Course Outline

PSYC3001

Research Methods 3

School of Psychology

Faculty of Science

Term 1, 2020

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1. Staff

Position	Name	Email	Consultation times and contact details
Course convenor, Lecturer	Dr Melanie Gleitzman	m.gleitzman@unsw.edu.au	By appointment and email. Office: Mathews 1108. Phone: 9385 3019
Tutors	Dr Sonny Li (Head Tutor)	sonny.li@unsw.edu.au	By appointment and email.
	Miranda Chilver	m.chilver@unsw.edu.au	
	Jodie Kidd	j.kidd@unsw.edu.au	
	Angela Liang	angela.liang@unsw.edu.au	
	Natalie Reily	n.reily@unsw.edu.au	
	Jodie Pestana	j.pestana@unsw.edu.au	
	Catherine Viengkham	c.viengkham@unsw.edu.au	

Enquiries and Consultation

- *Email is the preferred method of communication with course personnel. Use your student UNSW email account and include your student ID.*
- *Contact Dr Gleitzman if you have any special learning needs which may affect your access to this course or your ability to undertake any of the assessments. If you are registered with UNSW Equitable Learning Service, you are required to provide your Letter of Support at the commencement of the course, or within one week of receiving your learning and assessment adjustments.*

2. Course information

Units of credit:	6
Pre-requisite(s):	Prerequisite: PSYC2001. PSYC3001 is compulsory for students undertaking a major in psychology. Students are required to have completed PSYC2001 (or similar approved course at another university), and are assumed to have a basic understanding of inferential statistical procedures and research design. Students are expected to be competent in carrying out simple data analyses using a statistical package, such as SPSS.
Teaching Times and Locations	PSYC3001 Timetable Lectures and Tutorials begin in Week 1.

2.1 Course summary

The course deals with various experimental designs involving between- and within-subjects factors, for which some form of analysis of variance is an appropriate method of data analysis. Particular emphasis is placed on the use of simultaneous test procedures and simultaneous confidence intervals to produce coherent analyses of data from complex experiments.

Course Topics:

1. The two-group randomised experiment. Review of statistical inference on a comparison between two means: hypothesis tests and confidence intervals. Levels of inference: confidence interval inference, directional inference, inequality inference. Inferential errors - Type I, Type II and Type III errors, non-coverage errors. Practical equivalence inference.
2. The problem of multiple comparisons with more than two groups. Monte Carlo sampling experiments. Logical and statistical dependence among comparisons. Error rate units: Per-comparison error rate and familywise error rate. Error rates for individual t-test of maximal comparison when J > 2.
3. Controlling the familywise error rate for test of the maximal comparison. The Tukey (Honestly Significant Difference) multiple comparison procedure (MCP) based on the range of means. Properties of the Tukey simultaneous test procedure (STP) and simultaneous confidence interval procedure (SCI).
4. Single-factor fixed-effects ANOVA model. Effect parameters, effect size and levels of inference. Partition of variation and degrees of freedom. The standard ANOVA-model analysis. Assumptions. Central and non-central *F* distribution. Heterogeneity inference.
5. Contrasts on effect parameters and population means. Simple and complex contrasts. Contrast statistics. The sampling distribution of the sample value of a single planned contrast. CI and directional inference on a single planned contrast – unstandardised and standardised effect size. Scale of contrast coefficients.
6. Controlling the familywise error rate with the *F* STP. The maximal contrast. The Scheffé SCI procedure. Coherence and consonance. Carrying out an *F*-based analysis with PSY. Unstandardised and standardised CIs.
7. Planned vs post hoc analyses. Alternative to the *F* STP for planned contrast analyses. The Bonferroni-*t* procedure: tests and CIs on planned contrasts. Using PSY to carry out Bonferroni *t* analyses.
8. Simultaneous vs sequential MCPs. Comparison of simultaneous MCPs: Scheffé, Bonferroni and Tukey procedures. Examples of sequential MCPs that do not control FWER - 'protected' *t*-test procedures.
9. Orthogonal contrasts. Properties of orthogonal contrasts. Controlling the per-contrast error rate (PCER) in analyses of planned orthogonal contrasts.
10. Trend contrasts – ANOVA model analysis of single factor experiments with a quantitative IV. Inference on planned linear, quadratic and cubic trend contrasts controlling PCER.
11. The 2 $\times$ 2 factorial design. Parameters of two-factor ANOVA model. Sources of variation. Factorial effect contrasts (simple effect, main effect, interaction). The cell means model.

12. Planned contrasts analysis of *J* × *K* factorial between-subjects design. Bonferroni-*t* procedure for analysis of main effect and interaction contrasts.
13. Post-hoc analysis of *J* × *K* factorial between-subjects design. Heterogeneity inference. *F* STPs for main effect and interaction contrasts. Scheffé SCIs.
14. Planned and post hoc coherent analyses of *J* × *K* factorial designs allowing for inferences on simple effects. The A (or B) simple-effects model and the A(B) [or B(A)] family of contrasts. The all-factorial-contrasts family.
15. Single factor within subjects design. Planned analyses of within subjects contrasts. The MANOVA (multivariate analysis of variance) model vs ANOVA (univariate analysis of variance) model analysis for single-factor within-subjects data. Assumptions.
16. Two-factor mixed designs, B × (W) with one between subjects factor and one within subjects factor. Planned analyses of main and interaction contrasts, based on the two-factor model. The multivariate vs univariate model for mixed factorial designs. Planned analyses of B × (W) factorial designs allowing for inferences on simple effect contrasts.
17. Two-factor within-Ss designs, (W × W). Planned analyses of main and interaction contrasts based on two-factor multivariate model. Planned analyses allowing for inferences on simple effect contrasts.

2.2 Course aims

This course builds upon the data analytic methods and concepts developed in PSYC2001 and is concerned with data analytic methods that allow for confident inference on generalised comparisons between means (contrasts) for between-subjects designs with more than *two* groups, and within subjects designs with *two or more* occasions of measurement.

This course aims: (i) to provide students with an understanding of analysis of variance models and associated data analysis methods; (ii) to equip students with skills to choose appropriate data analysis method for a range of experimental designs, and to carry out these analyses using statistical packages such as SPSS and PSY; (iii) to equip you with skills to interpret analysis outcomes and to critically evaluate findings of published experiments.

2.3 Course learning outcomes (CLO)

At the successful completion of this course each student should be able to:

1. describe, apply and evaluate different inferential data analysis methods appropriate for single factor and two-way factorial designs with between-subjects and/or within-subjects factors; understand best practice in data analysis methods;
2. make heterogeneity inferences for overall tests, and make directional and confident inferences regarding estimates of treatment effects in contrasts analyses;
3. carry out a simple effects contrasts analysis of factorial data; carry out a trend contrasts analysis across levels of one or more quantitative factors;
4. use a statistical package (such as SPSS) and School of Psychology statistical program PSY to carry out these analyses.

2.4 Relationship between course and program learning outcomes and assessments

	Program Learning Outcomes						
CLO	1. Knowledge	2. Research Methods	3. Critical Thinking Skills	4. Values and Ethics	5. Communication, Interpersonal and Teamwork	6. Application	**Assessment**
1.	Lectures, tutorials, online activities	Lectures, tutorials, online activities	Lectures, tutorials, online activities	Lectures, tutorials, online activities			Assignment, Mid-semester test, Final exam
2.	Lectures, tutorials, online activities	Lectures, tutorials, online activities					Assignment, Mid-semester test, Final exam
3.	Lectures, tutorials, online activities	Lectures, tutorials, online activities				Lectures, tutorials, online activities	Assignment, Mid-semester test, Final exam
4.	Lectures, tutorials, online activities	Lectures, tutorials, online activities			Lectures, tutorials, online activities		Assignment, Mid-semester test, Final exam

3. Strategies and approaches to learning

3.1 Learning and teaching activities

The methods covered in this course deal with the analysis of data from *experimental* designs, which are often used in the sub-disciplines of cognition, perception, social and developmental psychology, human and animal learning, and applied areas of psychology, and as such are relevant for the associated Level III Psychology Electives.

Course content for each topic will be discussed in Lectures, in the first instance, and then in statistics and computing tutorials. Tutorials provide students with an opportunity to consolidate and apply their understanding of course material. Practice activities will be posted to Moodle on a regular basis.

3.2 Expectations of students

It is expected that students

- are aware of UNSW Assessment policy and understand how to apply for special consideration if they are unable to complete an assignment/exam due to illness and/or misadventure;
- have read through the School of Psychology Student Guide;
- undertake sufficient independent learning each week (recommended at least nine hours of independent learning per week).

Attendance at face to face tutorials and timely completion of online tutorials is an essential requirement of the course, in accordance with UNSW Assessment Implementation Procedure.

Formal teaching in this course is via two weekly two-hour lectures, a weekly one-hour statistics tutorial and a weekly one-hour computing tutorial. Lectures and tutorials provide a valuable and necessary context in which students gain an understanding of course material. Lecture slides and course notes will be made available before the start of a new lecture topic. Tutorials and related activities will be posted to Moodle on a weekly basis, before the start of a new topic.

Lectures are recorded, however **lecture attendance is strongly advised**. Recordings provide an opportunity to review lecture material in order to clarify your understanding of course material. In order to keep up with this course, you will need to be on track with lecture material. Attendance at lectures is the best way to ensure you do not fall behind. After each lecture you should spend some time reviewing your notes and undertaking additional reading where necessary (such as relevant course notes and chapter of the textbook) to ensure that you fully understand the course material and can take full advantage of the learning opportunity afforded by the lectures and tutorials.

Practice activities and selected worked solutions are provided on Moodle for each topic. Students are encouraged to work through these activities after the topic has been covered in lectures and tutorials. If you have course related questions you should ask these in the first instance in your statistics or computing tutorial. You may also email your tutor or post your question to the Discussion forum.

An aggregate mark of 50 or higher across the assessments is required to pass the course. Students need not pass each assessment in order to pass the course. Note that students who do not attempt an assessment will receive a mark of 0 for that component.

All news updates and announcements will be posted to Moodle page and/or by email. It is each student's responsibility to check Moodle and student email regularly to keep up to date.

The final exam for this course will take place on UNSW Sydney campus during the UNSW examinations period. Students should not arrange travel during the UNSW exam period.

Students registered with Equitable Learning Service must provide the course co-ordinator with a Letter of Support as soon as they are made available.

4. Course schedule and structure

This course consists of 40 hours of lectures, 20 hours of face to face tutorials and 2 hours of online tutorials. Students are expected to take an additional 90 hours of self-determined study to complete assessments, practice questions, readings, and exam preparation. See Section 2.1 for description of Topics.

NOTE: Schedule subject to change.

Weekly Lectures	Lecture Topics	Statistics Tutorial	Computing Tutorial	Self-determined Activities
Week 1 17/02/2020 Mon 12-2pm 20/02/2020 Thurs 3-5pm	Lecture 1: Topic 1 Lecture 2: Topic 2	Topic 1	Topic 1	See Moodle
Week 2 24/02/2020 Mon 12-2pm 27/02/2020 Thurs 3-5pm	Lecture 3: Topic 3 Lecture 4: Topic 4	Topic 2	Topic 3	See Moodle
Week 3 02/03/2020 Mon 12-2pm 05/03/2020 Thurs 3-5pm	Lecture 5: Topic 5 Lecture 6: Topic 6	Topic 4	Topic 5, Intro to PSY	See Moodle
Week 4 09/03/2020 Mon 12-2pm 12/03/2020 Thurs 3-5pm	Lecture 7: Topic 6, 7 Lecture 8: Topic 7, 8	Topic 6	Topic 6, 7	See Moodle
Week 5 16/03/2020 Mon 12-2pm 19/03/2020 Thurs 3-5pm	Lecture 9: Topic 9 Lecture 10: Topic 10	Topic 7, 8	Topic 8, 9	See Moodle
Week 6 **23/03/2020 Mon 12-2pm** 26/03/2020 Thurs 3-5pm	**Mid-Term Test** Lecture 11: Topic 11, 12	Topic 9 Topic 11 (online tutorial)	Topic 9, 10	See Moodle
Week 7 30/03/2020 Mon 12-2pm 02/04/2020 Thurs 3-5pm	Lecture 12: Topic 12 Lecture 13: Topic 13, 14	Topic 12	Topic 13	See Moodle
Week 8* 06/04/2020 Mon 12-2pm 09/04/2020 Thurs 3-5pm *10/04/2020 Fri public hol*	Lecture 14: Topic 14 Lecture 15: Topic 15	Topic 13, 14	Topic 14	See Moodle
Week 9* *13/04/2020 Mon Public hol* **14/04/2020 Tues 11pm** 16/04/2020 Thurs 3-5pm	*No Lecture* **Assignment due** Lecture 16: Topic 16	Topic 15 (online tutorial) Topic 16	Topic 16	See Moodle
Week 10 20/04/2020 Mon 12-2pm 23/04/2020 Thurs 3-5pm	Lecture 17: Topic 16 Lecture 18: Topic 17	Topic 16	Topic 17	See Moodle
Week 11 27/04/2020 Mon 12-2pm	Lecture 19: Review	*Revision tutorials Tuesday only*		
* Students to attend alternative tutorials in lieu of Week 8 Good Friday and Week 9 Easter Monday. See Moodle announcement closer to the time.				

Study period: 29/04/2020 – 01/05/2020. Exam period: 02/05/2020 – 15/05/2020.

5. Assessment

5.1 Assessment tasks

All assessments in this course have been designed and implemented in accordance with UNSW Assessment Policy.

Assessment Task	Length	Weight	Mark	Due date
Assessment 1: Mid-Term Test	90 minutes	20%	out of 100	12-2pm Monday 23/03/2020 (Week 6)
Assessment 2: Assignment	1500-2000 words	20%	out of 100	Submit to Moodle by 11pm Tuesday 14/04/2020 (Week 9)
Assessment 3: Final exam	2 hours	60%	out of 100	Exam period

Assessment 1: A Mid-Term Test worth 20% of the course mark will be held during the **Monday lecture timeslot in Week 6 (12-2pm, 23/03/2020,** locations tbc). The test will be on Topics 1-8. Statistical tables will be provided. You are required to provide your own UNSW approved calculator.

Assessment 2: An Assignment worth 20% of the course mark is due by **11pm Tuesday of Week 9 (14/04/2020)** and is to be submitted to the Turnitin link on Moodle. This exercise will cover material drawn from Topics 9 - 13. The exercise will be set in Week 6 and will require you, among other things, to carry out a contrasts analysis using the PSY statistical program.

Assessment 3: A two-hour Final Exam worth 60% of your course mark will be held during the T1 Examination period. Statistical tables will be provided, you are required to provide your own UNSW approved calculator –see Required Equipment (section 7 of this outline).

UNSW grading system: https://student.unsw.edu.au/grades

UNSW assessment policy: https://student.unsw.edu.au/assessment

5.2 Assessment criteria and standards

Further details and marking criteria for each assessment will be provided to students closer to the assessment release date (see 4.1: UNSW Assessment Design Procedure).

5.3 Submission of assessment tasks

Assessment 2: In accordance with UNSW Assessment Policy the Assignment must be submitted online via Turnitin. No paper or emailed copies will be accepted.

Late penalties: deduction of marks for late submissions will be in accordance with School policy (see: School of Psychology Student Guide).

Special Consideration: Students who are unable to complete an assessment task by the assigned due date can apply for special consideration.

UNSW operates under a Fit to Sit/ Submit rule for all assessments. If a student wishes to submit an application for special consideration for an exam or assessment, the application must be submitted **prior to the** start of the exam or **before** an assessment is submitted. If a student sits the exam/ submits an assignment, they are declaring themselves well enough to do so.

Special consideration applications must be submitted to the online portal along with Third Party supporting documentation. Students who have experienced significant illness or misadventure during the assessment period may be eligible. Only circumstances deemed to be outside of the student's control are eligible for special consideration. Except in unusual circumstances, the duration of circumstances impacting academic work must be more than 3 consecutive days, or a total of 5 days within the teaching period. In the case of the assignment, if approved, students may be given an extended due date to complete the assignment, or a supplementary assessment may be set.

See https://student.unsw.edu.au/special-consideration.

Supplementary assessment: will be subject to approval and implemented in accordance with UNSW Assessment Implementation Procedure.

Supplementary examination: will be made available for students with approved special consideration application and implemented in accordance with UNSW Assessment Policy. Students are reminded that the School of Psychology offers **one opportunity only** to sit a supplementary exam.

5.4. Feedback on assessment

Feedback on all pieces of assessment in this course will be provided in accordance with UNSW Assessment Policy.

Assessment	When	How
Assessment 1	Ten working days after the assessment date.	Test papers returned to students.
Assessment 2	Ten working days after the assessment date.	Feedback from Turnitin.
Final exam	N/A	N/A

6. Academic integrity, referencing and plagiarism

The APA (7th edition) referencing style is to be adopted in this course. Students should consult the publication manual itself (rather than third party interpretations of it) in order to properly adhere to APA style conventions. Students do not need to purchase a copy of the manual, it is available in the library or online. This resource is used by assessment markers and should be the only resource used by students to ensure they adopt this style appropriately.

Referencing is a way of acknowledging the sources of information that you use to research your assignments. You need to provide a reference whenever you draw on someone else's words, ideas or research. Not referencing other people's work can constitute plagiarism.

Further information about referencing styles can be located at
https://student.unsw.edu.au/referencing

Academic integrity is fundamental to success at university. Academic integrity can be defined as a commitment to six fundamental values in academic pursuits**:** honesty, trust, fairness, respect, responsibility and courage.[1] At UNSW, this means that your work must be your own, and others' ideas should be appropriately acknowledged. If you don't follow these rules, plagiarism may be detected in your work.

Further information about academic integrity and **plagiarism** can be located at:

- The *Current Students* site https://student.unsw.edu.au/plagiarism**,** and
- The *ELISE* training site https://subjectguides.library.unsw.edu.au/elise

The *Conduct and Integrity Unit* provides further resources to assist you to understand your conduct obligations as a student: https://student.unsw.edu.au/conduct.

7. Readings and resources

Course information	The **PSYC3001 Moodle site** provides course information and lecture slides, course notes and tutorial exercises, practice questions and activities, discussion forum and announcements, course resources. Most students should find that the lecture slides, course notes, tutorial handouts, practice questions and solutions provide enough material for understanding the course content and completing the assessments.
Textbook (recommended)	Bird, K.D. (2004). Analysis of Variance via Confidence Intervals. London: Sage Publications. NOTE: available ***online*** via UNSW Library
Additional Reference	Keppel, G., & Wickens, T. D. (2004). Design and Analysis: A Researcher's Handbook. (4th Ed.). Upper Saddle River, NJ: Pearson.
Required materials	Students should bring a calculator to each tutorial, and to the Mid-semester test and Final Exam. **Note**: Students are required to use a *UNSW approved calculator* for the Final Exam. Information regarding this matter can be found on MyUnsw. School of Psychology Student Guide.
Recommended internet sites	UNSW Library UNSW Learning centre

[1] International Center for Academic Integrity, 'The Fundamental Values of Academic Integrity', T. Fishman (ed), Clemson University, 2013.

	ELISE Turnitin Student Code of Conduct Policy concerning academic honesty Email policy UNSW Anti-racism policy UNSW Equity, Diversity and Inclusion policy

8. Administrative matters

The School of Psychology Student Guide contains School policies and procedures relevant for all students enrolled in undergraduate or Masters psychology courses, such as:

- Attendance requirements
- Assignment submissions and returns
- Assessments
- Special consideration
- Student code of conduct
- Student complaints and grievances
- Equitable Learning Services
- Health and safety

It is expected that students familiarise themselves with the information contained in this guide.

9. Additional support for students

- The Current Students Gateway: https://student.unsw.edu.au/
- Academic Skills and Support: https://student.unsw.edu.au/academic-skills
- Student Wellbeing, Health and Safety: https://student.unsw.edu.au/wellbeing
- Equitable Learning Services: https://student.unsw.edu.au/els
- UNSW IT Service Centre: https://www.myit.unsw.edu.au/