Lecturer

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Recommended reading

There is no prescribed text for this unit. The following are useful references:

- Online SAS manual:
  http://support.sas.com/onlinedoc/913/docMainpage.jsp

*The first three texts are on 3-day loan.*

Some references to texts on Generalized Linear Models using SAS are given on
http://www.statsci.org/glm/books.html

Distance mode

Distance students will be receiving printed course notes via mail. You will be alerted by email when material has been mailed out, so if you do not receive these within a few days then please contact Lesley Mooney, the Postgraduate Administrator in the Department of Statistics (phone: (02) 9850 8550 e-mail lmooney@efs.mq.edu.au).

Completed assignments may mailed to the lecturer at
Department of Statistics, Macquarie University, NSW 2109, Australia
or e-mailed or faxed.
On-campus mode

Lectures will be held on Monday evenings. From 6pm to approximately 7.30pm the lecture will be in E5A 131. After that there is a computing session, held in E4B 306, till 9pm.

Software

We will be using the software SAS version 9. Should you need your own version of SAS, you can obtain a fully working version (with one year’s licence). Please see separate handout concerning this.

WebCT

We will be using WebCT for bulletin board discussions, and posting of assignments, solutions and data sets. The link is http://online.mq.edu.au/webct/homearea/homearea? which you should bookmark.

You are encouraged to use the bulletin board for discussions on the course material. Remember that if you are confused about something, the chances are that other students are also confused. Everybody benefits from the discussions, and you should not be embarrassed to admit that you do not understand a concept.

Your WebCT login is your Student ID Number (as found on your Campus Card). Your WebCT password is the same password used to access myMQ, as supplied to you on enrolment.

iLecture: digital (audio) recordings of lectures

Audio recordings of the lectures will be available on the WebCT site, the day after the lecture is delivered. Instructions on the use of the iLecture system is provided in the iLecture Quick Guide, accessed from http://online.mq.edu.au/uw/quickguides.html.

Web sites

The public web site for the course is at http://www.stat.mq.edu.au/units/stat811/. A very helpful web site is http://www.statsci.org/glm/.

Timetable

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<th>Week</th>
<th>Lecture</th>
<th>Assessment</th>
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<tr>
<td>1</td>
<td>30 July</td>
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<tr>
<td>2</td>
<td>6 August</td>
<td>Assignment 1 handed out</td>
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<td>3</td>
<td>13 August</td>
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<td>4</td>
<td>20 August</td>
<td>Assignment 1 handed in</td>
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<td>5</td>
<td>27 August</td>
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<td>6</td>
<td>3 September</td>
<td>Assignment 2 handed out</td>
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<td>Week</td>
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<tr>
<td>1</td>
<td>The classical normal linear model</td>
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| 2    | Introduction to GLMs  

The framework of generalized linear models is introduced, and the theory behind maximum likelihood estimation of the parameters started. |
| 3    | Maximum likelihood estimation of the parameters; Poisson regression for count data |
| 4    | Inference; comparison of models  

The deviance as a measure of fit; hypothesis testing |
| 5    | Model checking  

Definition of residuals in GLMs; checking for violation of model assumptions |
| 6    | Model selection; overdispersion  

Selection of models via AIC; the phenomenon of overdispersion; compound Poisson models to overcome it; the negative binomial model for counts |
| 7    | Overdispersion contd; binary responses  

Quasi-likelihood as an alternative method to overcome overdispersion; logistic regression for binary responses |
| 8    | No lecture |
| 9    | Logistic regression contd |
| 10   | Ordinal and categorical responses  

Models in which the response is ordinal (e.g. none/mild/moderate/severe) or categorical (e.g. walk/bus/train/car) |
<p>| 11   | Correlated data |</p>
<table>
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<tr>
<th>Week</th>
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<tr>
<td></td>
<td>Models for longitudinal data, and other data structures in which there is clustering or correlation between observations</td>
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<tr>
<td>12</td>
<td>Correlated data contd</td>
</tr>
<tr>
<td>13</td>
<td>Generalized additive models; more correlated data</td>
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<tr>
<td></td>
<td>Models in which no parametric form of the systematic part of the model is specified; more on correlated data</td>
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**Examination**

There will be a two-hour sit-down examination, and a take-home examination which you have four days to complete. You will be permitted to bring an A4 sheet of notes, handwritten or typed, on both sides, into the sit-down examination.

Please note that students who have not performed satisfactorily in the assignments, will not be permitted to write either the sit-down or the take-home examination. Any student who is to be excluded from the examinations, will be notified in writing of this after the due date of the last assignment.

**Assessment** will be as follows:

Three assignments 45%

Examination:

- Sit-down component 25%
- Take-home component (4 days) 30%

*In order to pass the unit, students need to perform satisfactorily on all components of assessment (assignments and examinations).*

**Plagiarism**

Please read the University’s plagiarism policy carefully at [http://www.student.mq.edu.au/plagiarism/](http://www.student.mq.edu.au/plagiarism/).