co-badged status
Stat723 is co-badged with Stat823

Unit description
We present the principles of effective graphical presentation, set them in a historical context and apply them to a variety of statistical data sets. Emphasis is given to use of modern multivariate graphical techniques such as trellis/lattice graphs and mosaic plots to show a variety of displays of data and model fits, and to display model consistency with data. To present graphics, we introduce and use S-Plus and R software, as well as other standard packages. Participants choose an area for further investigation related to their interests.

Important Academic Dates
Information about important academic dates including deadlines for withdrawing from units are available at https://students.mq.edu.au/important-dates

Learning Outcomes

1. 1. be familiar with important historical and contemporary examples of graphics, and be able to use them as models in their own work
2. 2. be aware of the elements of graphical design, and use them to critically appraise presented graphics in articles and web pages and suggest appropriate ways of improving them
3. 3. be familiar with a range of modern multivariate graphical techniques and know when it is appropriate to use them
4. 4. be able to use the computer to generate appropriate graphics using particular
packages or languages and be able to develop the ability to do so in others

5. use statistical graphics to investigate and analyse data, check statistical model assumptions and effectively present the results of statistical investigations to a range of audiences

6. be aware of the ethical aspects associated with the use of statistical graphics in society

Assessment Tasks

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portfolio</td>
<td>25%</td>
<td>Monday 9 May</td>
</tr>
<tr>
<td>Project</td>
<td>40%</td>
<td>Monday 9 June</td>
</tr>
<tr>
<td>Take-home exam</td>
<td>35%</td>
<td>Saturday 14 June</td>
</tr>
</tbody>
</table>

Portfolio

Due: Monday 9 May
Weighting: 25%

An individual portfolio of five items relating to statistical graphics, each item using a maximum of two pages, on topics or questions presented in classes (and on the website). You will be asked to submit these online, and they will be graded on a scale of 1-5 each.

This Assessment Task relates to the following Learning Outcomes:

- 1. be familiar with important historical and contemporary examples of graphics, and be able to use them as models in their own work
- 2. be aware of the elements of graphical design, and use them to critically appraise presented graphics in articles and web pages and suggest appropriate ways of improving them
- 3. be familiar with a range of modern multivariate graphical techniques and know when it is appropriate to use them
- 4. be able to use the computer to generate appropriate graphics using particular packages or languages and be able to develop the ability to do so in others
- 5. use statistical graphics to investigate and analyse data, check statistical model assumptions and effectively present the results of statistical investigations to a range of audiences
6. be aware of the ethical aspects associated with the use of statistical graphics in society

**Project**

Due: **Monday 9 June**  
Weighting: **40%**

A (solo or paired) project in a selected area of interest, including (individual) presentation (15%) and a written summary (25%). The presentations will be made during class in week 12 (Thursday 5 June) and the written summary is due by Monday 9 June.

This Assessment Task relates to the following Learning Outcomes:

• 1. be familiar with important historical and contemporary examples of graphics, and be able to use them as models in their own work
• 2. be aware of the elements of graphical design, and use them to critically appraise presented graphics in articles and web pages and suggest appropriate ways of improving them
• 3. be familiar with a range of modern multivariate graphical techniques and know when it is appropriate to use them
• 4. be able to use the computer to generate appropriate graphics using particular packages or languages and be able to develop the ability to do so in others
• 5. use statistical graphics to investigate and analyse data, check statistical model assumptions and effectively present the results of statistical investigations to a range of audiences
• 6. be aware of the ethical aspects associated with the use of statistical graphics in society

**Take-home exam**

Due: **Saturday 14 June**  
Weighting: **35%**

You will be given an individual take-home examination during the last week of semester (available on the morning of Saturday 7 June, due by the evening of Saturday 14 June). This will be in the form of a consulting problem requiring data analysis and preparation of a report including presentation graphics, requiring about 3-6 hours work.

This Assessment Task relates to the following Learning Outcomes:
• 2. be aware of the elements of graphical design, and use them to critically appraise
presented graphics in articles and web pages and suggest appropriate ways of
improving them
• 3. be familiar with a range of modern multivariate graphical techniques and know when it
is appropriate to use them
• 4. be able to use the computer to generate appropriate graphics using particular
packages or languages and be able to develop the ability to do so in others
• 5. use statistical graphics to investigate and analyse data, check statistical model
assumptions and effectively present the results of statistical investigations to a range of
audiences
• 6. be aware of the ethical aspects associated with the use of statistical graphics in
society

Delivery and Resources

You will have one 2-hour lecture class on Thursday 9-11 in E4B-G214 and one 1-hour practical
class Thursday 11-12 or 12-1 in E4B-102 (the second of these options will only be used if the
class is large enough). If possible, you should attend these classes; but if you are enrolled
externally there will be options for participation: materials on iLearn, recorded sessions and
conferencing software.

There is no specified textbook for this unit and a variety of readings will be made available
internet. The following books are good general references that will be used during the semester:

  Beautiful Evidence (2006) by the same author.
  Springer-Verlag, Berlin. (Available in the library as an electronic resource.)

With the relatively number of students enrolled and the advanced (masters) level of this unit, we
will be relying less on formal lectures and more on individual reading, preparation and learning to
use the computer, and on collaborative investigation and discussion of problems. However, we
will have a number of ‘guest lectures’ which will be presented live and be available in some
electronic form afterwards. There will be weekly readings (usually electronic), weekly data
investigations (using a computer package or language), weekly discussions (live or electronic)
and regular opportunities to create and add materials to your portfolio. Live class discussions will
be recorded and the recording placed on the iLearn site soon after.
Technologies Used: The unit will make use of a range of packages, most importantly R, and the graphing packages Mondrian and GGobi.

What has changed from previous years: In previous years we made use of the package SPlus, but this year we will replace the emphasis on this by using R (though SPlus may also be used to a smaller extent).

**Policies and Procedures**

Macquarie University policies and procedures are accessible from [Policy Central](http://mq.edu.au/policy/docs/academic_honesty/policy.html).

Students should be aware of the following policies in particular with regard to Learning and Teaching:


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/](https://students.mq.edu.au/support/student_conduct/)

**Late Assessment Tasks** No extensions will be granted for any assessment tasks. Students who have not submitted the task prior to the deadline will be awarded a mark of 0 for the task, except for cases in which you have made an application for special consideration and this has been approved by the lecturer.

**Student Support**

Macquarie University provides a range of support services for students. For details, visit [http://students.mq.edu.au/support/](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 Enquiry Service
For all student enquiries, visit Student Connect at ask.mq.edu.au

Equity 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.

IT Help
For help with University computer systems and technology, visit http://informatics.mq.edu.au/help.

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