STAT823
Statistical Graphics
S1 External 2015
Dept of Statistics

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General Information

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TBA

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Credit points
4

Prerequisites
Admission to MAppStat or PGDipAppStat or PGCertAppStat or GradDipAppStat or (STAT830 and admission to (MBiotech or MBioBus))

Corequisites

Co-badged status

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. This unit is appropriate for study at any stage of the student's: as an introduction early in the program, or as an overview towards the end of the program.

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:

Be familiar with important historical and contemporary examples of graphics, and be able to use them as models in their own work.

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.

Be familiar with a range of modern multivariate graphical techniques and know when it is appropriate to use them.

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.

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.

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

General Assessment Information

Late assessments will only be marked if a valid Disruption to Studies has been submitted.

Assessment Tasks

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Due</th>
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</thead>
<tbody>
<tr>
<td>Portfolio</td>
<td>25%</td>
<td>TBA</td>
</tr>
<tr>
<td>Project</td>
<td>25%</td>
<td>11:55 pm 1 June 2015</td>
</tr>
<tr>
<td>Project Presentation Slides</td>
<td>15%</td>
<td>9:55 am 28 May 2015</td>
</tr>
<tr>
<td>Take-home Exam</td>
<td>35%</td>
<td>11:55 pm Saturday 6 June</td>
</tr>
</tbody>
</table>

Portfolio

Due: TBA
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 on the website. You will be asked to submit these on ilearn as a slide presentation with voice over and they will be graded on a scale of 1-5 each. Some suggested software to do this can be found from the following website: http://elearningindustry.com/top-10-free-camtasia-studio-alternatives, you may use other...
software. The portfolio items will have various suggested due dates, but the complete series will have a final deadline of Monday 4 May.

On successful completion you will be able to:

- Be familiar with important historical and contemporary examples of graphics, and be able to use them as models in their own work.
- 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.
- Be familiar with a range of modern multivariate graphical techniques and know when it is appropriate to use them.
- 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.
- 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.
- Be aware of the ethical aspects associated with the use of statistical graphics in society.

Project

Due: **11:55 pm 1 June 2015**
Weighting: **25%**

A solo project in an area of interest that you select. A written report must be submitted (maximum length 3500 words) on iLearn as pdf.

On successful completion you will be able to:

- Be familiar with important historical and contemporary examples of graphics, and be able to use them as models in their own work.
- 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.
- Be familiar with a range of modern multivariate graphical techniques and know when it is appropriate to use them.
- 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.
- 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.
• Be aware of the ethical aspects associated with the use of statistical graphics in society.

Project Presentation Slides

Due: 9:55 am 28 May 2015
Weighting: 15%

Presentation of Project. Should be ten minutes long. Must be a slide presentation with voice over submitted on iLearn. Some suggested software to do this can be found from the following website: http://elearningindustry.com/top-10-free-camtasia-studio-alternatives, you may use other software.

On successful completion you will be able to:
• Be familiar with important historical and contemporary examples of graphics, and be able to use them as models in their own work.
• 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.
• Be familiar with a range of modern multivariate graphical techniques and know when it is appropriate to use them.
• 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.
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Take-home Exam

Due: 11:55 pm Saturday 6 June
Weighting: 35%

You will be given an individual take-home examination at the end of Week 12 (available on the morning of Saturday 30 May). 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. A word processed written report must be submitted as a pdf on iLearn.

On successful completion you will be able to:
• Be familiar with important historical and contemporary examples of graphics, and be able to use them as models in their own work.
• 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.

• Be familiar with a range of modern multivariate graphical techniques and know when it is appropriate to use them.
• 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.
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• Be aware of the ethical aspects associated with the use of statistical graphics in society.

Delivery and Resources

For the internal students there is one 2 hour lecture in E4B 214 followed by a 1 hour practical in EMC G210. 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 on iLearn. The following books are good general references that will be used during the semester:


With the relatively small 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.

Technologies used The unit will make use of a range of packages, most importantly R, and the graphing packages Mondrian and GGobi.

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:
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
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

- Be familiar with important historical and contemporary examples of graphics, and be able to use them as models in their own work.
- 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.
- Be familiar with a range of modern multivariate graphical techniques and know when it is appropriate to use them.
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- 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.
- Be aware of the ethical aspects associated with the use of statistical graphics in society.

Assessment tasks

- Portfolio
- Project
- Project Presentation Slides
- Take-home Exam

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**

- Be familiar with important historical and contemporary examples of graphics, and be able to use them as models in their own work.
- 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.
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**Assessment tasks**

- Portfolio
- Project
- Project Presentation Slides
- Take-home Exam

**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**

- Be familiar with important historical and contemporary examples of graphics, and be able to use them as models in their own work.
- Be familiar with a range of modern multivariate graphical techniques and know when it is appropriate to use them.
- 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.

**Assessment tasks**

- Portfolio
- Project
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**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**

- Be familiar with important historical and contemporary examples of graphics, and be able
to use them as models in their own work.
- 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.
- 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.

**Assessment tasks**

- Portfolio
- Project
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**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

• Be familiar with important historical and contemporary examples of graphics, and be able to use them as models in their own work.
• 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.

Assessment tasks

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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

• Be familiar with important historical and contemporary examples of graphics, and be able to use them as models in their own work.
• 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.
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