PSYC2012 – Statistics & Research Methods for Psychology

Unit of Study Code: PSYC2012

Coordinator: Dr Rebecca Pinkus
Office: Room 444 Brennan MacCallum Building
Phone: 8627 4641
E-mail: rebecca.pinkus@sydney.edu.au
(Please put “PSYC2012” in the subject line of your emails)

Other lecturing staff: Dr Steson Lo
Office: Room 530 Griffith Taylor Building
Phone: 9036 9325
E-mail: steson.lo@sydney.edu.au
(Please put “PSYC2012” in the subject line of your emails)

Format of Unit:
2 x 1 hour lectures/week x 13 weeks
1 x 2 hour tutorial/week x 12 weeks
*Tutorials commence in Week 2*

Tutorial sizes: maximum of 23 students per tutorial

Credit Point Value: 6 Credit Points

Time Commitment: 4 hours face to face per week; 8 hours private study per week (including 2 hours of preparation for each tutorial)

Lecture attendance: Required. 80% recommended to pass unit. Audio recordings made of most lecture content and most slides posted online.

Tutorial attendance: Required. 80% recommended to pass unit. Attendance recorded. Attend your timetabled tutorial.

Prerequisites: 12 credit points of First Year Psychology (PSYC1001 and PSYC1002)
### PSYC2012 Assessment Summary

<table>
<thead>
<tr>
<th>Assessment Name</th>
<th>Assessment Category</th>
<th>Assessment Type (When applying for Special Consideration)</th>
<th>% Assessment Weighting</th>
<th>Duration of Assessment</th>
<th>Available / Due Date</th>
<th>Feedback/Return of Marks Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tutorial Test 1 (open book; short answer)</td>
<td>In-class assessment</td>
<td>Tutorial quiz</td>
<td>5%</td>
<td>12 minutes working (no reading time)</td>
<td>During your timetabled tutorial in Week 4 (27th-30th March)</td>
<td>Marks will be returned by the end of Week 6</td>
</tr>
<tr>
<td>Tutorial Test 2 (open book; short answer)</td>
<td>In-class assessment</td>
<td>Tutorial quiz</td>
<td>15%</td>
<td>15 minutes working (+ 2 mins reading time)</td>
<td>During your timetabled tutorial in Week 8 (1st – 4th May)</td>
<td>Marks will be returned by the end of Week 10</td>
</tr>
<tr>
<td>Mid-semester Exam (closed book; computerised multiple-choice questions)</td>
<td>In-class assessment</td>
<td>Small test</td>
<td>25%</td>
<td>45 minutes (no reading time)</td>
<td>During your timetabled tutorial in Week 10 (15th – 18th May)</td>
<td>Week 10 (upon completion of the exam)</td>
</tr>
<tr>
<td>Tutorial Test 3 (open book; short answer)</td>
<td>In-class assessment</td>
<td>Tutorial quiz</td>
<td>15%</td>
<td>15 minutes working (+ 2 mins reading time)</td>
<td>During your timetabled tutorial in Week 12 (29th May – 1st June)</td>
<td>Marks will be returned during STUVAC</td>
</tr>
<tr>
<td>Final Exam (closed book; multiple choice questions)</td>
<td>Exam</td>
<td>Final Exam</td>
<td>40%</td>
<td>120 minutes (+ 10 mins reading time)</td>
<td>During University exam period (19th June – 1st July)</td>
<td>University Final Results Release Date</td>
</tr>
</tbody>
</table>

**TOTAL** 100%

All assessments in PSYC2012 must be completed individually. No assessments involve group work.

*Completion of these assessments is compulsory to pass this unit. Students who fail to complete any of these compulsory components will receive an Absent Fail grade, regardless of their marks in other assessments.*

**The replacement exams consist of a mix of multiple-choice questions, fill-in-the-blank questions, and short answer questions.

**Disruptions to your study**

If your assessments are disrupted by illness or misadventure or unavoidable community commitments, apply for Special Consideration or Special Arrangements online here: [http://sydney.edu.au/current_students/special_consideration/index.shtml](http://sydney.edu.au/current_students/special_consideration/index.shtml)

Please note: If you are ill and miss a tutorial, contact the tutor of another tutorial and request permission to attend that person’s tutorial time for that week; do NOT use the online special consideration form for missed tutorials unless the missed tutorial contains a Tutorial Test or Mid-semester Exam. If in doubt, please contact Steson ([steson.lo@sydney.edu.au](mailto:steson.lo@sydney.edu.au)).
Note that students who apply for and are granted either special arrangements or special consideration for final examinations in units offered by the Faculty of Science will be expected to sit any replacement assessments in Week 18. Later dates for replacement assessments may be considered where the application is supported by appropriate documentation and provided that adequate resources are available to accommodate any later date.

If you have (or develop) a continuing issue, register with Disability Services here: [www.sydney.edu.au/disability](http://www.sydney.edu.au/disability)

In PSYC2012 no minimum mark for any assessment automatically results in a fail for the overall unit of study. If your marks for all assessment tasks together add up to 50 or more, you will pass the unit.

**Special Consideration**

*If you fall ill or suffer a misadventure before an assessment, do not sit the assessment and apply for Special Consideration instead.* A successful Special Consideration application for Tutorial Test 1 will result in a marks adjustment such that each of the other two Tutorial tests will be weighted at 17.5% instead of 15%. A successful Special Consideration application for Tutorial Test 2, Tutorial Test 3, or the Mid-semester Exam will result in a varied assessment to be completed the Friday of the week after the initial assessment (i.e., Friday 12th May in Week 9 for Tutorial Test 2; Friday 9th June in Week 13 for Tutorial Test 3; Friday 26th May in Week 11 for the Mid-semester Exam).

**Replacement Assessments**

If you still have not completed the Mid-semester Exam by Friday 26th May, you must complete an alternate assessment. The alternate assessment will be held during STUVAC (date and time to be confirmed). Marks are usually not awarded for the alternate assessment; it is intended for students who did not attempt the assessment. The Mid-semester exam is a compulsory assessment, which is why a serious attempt is required to be eligible to receive any mark other than an AF (Absent Fail).

**Academic Honesty**

While the University is aware that the vast majority of students and staff act ethically and honestly, it is opposed to and will not tolerate academic dishonesty or plagiarism and will treat all allegations of dishonesty seriously.

All students are expected to be familiar and act in compliance with the relevant University policies, procedures and codes, which include:

- [Academic Honesty in Coursework Policy 2015](http://sydney.edu.au/policies)
- [Academic Honesty Procedures 2016](http://sydney.edu.au/policies)
- [Code of Conduct for Students](http://sydney.edu.au/policies)
- [Research Code of Conduct 2013](http://sydney.edu.au/policies) (for honours and postgraduate dissertation units)

They can be accessed via the University’s Policy Register: [http://sydney.edu.au/policies](http://sydney.edu.au/policies) (enter “Academic Honesty” in the search field).

Students should never use document-sharing sites and should be extremely wary of using online “tutor” services. Further information on academic honesty and the resources available to all students can be found on the Academic Integrity page of the University website: [http://sydney.edu.au/elearning/student/EI/index.shtml](http://sydney.edu.au/elearning/student/EI/index.shtml)
Academic Dishonesty and Plagiarism

**Academic dishonesty involves seeking unfair academic advantage or helping another student to do so.**

You may be found to have engaged in academic dishonesty if you:
- Resubmit (or “recycle”) work that you have already submitted for assessment in the same unit or in a different unit or previous attempt;
- Use assignment answers hosted on the internet, including those uploaded to document sharing websites by other students.
- Have someone else complete part or all of an assignment for you, or do this for another student.
- Except for legitimate group work purposes, providing assignment questions and answers to other students directly or through social media platforms or document (“notes”) sharing websites, including essays and written reports.
- Engage in examination misconduct, including using cheat notes or unapproved electronic devices (e.g., smartphones), copying from other students, discussing an exam with another person while it is in progress, or removing confidential examination papers from the examination venue.
- Engage in dishonest plagiarism.

**Plagiarism means presenting another person’s work as if it is your own without properly or adequately referencing the original source of the work.**

Plagiarism is using someone else’s ideas, words, formulas, methods, evidence, programming code, images, artworks, or musical creations without proper acknowledgement. If you use someone’s actual words you must use quotation marks as well as an appropriate reference. If you use someone’s ideas, formulas, methods, evidence, tables or images you must use a reference. You must not present someone’s artistic work, musical creation, programming code or any other form of intellectual property as your own. If referring to any of these, you must always present them as the work of their creator and reference in an appropriate way.

Plagiarism is always unacceptable, regardless of whether it is done intentionally or not. It is considered dishonest if done knowingly, with intent to deceive or if a reasonable person can see that the assignment contains more work copied from other sources than the student’s original work. The University understands that not all plagiarism is dishonest and provides students with opportunities to improve their academic writing, including their understanding of scholarly citation and referencing practices.

**Use of similarity detection software**

All written assignments submitted in this unit of study will be submitted to the similarity detecting software program known as Turnitin. Turnitin searches for matches between text in your written assessment task and text sourced from the Internet, published works and assignments that have previously been submitted to Turnitin for analysis.

There will always be some degree of text-matching when using Turnitin. Text-matching may occur in use of direct quotations, technical terms and phrases, or the listing of bibliographic material. This does not mean you will automatically be accused of academic dishonesty or plagiarism, although Turnitin reports may be used as evidence in academic dishonesty and plagiarism decision-making processes.

**Changes made to this unit in response to student feedback**

Lectures have been streamlined to occur twice a week every week, with the research methods content embedded within these lectures. The lecture content for each statistical test will now include effect size. The timing of in-class tests has also been changed in response to previous student feedback.

**Unit of Study General Description**

In this unit of study you will be introduced to some of the basic concepts of statistics and statistical inference as well as research design, as applied in psychological research. The aim of the course is to develop your ability to understand the published research literature, to design and plan research questions with a clear idea of how to test the questions of interest, and to become critical consumers of any sort of statistical information. You will also be introduced to the computer package SPSS, which is a widely used program for statistical analysis. There are regular assessments throughout the course, which are intended to give you ongoing feedback about your progress over the course of the unit. This course is structured around the graduate qualities associated with the scientist-practitioner model, the basis for the training of psychologists in Australia and internationally.
Learning Outcomes and Graduate Qualities

The following student learning outcomes and their associated graduate qualities will be developed through lectures, tutorials and assessment activities in particular. The assessments target all the elements of the qualities.

1: Depth of Disciplinary Expertise
By the end of this Statistics and Research Methods in Psychology unit of study, you will have a strong understanding of introductory statistics relevant to Psychology, and you will be able to apply introductory statistics within Psychology. Specifically, you will be able to:
- calculate and interpret descriptive statistics such as measures of central tendency and variability
- demonstrate understanding of graphical and tabular representations of data, and be able to use statistical tables
- conduct significance tests for statistical hypotheses relevant to Psychology
- compute and interpret confidence intervals and other effect size indices
- understand the limitations of, and possibility of errors in, statistical inference
- carry out appropriate statistical tests on computer using SPSS and interpret the output accordingly

You will also have a moderate degree of understanding the basic research methods in Psychology. Specifically, you will be able to:
- describe the basic characteristics of the science of Psychology
- describe, apply, and evaluate the different research methods used by psychologists
- demonstrate practical skills in laboratory-based and other psychological research

2: Broader Skills
By the end of this Statistics and Research Methods in Psychology unit of study, you will have improved your critical thinking skills. You will be able to apply knowledge of the scientific method in thinking about problems related to Psychology. Specifically, you will be able to:
- question claims that arise from myths, stereotypes, pseudoscience or untested assumptions by emphasising tools to test such assumptions (not assessed)
- recognise and defend against the major fallacies of human thinking such as graphical misrepresentations and overemphasis of mean compared to variance measures

3: An Integrated Professional, Ethical, and Personal Identity
By the end of this Statistics and Research Methods in Psychology unit of study, you will have been introduced to the values relating to research and professional ethics in Psychology. Specifically, you will be able to:
- use information in an ethical manner (e.g., acknowledge and respect work and intellectual property rights of others through appropriate citations in oral and written communication); understand the ethical obligations of research scientists and understand best practice in research design

SYLLABUS

Descriptive statistics: Measures of central tendency and variability. Effects of transformation on a set of scores. Finding areas under the normal curve.

Inferential statistics: Formulating hypotheses for tests of statistical significance for a single mean, using z and t-tests; for 2 related means and for 2 independent means using t-tests. Confidence intervals and power. Analysis of variance and follow-up tests for tests about means with two or more groups. Looking at relationships between two continuous variables: correlation. Factors affecting correlation. Testing correlation coefficients for statistical significance. Simple linear regression. Categorical data: tests for frequency data using the chi-square statistic. Effect size measures for different statistics.

Research methods: Understanding the problems of designing experiments to answer specific questions, and limitations in the conclusions that can be drawn.
## LECTURE AND TUTORIAL TIMETABLE

<table>
<thead>
<tr>
<th>WEEK</th>
<th>LECTURES (1 hour)</th>
<th>TUTORIALS (2 hours)</th>
<th>ASSESSMENTS</th>
</tr>
</thead>
</table>
| 1    | 1. The importance and ethics of statistics for psychological research & The Research Process  
     | 2. Variables and descriptive statistics                                          |                     |                                    |
| 6/3 – 10/3 |                                                                                   |                     |                                    |
| 2    | 3. Linear transformations, the normal distribution, standardisation, and z scores  
     | 4. Linear transformations, the normal distribution, standardisation, and z scores | 1. Descriptive statistics |                                    |
| 13/3 – 17/3 |                                                                                   |                     |                                    |
| 3    | 5. Null hypothesis significance testing                                           | 2. Linear transformations, normal distribution, z scores |                                    |
| 20/3 – 24/3 |                                                                                   |                     |                                    |
| 4    | 7. z-tests                                                                        | 3. NHST             | Tutorial Test 1 (5%)               |
| 27/3 – 31/3 | 8. z-tests                                                                       |                     | (L1-4, T1-2)                      |
| 5    | 9. t-test for a single mean                                                       | 4. z-tests          |                                    |
| 3/4 – 7/4 | 10. t-test for a single mean                                                      |                     |                                    |
| 6    | 11. Related samples t-test                                                        | 5. t-test for a single mean |                                    |
| 10/4 – 14/4 | 12. Related samples t-test                                                      |                     |                                    |
| PUBLIC HOLIDAY: Friday 14 April |                                                                                   |                     |                                    |
| 7    | 13. Independent samples t-test                                                   | 6. Related samples t-test |                                    |
| PUBLIC HOLIDAY: Tuesday 25 April |                                                                                   |                     |                                    |
| 8    | 15. One-way ANOVA                                                               | 7. Independent samples t-test | Tutorial Test 2 (15%)               |
| 1/5 – 5/5 | 16. One-way ANOVA                                                               |                     | (L5-10, T3-5)                     |
| 9    | 17. One & Two-way ANOVA                                                          | 8. One-way ANOVA    |                                    |
| 8/5 – 12/5 | 18. Two-way ANOVA                                                             |                     |                                    |
| 10   | 19. Correlation                                                                  | 9. Two-way ANOVA    | Mid-semester exam (25%)             |
| 15/5 – 19/5 | 20. Correlation                                                               |                     | (L1-12, T1-6)                     |

**Non-teaching week (17 – 21 April; no classes)**
<table>
<thead>
<tr>
<th>WEEK</th>
<th>LECTURES (1 hour)</th>
<th>TUTORIALS (2 hours)</th>
<th>ASSESSMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 (22/5 – 26/5)</td>
<td>21. Regression</td>
<td></td>
<td>10. Correlation</td>
</tr>
<tr>
<td></td>
<td>22. Regression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 (29/5 – 2/6)</td>
<td>23. Chi-Square Tests</td>
<td></td>
<td>11. Regression</td>
</tr>
<tr>
<td></td>
<td>24. Chi-Square Tests</td>
<td></td>
<td>Tutorial Test 3 (15%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(L13-18, T7-9)</td>
</tr>
<tr>
<td>13 (5/6 – 9/6)</td>
<td>25. Reliability, Validity and Replicability</td>
<td></td>
<td>12. Chi-Square &amp; Revision</td>
</tr>
<tr>
<td></td>
<td>26. Test Selection &amp; Revision</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Equipment**

Students will need a calculator, to be brought to all tutorials and assessments. The calculator should have statistical functions. The calculators used in HSC mathematics courses will be suitable. Students may also find it useful to have a USB for saving tutorial data.

**Textbook**

There is no required textbook for this unit.

Two recommended resources are the two versions of David Howell’s texts:


For those students who have done no statistics before (PSYC 1001/1002 not included) and are apprehensive, the ‘Fundamental’ book is recommended. For those who have some statistical training, the ‘Methods’ book is more advanced and a valuable reference for further study in Psychology. Earlier editions of the textbooks are suitable.

Other recommended resources:


*This text is useful for understanding statistics as well as SPSS.

For Research Methods, useful resources are:


For using SPSS, some useful resources are:


**Library Readings**

To find your recommended readings for this unit of study, look for “Unit of Study Readings” on the left menu of the eLearning site.
Software

Purchasing SPSS software is not essential for PSYC2012 (but if money is no object, it might be recommended for those wishing to continue with psychology. Note however that recent licencing arrangements for students are not generous, and from v19 only one-year licences are available). There are 2 versions that can be purchased at the Co-Op bookshop:
- the Standard Grad Pack, a fully-functioning version (23) of SPSS for Win/Mac (recommended); and
- the Base Grad Pack (formerly known as the Student version), a cut-down version (23) that is less expensive and is suitable for PSYC2012, but not for 3rd year and beyond.

Note that SPSS is available via the ICT Virtual Desktops located in the Access labs and University Libraries, and can also be accessed online through Bring Your Own Device (BYOD). SPSS is now up to version 24, but earlier versions are more than adequate. More details will be given in the first lecture and on LMS.

Note that all statistical tests introduced in PSYC2012 can be conducted using the free software R (see supplementary documents on the eLearning site).

Learning Management System (LMS) access

You are required to be given access to the eLearning site (LMS) for this Unit of Study from the beginning of the week before semester begins. This document, and in particular details about assessment due dates, weightings and closing dates, must be available on that eLearning site from that time, and changes will not be made to these details throughout semester except in exceptional circumstances.

You are expected to check LMS regularly for lecture and tutorial notes, extra practice exercises, administrative notices, and other information and resources. The LMS site for PSYC2012 features a forum that you can use to discuss course content with your peers. This forum will be monitored by the PSYC2012 teaching staff.

Data Collection

Note that your participation in this unit of study permits us to use your learning analytics to be used to improve your experience of learning.