MATH5846 – Course Outline

Information about the course

Course Authority and lecturer:

Dr Yanan Fan, Room RC-2055, phone 9385 7034, email Y.Fan@unsw.edu.au

Consultation:

Consultation will be agreed upon between the students and the lecturer at a mutually convenient time, otherwise, they can be made by appointment.

Credit, Prerequisites, Exclusions:

This course counts for 6 Units of Credit (6UOC).
There are no prerequisites or exclusions for this course.

Lectures:

The lectures run from weeks 8 to 13:

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Week</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>Lecture 1</td>
<td>8</td>
<td>Random samples</td>
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<tr>
<td>Lecture 2</td>
<td>8</td>
<td>R intro and lab session + tutorial exercise</td>
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<tr>
<td>Lecture 3</td>
<td>9</td>
<td>Estimation + tutorial exercise</td>
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<tr>
<td>Lecture 4</td>
<td>9</td>
<td>Confidence intervals + R lab session</td>
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<td>Lecture 5</td>
<td>10</td>
<td>Hypothesis test + tutorial exercise</td>
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<tr>
<td>Lecture 6</td>
<td>10</td>
<td>Hypothesis test + R lab session</td>
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<tr>
<td>Lecture 7</td>
<td>11</td>
<td>Introduction to Bayesian inference</td>
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<tr>
<td>Lecture 8</td>
<td>11</td>
<td>Midsession test, no other lectures</td>
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<tr>
<td>Lecture 9</td>
<td>12</td>
<td>linear models + general linear models</td>
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<td>Lecture 10</td>
<td>12</td>
<td>model assessment and binomial models + R lab session</td>
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<tr>
<td>Lecture 11</td>
<td>13</td>
<td>Bayes linear models + tutorial</td>
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<tr>
<td>Lecture 12</td>
<td>13</td>
<td>Bayes linear models + R lab session</td>
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Tutorials:

There will be regular lab tutorials on Fridays in the Maths computing lab. Classroom tutorials will be carried out in the form of problem solving sessions throughout the course.

Recommended text/reference book:

2. R manual: http://cran.au.r-project.org/

Lecture Notes

All additional lecture materials including notes can be found on Blackboard 9 at http://lms-blackboard.telt.unsw.edu.au/

Objective:

The aim of this course is to provide students with general understanding of statistical theory and application. At the end of the course, students are expected to be familiar with undergraduate level statistical methods, and be proficient in the usage of the statistical programming language R.

Assessments:

- There will be three assignments during the term of the session. Each assignment will contribute 10% to the final mark for the course. 10% of each assignment mark will be allocated to clarity of presentation in the solutions.
- There will be a mid-session test, in week 11, worth 20% of the total mark.
- The end of session exam will be worth 50% of the total mark.

Course Description:

The aim of this course is to learn about the basic principles of statistical reasoning, the most important methods for estimating unknown parameters of a system and for
taking decisions without complete information, and the use of statistical packages. The methods discussed are for visualising data, for simulating random phenomena, for estimating parameters using Maximum Likelihood and Least Squares estimators, and for testing hypotheses. General Linear Models will be studied using R.

**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**


**Plagiarism and academic honesty**

Plagiarism is the presentation of the thoughts or work of another as one’s own. Issues you must be aware of regarding plagiarism and the university’s policies on academic honesty and plagiarism can be found at [https://my.unsw.edu.au/student/atoz/Plagiarism.html](https://my.unsw.edu.au/student/atoz/Plagiarism.html).