Course Outline

Code: TPP105
Title: Statistics

School: Tertiary Access
Teaching Session: Semester 2
Year: 2019
Course Coordinator: Nicole McMullen  Email: Nmcmulle@usc.edu.au
Course Moderator: Kerry Rutter

Please go to the USC website for up to date information on the teaching sessions and campuses where this course is usually offered.

1. What is this course about?

1.1 Description
This course is designed to introduce you to basic statistical skills for entry to academic programs at the University. You will gain an understanding of the research process. The ability to apply statistical concepts is an essential skill for all undergraduates regardless of discipline. This course consists of a weekly lecture where you will be presented with theoretical knowledge. This will be followed by a weekly tutorial, where the theoretical concepts are illustrated, reaffirmed and complemented with practical exercises.

1.2 Course topics
- Statistical definitions
- Basic experimental design
- Sampling strategies
- Data summaries using tables and figures
- Data distributions
- The normal distribution and Z scores
- An introduction to testing hypotheses
- t Tests

2. What level is this course?
100 level Introductory - Discipline knowledge and skills at foundational level, broad application of knowledge and skills in familiar contexts and with support. Normally associated with the first full-time year of an undergraduate program

3. What is the unit value of this course?
12 units
Please be aware units from this course cannot be counted for credit towards an award-bearing program.
4. **How does this course contribute to my learning?**

<table>
<thead>
<tr>
<th>Specific Learning Outcomes</th>
<th>Assessment tasks</th>
<th>Graduate Qualities or Professional Standards mapping</th>
</tr>
</thead>
<tbody>
<tr>
<td>On successful completion of this course, you should be able to:</td>
<td>You will be assessed on the learning outcomes in task/s:</td>
<td>Completing these tasks successfully will contribute to you becoming:</td>
</tr>
<tr>
<td>Demonstrate and apply basic knowledge of statistics to simple contexts with extensive support and practice.</td>
<td>Task 1: Statistics assignment Task 2: Mid semester exam Task 3: Final exam</td>
<td>Empowered.</td>
</tr>
<tr>
<td>Develop and interpret tabular data and present them in scientifically valid graphical forms.</td>
<td>Task 1: Statistics assignment Task 2: Mid semester exam Task 3: Final exam</td>
<td>Knowledgeable.</td>
</tr>
<tr>
<td>Analyse data using descriptive and inferential statistical techniques (i) from first principles using formulae and (ii) using a scientific calculator and statistics software to: • calculate measures of central tendency and variability • test hypotheses based on given research questions</td>
<td>Task 1: Statistics assignment Task 2: Mid semester exam Task 3: Final exam</td>
<td>Knowledgeable</td>
</tr>
<tr>
<td>Troubleshoot statistical and experimental errors and identify implausible results</td>
<td>Task 1: Statistics assignment Task 2: Mid semester exam Task 3: Final exam</td>
<td>Creative and critical thinkers.</td>
</tr>
</tbody>
</table>

5. **Am I eligible to enrol in this course?**
Refer to the [USC Glossary of terms](#) for definitions of “pre-requisites, co-requisites and anti-requisites”.

5.1 **Enrolment restrictions**
Students must be enrolled in TP000 or XE001

5.2 **Pre-requisites**
Nil

5.3 **Co-requisites**
Nil

5.4 **Anti-requisites**
Nil

5.5 **Specific assumed prior knowledge and skills (where applicable)**
Nil
6. **How am I going to be assessed?**

6.1 **Grading scale**

Standard – High Distinction (HD), Distinction (DN), Credit (CR), Pass (PS), Fail (FL)

6.2 **Details of early feedback on progress**

In Week 3 a draft copy of question 2 from Task 1 will be peer reviewed in class and time allocated within computer tutorial scheduled in Week 3 and 4 to work on Excel and SPSS problem from Task 1.

6.3 **Assessment tasks**

<table>
<thead>
<tr>
<th>Task No.</th>
<th>Assessment Tasks</th>
<th>Individual or Group</th>
<th>Weighting %</th>
<th>What is the duration / length?</th>
<th>When should I submit?</th>
<th>Where should I submit it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Assignment</td>
<td>Individual</td>
<td>30%</td>
<td>500 words</td>
<td>Friday of week 5</td>
<td>Blackboard</td>
</tr>
<tr>
<td>2</td>
<td>Mid semester exam</td>
<td>Individual</td>
<td>30%</td>
<td>2 hours</td>
<td>Week 7 tutorial</td>
<td>To tutor</td>
</tr>
<tr>
<td>3</td>
<td>Final exam</td>
<td>Individual</td>
<td>40%</td>
<td>2 hours</td>
<td>Week 13 tutorial</td>
<td>To tutor</td>
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</table>

**Assessment Task 1: Statistics assignment**

**Goal:** To assess knowledge gleaned from the first 4 weeks of the course: the language of statistics, basic research design, sampling strategies and the presentation of descriptive statistics.

**Product:** This task comprises the solutions to a series of problems from the material of Weeks 1 to 4 that you submit for marking at the end of Week 5. Weekly feedback from Weeks 1 to 4 will contribute to this learning.

**Format:** Handwritten and word-processed hardcopy with cover sheet.

**Criteria:** Marks are awarded for

(i) clarity of thinking through development of problem solutions
(ii) accuracy of outcomes through appropriate use of tables and figures
(iii) demonstrated understanding of statistical language
(iv) clarity in communicating the ideas underpinning a problem solution, including correct use of statistical symbols and conventions

**Assessment Task 2: Mid semester exam**

**Goal:** To assess knowledge gleaned from the first 6 weeks of the course: the language of statistics, basic research design, sampling strategies, measures of central tendency and variability, analysing data and using a scientific calculator and the presentation of descriptive statistics

**Product:** This task comprises the solutions to a series of problems from the material of Weeks 1 to 6 that you submit for marking at the end of Week 7.

**Format:** Solution attempts made on the examination paper.

**Criteria:** Marks are awarded for

(i) clarity of thinking through development of problem solutions
(ii) accuracy of outcomes through appropriate use of tables and figures
(iii) demonstrated understanding of statistical language
(iv) clarity in communicating the ideas underpinning a problem solution, including correct use of statistical symbols and conventions
Assessment Task 3: Final exam

<table>
<thead>
<tr>
<th>Goal:</th>
<th>To assess knowledge gleaned from the entire 12 weeks of the course; the language of statistics, basic research design, sampling strategies, measures of central tendency and variability, analysing data and using a scientific calculator, the presentation of descriptive statistics, data distributions, z scores, and hypothesis testing, specifically using t tests.</th>
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<tbody>
<tr>
<td>Product:</td>
<td>This task comprises the solutions to a series of problems from the material of Weeks 1 to 12 that you submit for marking at the end of Week 13.</td>
</tr>
<tr>
<td>Format:</td>
<td>Solution attempts made on the examination paper</td>
</tr>
</tbody>
</table>
| Criteria: | Marks are awarded for  
(i) clarity of thinking through development of problem solutions  
(ii) accuracy of outcomes through appropriate use of tables and figures  
(iii) demonstrated understanding of statistical language  
(iv) demonstrated understanding and application of hypothesis testing.  
(v) clarity in communicating the ideas underpinning a problem solution, including correct use of statistical symbols and conventions. |

7. What are the course activities?

7.1 Directed study hours
The directed study hours listed here are a portion of the workload for this course. A 12-unit course will have total of 150 learning hours which will include directed study hours (including online if required), self-directed learning and completion of assessable tasks. Directed study hours may vary by location. Student workload is calculated at 12.5 learning hours per one unit.

<table>
<thead>
<tr>
<th>Location:</th>
<th>Directed study hours for location:</th>
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</table>
| Sippy Downs        | Lecture: 1 x 1-hour per week for 13 weeks  
                        Tutorial: 1 x 2-hour per week for 13 weeks |
| USC Fraser Coast   | Lecture: 1 x 1-hour per week for 13 weeks  
                        Tutorial: 1 x 2-hour per week for 13 weeks |

7.2 Course content

<table>
<thead>
<tr>
<th>Week #</th>
<th>What key concepts/content will I learn?</th>
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</table>
| 1      | Basic concepts/Numeracy  
                        • Why do statistics  
                        • Limitations/variability  
                        • Calculator skills  
                        • Measurement scales |
| 2      | Introduction to statistics  
                        • Sampling concepts  
                        • Randomisation  
                        • Experimental Design |
| 3      | Processing descriptive data  
                        • Collating / presenting descriptive data  
                        • Summarising descriptive data  
                        • Condensing, or grouping descriptive data;  
                        • Presenting descriptive data in an appropriate graphical form |
| 4      | Descriptive Statistics: Central Tendency  
                        • Define and calculate commonly used measures of central tendency. |
### Course Outline: TPP105  Statistics

<table>
<thead>
<tr>
<th>5</th>
<th>Descriptive Statistics: Variability</th>
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<tbody>
<tr>
<td>• State the advantages and disadvantages of each measure of central tendency.</td>
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<tr>
<td>• Use the correct measure of central tendency in a practical scenario.</td>
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<thead>
<tr>
<th>6</th>
<th>Skewed Data</th>
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<tr>
<td>• Understand and describe ‘skewness’</td>
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<tr>
<td>• Calculate the median and quartiles for a dataset.</td>
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<tr>
<td>• Calculate the 5-number summary of a dataset.</td>
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<tr>
<td>• Calculate the interquartile range.</td>
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<tr>
<td>• Draw a box and whisker plot.</td>
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<tr>
<td>• Identify the correct measure of central tendency</td>
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</table>

| 7 | Course Revision and Task 2 exam |

<table>
<thead>
<tr>
<th>8</th>
<th>The Normal Distribution and Z Scores</th>
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<tbody>
<tr>
<td>• Describe the characteristics of a normal distribution, including the empirical rule.</td>
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<tr>
<td>• Define, calculate and interpret Z scores</td>
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<tr>
<th>9</th>
<th>Probability</th>
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<tr>
<td>• State the basic definitions related to probability theory.</td>
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<tr>
<td>• Calculate the probability of a single event.</td>
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<tr>
<td>• Calculate the probability of compound events</td>
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</table>

<table>
<thead>
<tr>
<th>10</th>
<th>Sample Analysis and the Confidence Interval</th>
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</thead>
<tbody>
<tr>
<td>• Understand the difference between analysis of a population and analysis of a sample.</td>
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<tr>
<td>• Know what is meant by the term ‘confidence interval’</td>
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<tr>
<td>• Calculate a confidence interval</td>
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<tr>
<td>• Define the terms ‘degrees of freedom’ and ‘standard error’.</td>
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<tr>
<td>• Introduce the ‘t distribution’</td>
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<thead>
<tr>
<th>11</th>
<th>Hypothesis Testing and t-tests</th>
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<tbody>
<tr>
<td>• Understand the approach to research using hypothesis testing.</td>
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<tr>
<td>• Be able to, state the null and alternate hypotheses for a given scenario.</td>
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<tr>
<td>• Describe the difference between a one and two tailed hypothesis.</td>
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<tr>
<td>• Perform an hypothesis test for comparing the mean of 2 sample datasets (t test)</td>
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<tr>
<td>• Examines the 3 different types of t test</td>
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<tr>
<td>• Recognise and apply the appropriate t test based on the available information</td>
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<tr>
<td>• Perform a hypothesis test on a dataset using the t test.</td>
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</tbody>
</table>

| 12 | Course revision |

| 13 | Exam |

Please note that the course activities may be subject to variation.

### 8. What resources do I need to undertake this course?

Please note that course information, including specific information of recommended readings, learning activities, resources, weekly readings, etc. are available on the course Blackboard site. Please log in as soon as possible.

**8.1 Prescribed text(s)**

No commercial textbook but your readings are in TPP105 Course Reader available on Blackboard and hard copy through MaPs. This will be used in open book examinations.
8.2 Specific requirements
Scientific calculator also required. You will not require a graphics nor programmable calculator for this course unless you already own one.

9. Risk management
Health and safety risks for this course have been assessed as low.

It is your responsibility as a student to review course material, search online, discuss with lecturers and peers, and understand the health and safety risks associated with your specific course of study. It is also your responsibility to familiarise yourself with the University’s general health and safety principles by reviewing the online Health Safety and Wellbeing training module for students, and following the instructions of the University staff.

10. What administrative information is relevant to this course?

10.1 Assessment: Academic Integrity
Academic integrity is the ethical standard of university participation. It ensures that students graduate as a result of proving they are competent in their discipline. This is integral in maintaining the value of academic qualifications. Each industry has expectations and standards of the skills and knowledge within that discipline and these are reflected in assessment.

Academic integrity means that you do not engage in any activity that is considered to be academic fraud; including plagiarism, collusion or outsourcing any part of any assessment item to any other person. You are expected to be honest and ethical by completing all work yourself and indicating in your work which ideas and information were developed by you and which were taken from others. You cannot provide your assessment work to others. You are also expected to provide evidence of wide and critical reading, usually by using appropriate academic references.

In order to minimise incidents of academic fraud, this course may require that some of its assessment tasks, when submitted to Blackboard, are electronically checked through SafeAssign. This software allows for text comparisons to be made between your submitted assessment item and all other work that SafeAssign has access to.

10.2 Assessment: Additional requirements
Eligibility for Supplementary Assessment
Your eligibility for supplementary assessment in a course is dependent of the following conditions applying:

a) The final mark is in the percentage range 47% to 49.4%
b) The course is graded using the Standard Grading scale
c) You have not failed an assessment task in the course due to academic misconduct

10.3 Assessment: Submission penalties
Late submission of assessment tasks will be penalised at the following maximum rate:

- 5% (of the assessment task’s identified value) per day for the first two days from the date identified as the due date for the assessment task.
- 10% (of the assessment task’s identified value) for the third day
- 20% (of the assessment task’s identified value) for the fourth day and subsequent days up to and including seven days from the date identified as the due date for the assessment task.
- A result of zero is awarded for an assessment task submitted after seven days from the date identified as the due date for the assessment task.

Weekdays and weekends are included in the calculation of days late. To request an extension, you must contact your Course Coordinator and supply the required documentation to negotiate an outcome.
10.4 Study help
In the first instance, you should contact your tutor, then the Course Coordinator. Additional assistance is provided to all students through Academic Skills Advisers. To book an appointment or find a drop-in session go to Student Hub.
Contact Student Central for further assistance: +61 7 5430 2890 or studentcentral@usc.edu.au

10.5 Links to relevant University policy and procedures
For more information on Academic Learning & Teaching categories including:
- Assessment: Courses and Coursework Programs
- Review of Assessment and Final Grades
- Supplementary Assessment
- Administration of Central Examinations
- Deferred Examinations
- Student Academic Misconduct
- Students with a Disability

Visit the USC website:
http://www.usc.edu.au/explore/policies-and-procedures#academic-learning-and-teaching

10.6 General Enquiries
In person:
- USC Sunshine Coast - Student Central, Ground Floor, Building C, 90 Sippy Downs Drive, Sippy Downs
- USC South Bank - Student Central, Building A4 (SW1), 52 Merivale Street, South Brisbane
- USC Gympie - Student Central, 71 Cartwright Road, Gympie
- USC Fraser Coast - Student Central, Student Central, Building A, 161 Old Maryborough Rd, Hervey Bay
- USC Caboolture - Student Central, Level 1 Building J, Cnr Manley and Tallon Street, Caboolture
Tel: +61 7 5430 2890
Email: studentcentral@usc.edu.au