Unit Outline 2014
Faculty of Education, Science, Technology and Mathematics

Introduction to Statistics
6540
This Unit Outline must be read in conjunction with:

a) *UC Student Guide to Policies*, which sets out University-wide policies and procedures, including information on matters such as plagiarism, grade descriptors, moderation, feedback and deferred exams, and is available at *(scroll to bottom of page)*

b) *UC Guide to Student Services*, and is available at *(scroll to bottom of page)*

c) Any additional information specified in section 6h.

## 1: General Information

1a **Unit title:** *Introduction to Statistics*

1b **Unit number:** 6540

1c **Teaching Period and year offered:** *Semester 1, 2014*

1d **Credit point value:** 3

1e **Unit level:** 1

1f **Name of Unit Convener and contact details (including telephone and email)**
   Alice Richardson  
   Office: 6B13  
   Phone: 6201 2444  
   Email: alice.richardson@canberra.edu.au

1g **Administrative contact details (including name, location, telephone and email)**

   Faculty Administrative Office 6C38  
   [ESTeM-courseadvice@canberra.edu.au](mailto:ESTeM-courseadvice@canberra.edu.au)  
   6201 2400
2: Academic Content

2a Unit description and learning outcomes

This unit introduces students to statistical techniques in a wide range of fields, with a concentration on the biological, health and social sciences. The focus of the unit is the collection, description and analysis of data with an emphasis on exploratory and graphical methods. Students are introduced to the statistical package SPSS. Topics include surveys and experiments; tables and graphs; measures of location and dispersion; basic probability; the scientific method; estimation; hypothesis testing; linear regression modelling and linear correlation.

A student will be expected to (1) be able to understand the nature and consequences of natural variability in data; (2) express a problem in statistical terms; (3) summarise data graphically and statistically, either manually or using SPSS; (4) estimate and test parameters in simple situations; (5) model data by fitting straight lines and (6) understand basic statistical terminology in published material.

2b Generic skills

The University recognises that individuals entering its programs bring with them a diversity of personal and professional attributes that should be further developed by their experience as students and graduates of the University. These generic skills can be accessed at: https://guard.canberra.edu.au/policy/policy.php?pol_id=3030

By the end of their course, graduates will have developed skills and attributes in:

1. Communication
   The ability to present knowledge, ideas and opinions effectively and communicate within and across professional and cultural boundaries

2. Analysis and inquiry
   The ability to gather information, and to analyse and evaluate information and situations in a systematic, creative and insightful way

3. Problem solving
   The ability to apply problem-solving processes in novel situations; to identify and analyze problems then formulate and implement solutions

4. Working independently and with others
   The ability to plan their own work, be self-directed, and use interpersonal skills and attitudes to work collaboratively

5. Professionalism and social responsibility
   The capacity and intention to use professional knowledge and skills ethically and responsibly, for the benefit of others and the environment

Personal attributes

Individuals entering our programs bring with them a diversity of attributes and experiences. As students of the University they will develop the qualities of critical thinking, curiosity and reflective practice. They will use foresight, initiative and leadership, and be open to alternative perspectives. As graduates, they will continue to learn and thrive in environments of complexity, ambiguity and change.

Generic skills that are emphasised in this unit are referred to in the assessment overview (5a).

2c Prerequisites and/or co-requisites

Familiarity with mathematics to Year-12 level.
3: Delivery of Unit and Timetable

3a Delivery mode

Three one-hour lectures and one one-hour tutorial/laboratory per week. The unit is co-taught with Introduction to Statistics G (6554).

On-line self-paced learning and assessment for basic Mathematical skills as required by this Unit. Time spent depends on entry level of mathematical expertise.

3b Timetable of activities, such as lectures/ tutorials/ practicals/ field classes, showing key dates and topics (Information might be provided in the form of a table)

<table>
<thead>
<tr>
<th>Week beginning</th>
<th>Week number</th>
<th>Activity. Minor variations to the sequence of activities may occur.</th>
</tr>
</thead>
<tbody>
<tr>
<td>17 Feb</td>
<td>1</td>
<td>Picturing distributions with graphs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diagnostic Evaluation of Entry Level Mathematics – Pearson’s Site</td>
</tr>
<tr>
<td></td>
<td></td>
<td>available via Unit Moodle site.</td>
</tr>
<tr>
<td>24 Feb</td>
<td>2</td>
<td>Picturing distributions with numbers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The normal distribution</td>
</tr>
<tr>
<td>3 Mar</td>
<td>3</td>
<td>Scatterplots and correlation</td>
</tr>
<tr>
<td>10 Mar</td>
<td>4</td>
<td>Regression</td>
</tr>
<tr>
<td>17 Mar</td>
<td>5</td>
<td>Test 1 on Friday 21 March (assessing material from weeks 1 – 4)</td>
</tr>
<tr>
<td>24 Mar</td>
<td>6</td>
<td>Producing data: sampling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Producing data: experiments</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Undertake the Mathematics Mastery Completion test (self test - online)</td>
</tr>
<tr>
<td>31 Mar</td>
<td>7</td>
<td>Sampling distributions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Introduction to inference</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Undertake the Mathematics Verification Test (invigilated/supervised)</td>
</tr>
<tr>
<td>7 Apr</td>
<td>8</td>
<td>Mid-semester break - no lectures</td>
</tr>
<tr>
<td>14 Apr</td>
<td>9</td>
<td>Thinking about inference</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inference about a population mean</td>
</tr>
<tr>
<td>21 Apr</td>
<td>10</td>
<td>Two-sample problems</td>
</tr>
<tr>
<td>28 Apr</td>
<td>11</td>
<td>Anzac day: no lecture</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Test 2 on Friday 19 April (assessing material from weeks 5 – 7, 9-10)</td>
</tr>
<tr>
<td>5 May</td>
<td>12</td>
<td>Two categorical variables: the chi-square test</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inference for regression</td>
</tr>
<tr>
<td>12 May</td>
<td>13</td>
<td>One-way analysis of variance: comparing several means</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Revision</td>
</tr>
</tbody>
</table>
4: Unit Resources

4a  Lists of required texts/readings


For Unit readings and resources in the University of Canberra Library
Link to search page for Unit Readings (print materials)
Link to search page for eReserve (electronic materials)

This Unit’s Moodle site contains links to the Mathematics Pathways Module that operates via the Pearson’s MathsLab resources. Students must use this module to gain access to the learning program and tests that are an essential part of this Unit.

The Mathematics Pathways module comprises the minimum capability in entry level Mathematics required for a successful attempt at the required Mathematics intrinsic to this Unit.

4b  Materials and equipment

Scientific calculator, which can be purchased at the Union shop, electronics shops e.g. Dick Smith, or Officeworks. The Casio fx82 AU PLUS II is a good choice.

4c  Unit website

To find your unit site online, login to LearnOnline(Moodle) using your student ID.

Note that your unit site has a profiles page that displays your name and email address for the benefit of other students. If you prefer to hide your email address, click here for instructions.

5: Assessment

All staff and students are required to read the document named ‘Assessment Responsibilities’ on the following link to ensure accurate understanding of the various perspectives surrounding assessment at UC. It can alleviate many misunderstandings.
5a  Assessment overview

<table>
<thead>
<tr>
<th>Assessment item (including exams held in the exam period)</th>
<th>Due date of assignments</th>
<th>Weighting (total to equal 100%)</th>
<th>Addresses learning outcome(s)</th>
<th>Related generic skill(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test 1</td>
<td>Friday week 5</td>
<td>30%</td>
<td>1, 2, 3, 6</td>
<td>1 – 3</td>
</tr>
<tr>
<td>Test 2</td>
<td>Friday week 11</td>
<td>30%</td>
<td>1, 2, 3, 4, 6</td>
<td>1 – 3</td>
</tr>
<tr>
<td>Test 3</td>
<td>Exam period</td>
<td>30%</td>
<td>1 - 6</td>
<td>1 – 3</td>
</tr>
<tr>
<td>Mastery</td>
<td>End of week 7</td>
<td>0%</td>
<td>NA</td>
<td>1 - 3</td>
</tr>
<tr>
<td>Online quizzes</td>
<td>Every Sunday</td>
<td>10%</td>
<td>1, 6</td>
<td>1 – 3</td>
</tr>
</tbody>
</table>

Key for UC Generic Skills
1 - Communication  
2 - Analysis and Inquiry  
3 - Problem Solving  
4 - Working independently and with others  
5 - Professionalism and Social Responsibility

5b  Details of each assessment item

i. Three tests: 90%
There will be three 45-minute tests, each worth 30%, held in the lectures on the following days:
- Friday week 5
- Friday week 11
The final one will be held during the University examination period at a date to be advertised.

Students should bring their pens, rulers, calculators and student ID cards to each of these tests. No other materials are allowed. Formulae will be supplied.

Absences from any one of the three tests need to be explained. Contact the unit convenor as soon as you know you will be unable to attend any of the tests. You are required to contact the unit convenor within three days of a missed test with an acceptable explanation and supporting documents. A deferred test will be made available by arrangement, as soon as possible after the original date of the test, provided the above criteria are fulfilled.

ii. Online quizzes (10%)
Online quizzes will be made available on a weekly basis, and should be completed by 23:55 pm each Sunday. Practice questions, to be discussed during the tutorial/laboratory, will also be issued on a weekly basis.

iii. Mathematics mastery
The following criterion must also be satisfied to pass this unit:
- Students must achieve at least 80% in the Mathematics Pathways module (i.e. the Mastery Completion test) to meet the pass requirements in this Unit.
- Students may undertake the Mathematics Mastery Completion test any number of times to achieve Mathematical Pathways mastery. (Different values within the problems are generated each time you undertake the test.)
- Students must sit for the supervised Mathematics Verification test – which is a smaller version of the Mathematics Mastery Completion test.
- Students for whom the Mathematics Verification test and Mathematics Mastery Completion test do not correlate will meet with their Unit convenor to establish academic integrity.
Your grade will be determined on the basis of a composite score obtained by using the weightings shown above. This composite score will then be scaled to a numerical grade consistent with the descriptors:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Numerical Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pass (P)</td>
<td>50-64</td>
</tr>
<tr>
<td>Credit (CR)</td>
<td>65-74</td>
</tr>
<tr>
<td>Distinction (DI)</td>
<td>75-84</td>
</tr>
<tr>
<td>High Distinction (HD)</td>
<td>85-100</td>
</tr>
</tbody>
</table>

It is expected that test marks and brief written comments will be returned to students within about two weeks of each test.

5c Submission of assessment items
All assessment items will be submitted online via the unit Moodle site. The first page of each assessment submission should include the following information:

Student Name:
Student ID:
Assessment Name:
Date of Submission:
Word Count (if applicable):

Late submission of assignments

Late submission of assignments without an approved extension will result in the assignment not being marked and zero being recorded for that particular assignment.

In extenuating circumstances a late submission may be considered upon the production of supporting documentation and at the discretion of the unit convener.

Extensions: Extensions must be applied for before the due date.

Students can apply for an extension to the due date for submission of an assessment item on the grounds of illness or other unavoidable and verifiable personal circumstances. Documentary evidence will be expected in order that an extension be granted.

It should be noted that such documentation will be considered but will not guarantee that the application will be successful. The Unit Convenor will decide whether to grant an extension and the length of the extension.

Responsibility for understanding

If there is any doubt with regard to the requirements of any particular assignments or assessment procedure, the onus for clarifying the issue rests with the student who should contact the unit convenor or tutor. Further, it is the responsibility of students to ensure that they are correctly enrolled in the unit and that the tutor and Student Administration have their correct contact details.

In order to be eligible for a deferred exam, students must contact the Exams Office within 3 days of the scheduled exam time to request a deferred exam.
5d **Special assessment requirements**

Normally an aggregate mark of 50% is required to pass the unit.

5e **Supplementary assessment**

Supplementary assessment will usually only be offered to students who have failed a single unit in their final semester with a final mark between 45-49%. (The unit must be required for course completion.) Refer to the UC SUPPLEMENTARY ASSESSMENT POLICY.

5f **Academic Integrity**

Students have a responsibility to uphold University standards on ethical scholarship. Good scholarship involves building on the work of others and use of others’ work must be acknowledged with proper attribution made. Cheating, plagiarism, and falsification of data are dishonest practices that contravene academic values. Please see UC’s Academic Integrity Policy.

To enhance understanding of academic integrity, it is expected that all students will complete the LearnOnline Academic Integrity Module (AIM) at least once during their course of study. The module is automatically available as a listed site when students log into LearnOnline.

5g **Use of text-matching software**

The University of Canberra has available, through LearnOnline (Moodle), text-matching software that helps students and staff reduce plagiarism and improve understandings of academic integrity. Known as URKUND, the software matches submitted text in student assignments against material from various sources: the internet, published books and journals, and previously submitted student texts. Click here for further information on the URKUND text-matching software.

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6: **Student Responsibility**

6a **Workload**

The amount of time you will need to spend on study in this unit will depend on a number of factors including your prior knowledge, learning skill level and learning style. Nevertheless, in planning your time commitments you should note that for a 3cp unit the total notional workload over the semester or term is assumed to be 150 hours. These hours include time spent in classes. The total workload for units of different credit point value should vary proportionally. For example, for a 6cp unit the total notional workload over a semester or term is assumed to be 300 hours.

Students are expected to complete the Mathematics Pathways module in their own time via the provided links within the Moodle site. Students are required to undertake the various included self-tests, but importantly to undertake the Mathematics Mastery Completion Test in their own time by the end of week 6. The results of this test will be forwarded to Unit convenors.

During week 7 students will undertake a Mathematics Verification test that will be invigilated (supervised). The results of this test will be compared with the Mathematics Mastery Completion test.

Students will need access to the internet via a standard notebook or desktop computer to work online with the Pearson’s Mathematics Pathways module. Students with an Apple iPad or Android tablet may access the module only if they use the Puffin Web Browser. Please consult your tutor for further details.

6b **Accessibility Unit**

Students who need assistance in undertaking the unit because of disability or other circumstances should inform their Unit Convener or UC AccessAbility as soon as possible so the necessary arrangements can be made.
6c **Participation requirements**
Your participation in both class and online activities will enhance your understanding of the unit content and therefore the quality of your assessment responses. Lack of participation may result in your inability to satisfactorily pass assessment items.

6d **Withdrawal**
If you are planning to withdraw please discuss with your unit convenor. Please see Withdrawal of Units for further information on deadlines.

6e **Required IT skills**
Some familiarity with basic computer use is assumed.

6f **In-Unit Costs**
Purchase of the textbook and some printing costs are possible. You will be expected to have or to purchase a basic scientific calculator.

(Note: To calculate your unit fees see: How do I calculate my fees? The online UC Co-op Textbook Search is available for purchasing text books.)

6g **Work placements, internships or practicums**
Not applicable.

6h **Additional information**
In all cases of absence, sickness or personal problems it is the student’s responsibility to ensure that the unit convener is informed. The minimum participation requirement must be met in order to pass the unit (regardless of supporting documentation).

7: **Student Feedback**

All students enrolled in this unit will have an opportunity to provide anonymous feedback on the unit at the end of the Semester via the Unit Satisfaction Survey (USS) which you can access by logging into MyUC via the UC homepage: http://www.canberra.edu.au/home/. Your lecturer or tutor may also invite you to provide more detailed feedback on their teaching through an anonymous questionnaire.

In the light of feedback from previous student surveys, assessment has been modularised to allow students to concentrate on smaller portions of the unit at a time. A Mastery program in mathematics has also been put in place to make the mathematical skills required for University study more transparent.

8: **Authority of this Unit Outline**

Any change to the information contained in Section 2 (Academic content), and Section 5 (Assessment) of this document, will only be made by the Unit Convener if the written agreement of Head of Discipline and a majority of students has been obtained; and if written advice of the change is then provided on the unit site in the learning management system. If this is not possible, written advice of the change must be then forwarded to each student enrolled in the unit at their registered term address. Any individual student who believes him/herself to be disadvantaged by a change is encouraged to discuss the matter with the Unit Convener.