MATH5806

APPLIED REGRESSION ANALYSIS

Semester 1, 2015
MATH5806 – Course Outline

Information about the course

Course Authority and lecturer:

Dr Peter Straka, Room RC-1033, Phone 9385 7024, email p.straka@unsw.edu.au

Consultation:

We will decide on suitable time slots in the first lecture. These may then be booked on moodle.

Credit, Prerequisites, Exclusions:

This course counts for 6 Units of Credit (6UOC).
Prerequisite: Math5856 or equivalent.
Exclusion: Math3821.

Lectures:

The lectures run from weeks 1 to 12:

<table>
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<th>Tuesdays 5:00-8:00pm</th>
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<td>Room: ElecEng-218</td>
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Syllabus:

The topics covered in this course include (and are subject to change): linear regression; transformations and diagnostics; weighted least squares; hypothesis testing; prediction intervals; analysis of variance; variable selection; generalised cross-validation; penalised regression methods; splines; thin plate splines; local likelihood; kernel smoothing; penalised splines; generalised additive models; projection pursuit regression; neural network regression; generalised linear models; exponential families; poisson, binomial regression; multinomial logit analysis; ordinal logistic regression.

The lectures will be complemented worked examples using R.
Tutorials:

There will be one lab tutorial in week 2. The room will be announced in week 1. In weeks 3-12, problem solving tutorials will be held in the lecture room.

Recommended reference books:

5. R manuals: http://www.r-project.org/

Lecture Notes

Lectures will be presented in slide form. All additional material will be posted on Moodle or elsewhere online.

Objective:

The aim of this course is to introduce students to modern regression models and to provide hands-on experience with computing methods needed for applications to real data.

The activities and assessment for the course will contribute to the core science graduate attributes of ‘Research, inquiry and analytical thinking abilities’, ‘Capability and motivation for intellectual development’ and ‘Communication’.

New ideas, skills and methods are introduced, discussed and demonstrated in lectures. Then students develop these skills by applying them to specific tasks in tutorials and assessments. Active student participation in tutorials is expected.

Assessments:

UNSW assesses students under a standards based assessment policy. For how this policy is applied in the School of Mathematics and Statistics see
http://www.maths.unsw.edu.au/currentstudents/assessment-policies

- There will be two assignments during the term of the session. These will have a mathematical and computational component. Each assignment will contribute 10% to the final mark for the course.

- Depending on students numbers, there will be individual or group projects. This will be a thorough statistical analysis, with a substantial amount of computational work. A professional report will be handed in, which details the data sets, methods and assumptions used, as well as inference and conclusions. Based on this report, a student’s ability to communicate statistics in writing will be assessed. If time allows, 10-15 minute in-class presentation will be given for each project, to also assess the ability to communicate statistics orally. This project will account for 30% of the final mark.

- The final exam will have purely written form and will account for 50% of the total mark.

**Important Administrative information:**

The school has strict rules for academic conduct and plagiarism. Information on these and matters concerning examination can be obtained via links on the course home page.

**Note**

The information contained herein is for general guidance of students and is as accurate as possible at the date of issue. You will be informed of any changes.

**Course Evaluation and Development**

The School of Mathematics and Statistics evaluates each course each time it is run. We carefully consider the student responses and their implications for course development. It is common practice to discuss informally with students how the course and their mastery of it are progressing.

**School Rules and Regulations**

Further rules and regulations, particularly on plagiarism and academic honesty, can be found at https://www.maths.unsw.edu.au/currentstudents/assessment-policies.