PSYC2012 –
Statistics & Research Methods for Psychology

Unit of Study Code: PSYC2012
Coordinator: Dr Margaret Charles
Contact: Office: Room 452 Brennan building
         Phone: 9351 3354
         E-mail: margretc@psych.usyd.edu.au

Format of Unit:
2 x 1 hour lectures/week x 13 weeks (Statistics)
1 x 1 hour lecture x 6 weeks (alternate weeks: Research Methods)
1 x 1 hour tutorial/week x 12 weeks
1 x 1 hour computer tutorial x 6 weeks (alternate weeks)

Tutorial sizes: maximum of 20 students per group

You need to attend both your weekly statistics (STA) tutorial and your
fortnightly computer (COM) tutorial. You will be allocated to either
EVEN or ODD weeks for your computer tutorial by the University
Timetabling Unit. Also remember that tutorials commence in week 2,
an EVEN week.

Credit Point Value: 6 Credit Points
Prerequisite: 12 credit points of First Year Psychology including PSYC 1001 and
             PSYC 1002
Assessment:
30% Tutorial Tests
   Held in weekly tutorials in the following weeks:
   Week 4, 4 April – 8 April
   Week 8, 2 May – 6 May
   Week 12, 30 May – 3 June (each one 10% of total mark)

20% Midsemester examination (computerized, multiple choice)
   Held in weekly tutorial in Week 9, 9 May – 13 May

10% Group project, 1,000 words
   Due Day: Wednesday 15 June

5% Web-based exercises

35% Final examination (multiple choice)
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 used 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. Your introduction to the computer package SPSS is designed with the goal of making you informed users of the technology. To encourage you to maintain the required level of application, assessments will be carried out regularly.

Teaching outcomes:
Students will be expected 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 (which will be provided).
• demonstrate the ability to formulate and carry out significance tests for statistical hypotheses appropriate to a variety of research situations.
• be able to compute and interpret confidence intervals and other effect size indices.
• understand the limitations of, and possibility of errors in, statistical inference.
• critically evaluate published research.
• be able to carry out appropriate statistical tests on computer using SPSS, as taught in tutorials, and interpret the output accordingly.
• apply and synthesise the material covered in a group research project which involves the analysis, reporting and interpretation of data.

Evidence of learning:
Assessment is continuous and varied to enable students to demonstrate their understanding of all aspects of the unit of study.
Written assessments will be open book and will test the student's ability to carry out various procedures and to report the results appropriately. The subject matter of each of the 3 written tests, as detailed under Assessments (above), will be specified in lectures.
The group project is to encourage the ability to work in groups and pool knowledge and abilities to produce a superior report of research and analysis.
The web-based exercises will require students to complete on-line exercises to a satisfactory level of performance.
The examinations (midsemester and final) are closed book, and consist of multiple choice questions. The midsemester examination is computerised and is held in tutorials, the end of semester examination is held under normal examination conditions.

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. Analysis of variance and follow-up tests for tests about means with 2 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.
Research methods: understanding the problems of designing experiments to answer specific questions, and limitations in the conclusions that can be drawn.
TIMETABLE

<table>
<thead>
<tr>
<th>WEEK</th>
<th>STATISTICS LECTURES</th>
<th>RESEARCH METHODS LECTURES</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Descriptive statistics: central tendency and variability</td>
<td>No lecture</td>
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<tr>
<td>2</td>
<td>Standard deviation, z scores, normal distribution</td>
<td>Variables and Relationships</td>
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<tr>
<td>3</td>
<td>Hypothesis testing; sampling distribution of the mean</td>
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<tr>
<td>4</td>
<td>Hypothesis testing: t test for a single mean</td>
<td>Artifacts and bias in behavioural research</td>
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<tr>
<td>5</td>
<td>Parameter estimation; statistical power</td>
<td>Research Designs</td>
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<td>6</td>
<td>t-tests for related and independent samples</td>
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<td>7</td>
<td>Analysis of variance - one-way</td>
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<tr>
<td>8</td>
<td>Analysis of variance - two way</td>
<td>Internal and External Experimental Validity</td>
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<td>9</td>
<td>Correlation</td>
<td>Controlling Extraneous Variables</td>
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<td>10</td>
<td>Simple Linear Regression</td>
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<td>11</td>
<td>Chi square tests for categorical data</td>
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<td>12</td>
<td>Applications: choosing appropriate tests</td>
<td>Applications: Reading Research Critically</td>
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<td>13</td>
<td>Overview and revision</td>
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EQUIPMENT

Students will need a calculator, to be brought to all tutorials. The calculator should have statistical functions; the calculators used in secondary school mathematics courses will be quite suitable. Students will also need to purchase a CD-R (writeable CD) for saving assignment and tutorial data. Instructions will be given in the first computer tutorial, so students are strongly advised to have purchased their CD-R by that time.

TEXT

NOTE: Two versions of the Howell text are available, only one of which is needed. For those students who have done no statistics before (Psych. 1 not included) and are apprehensive, the ‘Fundamentals’ 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.

EITHER

OR

REFERENCES

The following have been texts in previous years and may be useful for supplementary reading and exercises:
Howell, D.C. Statistical methods for psychology (earlier editions than 5th ) Belmont CA: Duxbury.