

PSYC 312	Experimental Design and Quantitative Methods in Psychology	SS17
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Instructor:	Dr K. Edwin Sheppard/Dr. Melissa Boyce	Lecture Location:	TR
Phone:	403-220-8970/403-210-6257	Lecture Days/Time:	12:00pm – 2:45pm
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Contact your course instructor regarding general course issues, questions about lecture material and course content, and grading of exams. Contact your lab instructor regarding lab material, assignments, or the final paper.

Course Description

This course aims to help you to develop the skills required to (a) conduct and analyze scientific research in psychology, (b) communicate your research to others, and (c) evaluate research by other psychologists. These skills are central to success as a psychology major* (not to mention as a research psychologist). At a more general level, this course is designed to help you develop methodological, analytical, and communication skills that are invaluable in a wide range of everyday applications and in numerous lines of work.

A final grade of at least an A- is required in this course or in an advanced research methods and statistics course (PSYC 407, PSYC 411, PSYC 417) in order to be admitted to the honours program in psychology.

Note: This course focuses on quantitative approaches. Students interested in qualitative psychological research should consider Psyc 415 - *Qualitative Inquiry in Psychology* upon completion of this course.

The laboratory component of the course is designed to facilitate experiential learning (learning by doing) of the material, and hence the lab assignments are integrated with the lecture schedule.

Course Learning Outcomes

The Department of Psychology is committed to student knowledge and skill development. The table below lists the key learning outcomes for this course, the program-learning outcomes they facilitate (see psyc.ucalgary.ca/undergraduate/program-learning-outcomes), and the expected level of achievement.

Course Learning Outcomes	PLO(s)	Level(s)
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Describe the theoretical underpinnings of various statistical analyses and assumptions that must be met to conduct these statistical analyses	3	C
Accurately determine which statistical analysis is appropriate based on a study's research question and methodology and draw appropriate conclusions based on the results of a statistical analysis	2, 3, 4	C
Conduct statistical calculations by hand and using statistical software and collect, organize, and manipulate data using statistical software	3	C
Contrast various research methodologies for strengths and weaknesses.	2, 7	C
Describe and provide recommendations for how to deal with ethical issues in research	2, 6	I
Design a study to test a novel research question using an appropriate methodology	1, 2, 3, 4, 5, 6, 7	C
Create and orally present a poster to depict the results of an original study	3, 4, 5, 7	C
Write all elements of a laboratory report in APA format	3, 4, 5	C
Use PSYCINFO to locate primary research relevant to a specific topic	5	A
Critically evaluate research methodology and make recommendations for how to improve a research design.	2, 7	C
Critique all components of a published research paper.	2, 6, 7	I
Draw and interpret graphical depictions of data (single factor and factorial)	2, 3, 4	C

Notes. PLOs = Program-Learning Outcomes: 1 = demonstrate knowledge of psychological sciences, 2 = think critically and solve problems, 3 = conduct research and analyze data, 4 = communicate effectively, 5 = demonstrate information literacy, 6 = understand and implement ethical principles, 7 = apply psychological knowledge and skills. Level of PLO achievement facilitated by this course: I = introductory, C = competency, A = advanced.

Prerequisites

Math 30 or 31 or Mathematics II and PSYC 200 – Principles of Psychology I

Recommended Text

Howell, D. C. (2014). *Fundamental Statistics for the Behavioral Sciences (8th Ed.)*. Belmont, CA: Thomson Wadsworth.

It is also STRONGLY recommended that you obtain a copy of the *Publication Manual of the American Psychological Association (6th Ed.)* as you will be expected to conform to APA format in all assignments you submit.

Both books are available in the university bookstore.

Evaluation

Class components (60% of final grade).

Exams. There will be four in-class exams during this course; all exams will be multiple-choice and will focus on lecture material. The exams will be worth 15% of your mark each (60% total) and will be non-cumulative insofar as they will be limited to material covered since the previous exam. However, many of the concepts in this course are inherently cumulative in that they assume knowledge and understanding of material introduced earlier.

Exam dates and topics are as follows:

	Date	Topics
Exam 1	June 1, 2017	The Science of Psychology, The Role of Statistics in Research, Ethics, Research Ideas and Hypotheses, and Selecting, Measuring, and Manipulating Variables, Non-Experimental Methods
Exam 2	June 27, 2017	Non-Experimental Methods, Internal Validity, Alternative Research Designs, Plotting Data, Measures of Central Tendency, and Measures of Variability, Normal Distribution, z-Scores, Probability Theory, and Hypothesis Testing
Exam 3	July 18, 2017	The One Sample <i>t</i> -test, Confidence Limits on the Mean, Experiments with Two Groups: The <i>t</i> -test for Independent Samples and the Wilcoxon Rank Sum Test, Statistical Power, Single Factor Experiments with More than Two Groups: One-Way ANOVA, Multiple Comparisons
Exam 4	August 15, 2017	Factorial Designs, Factorial ANOVA, Within-subjects Two Group Designs: Paired <i>t</i> -tests and Wilcoxon Signed Rank Test, Repeated Measures ANOVA, Chi-Square, Correlation, Regression, Multiple Regression

Lab components (40% of final grade).

Report. A typed, double-spaced, scientific report based on a study to be conducted during lab. The final version, worth 20% of your course grade, is due at the beginning of lab on August 8 or 10 (depending on your lab section). Instructions for completing your report will be posted on D2L and provided in lab.

Labs. Each student must be registered in a lab section associated with this lecture section. There will be ten lab assignments, which in total will comprise 20% of your course grade. Lab assignments will be due in hard copy at the beginning of lab (due dates indicated on course schedule below). The grades allocated for each assignment are as follows:

Lab Assignment 1: Literature Search

2%

Lab Assignment 2: Observational Research	2%
Lab Assignment 3: Survey Research Parts 1 & 2	2%
Lab Assignment 4: Poster	2%
Lab Assignment 5: Independent Samples t-tests	2%
Lab Assignment 6: One-Way ANOVA	2%
Lab Assignment 7: Draft of Intro & Methods	2%
Lab Assignment 8: Paired t-Tests	2%
Lab Assignment 9: Repeated Measures ANOVA	2%
<u>Lab Assignment 10: Correlation and Regression</u>	<u>2%</u>
Total 20%	

NOTE: There will be components of the labs that you are expected to complete in your own time. It is extremely important that you do this work prior to the allotted deadlines, as future labs will be based on the work that you do outside of the lab.

It is expected that you will complete all components of the course. If you miss an exam without medical documentation, you will receive a score of 0 for that exam. Late lab assignments (including the final paper) will be deducted 5% per day (including weekends) up to a maximum of 35% (7 days), at which point, late assignments will no longer be accepted without medical documentation. All assignments must be submitted in hard copy at the beginning of lab.

Students must achieve a passing grade on BOTH the class and lab components to pass this course.

Calculators & Formula Sheets

For tests requiring computations, a non-graphics based calculator may be used. For some tests, formula information will be provided at the time of the test. No other resources (textbook, notes) are allowed during tests.

Department of Psychology Grade Distribution Policy

The distribution of grades in Psychology courses (the percentage of A grades, B grades, etc.) will be similar to the distribution of grades in other courses in the Faculty of Arts. The Department monitors the grade distributions of 200-, 300-, and 400-level courses in the Faculty to ensure that the grade distributions in Psychology courses are comparable. Based on these reviews, students can expect that 1) up to 30% of grades in 200- and 300-level psychology courses will be "A" grades (A+, A, and A-), and 2) up to 40% of grades 400-level psychology courses will be "A" grades.

Department of Psychology Criteria for Letter Grades

Psychology professors use the following criteria when assigning letter grades:

A+ grade: *Exceptional Performance.* An A+ grade indicates near perfect performance on multiple choice and short answer exams. For research papers/essays/course projects/presentations, an A+ grade is awarded for exceptional work deserving of special recognition and is therefore not a common grade.

A, A- Range: *Excellent Performance.* Superior understanding of course material. Written work is very strong in terms of critical and original thinking, content, organization, and the expression of ideas, and demonstrates student's thorough knowledge of subject matter.

B Range: *Good Performance*. Above average understanding of course material. Written work shows evidence of critical thinking and attention to organization and editing but could be improved in form and/or content.

C Range: *Satisfactory Performance*. Adequate understanding of course material. Knowledge of basic concepts and terminology is demonstrated. Written work is satisfactory and meets essential requirements but could be improved significantly in form and content. Note: All prerequisites for courses offered by the Faculty of Arts must be met with a minimum grade of C-.

D range: *Marginally meets standards*. Minimal understanding of subject matter. Written work is marginally acceptable and meets basic requirements but requires substantial improvements in form and content. Student has not mastered course material at a level sufficient for advancement into more senior courses in the same or related subjects.

F grade: *Course standards not met*. Inadequate understanding of subject matter. Written work does not meet basic requirements. Student has not demonstrated knowledge of course material at a level sufficient for course credit.

Grading Scale

A+	96-100%	B+	80-84%	C+	67-71%	D+	54-58%
A	90-95%	B	76-79%	C	63-66%	D	50-53%
A-	85-89%	B-	72-75%	C-	59-62%	F	0-49%

As stated in the University Calendar, it is at the instructor’s discretion to round off either upward or downward to determine a final grade when the average of term work and final examinations is between two letter grades. To determine final letter grades, final percentage grades will be rounded up or down to the nearest whole percentage (e.g., 89.5% will be rounded up to 90% = A but 89.4% will be rounded down to 89% = A-).

Tentative Lecture Schedule

Week	Date	Topic	Text Material	Lab Topic	Lab Assignment Due
1	T May 16	Introduction to the Course and the Science of Psychology	Ch. 1	Conducting a Literature Search, Writing Research Papers in APA format, and Avoiding Plagiarism	
	R May 18	The Role of Statistics in Research and Ethics	Ch. 2		
	F May 19	<i>Last day to change spring registration</i>			

2	M May 22	Victoria Day. UNIVERSITY CLOSED.		No lab (due to Victoria Day on Monday)	
	T May 23	Research ideas and Hypotheses and Selecting Measures			
	R May 25	Measuring, and Manipulating Variables and Non-Experimental Methods I			
3	T May 30	Non-Experimental Methods II and III		Survey Research Part I: Survey Development	Literature Search Assignment due at the beginning of lab
	R June 1	Exam 1			
4	T June 6	Internal Validity and Alternative Research Designs		Observational Research	
	R June 8	I Plotting Data	Ch. 3		
5	T June 13	Measures of Central Tendency and Variability	Ch. 4 and 5	Survey Research Part II: Data Analysis and Putting Together a Poster	Observational Research Lab Assignment due at the beginning of lab
	R June 15	The Normal Distribution and Practice with z-scores	Ch. 6		
6	T June 20	Probability and Hypothesis Testing Part I	Ch. 7 and 8	Poster Session, Participate in an online	Survey Research Assignment

	R June 22	Hypothesis Testing Part II and Review for Exam 2	Ch. 8	study, and Outline of final research paper	and Poster due at the beginning of lab
8	T June 27	Exam 2		No lab (due to end of Spring term on Tuesday)	

Week	Date	Topic	Text Material	Lab Topic	Lab Assignment
1	T July 4	The One-Sample t-test and Confidence Limits on the mean	Ch. 12	Independent Samples t-tests	
	R July 6	Experiments with Two Groups: The t-test for Independent Groups and the Wilcoxon Rank Sum Test	Ch. 14 and Ch. 20		
2	T July 11	Power and Experiments with More than Two Groups: One-Way ANOVA	Ch. 15 and Ch. 16	Analyze data for final paper	Independent Samples t-test Assignment due at the beginning of lab
	R July 13	Experiments with More than Two Groups: Multiple Comparisons and Review for Exam 3	Ch. 16		
3	T July 18	Exam 3	Ch. 17		

	R July 20	Factorial Designs	Ch. 17	One Way ANOVA and Paired t-tests	Draft of Research Paper Intro and Method due at the beginning of lab
4	T July 25	Between-Subjects Factorial ANOVA		Repeated Measures ANOVA and Correlation/Regression	One Way ANOVA and Paired t-test Assignments due at the beginning of lab
	R July 27	Within-Subjects Designs: The Paired t-test and the Wilcoxon Signed Rank Test	Ch. 13 and 20		
5	T Aug 1	Repeated Measures ANOVA	Ch. 18	Q and A about final research paper (can be used as a work period)	Repeated Measures and ANOVA and Correlation/Regression Assignments due at the beginning of lab
	R Aug 3	Chi-Square	Ch. 19		
6	T Aug 8	Correlation and Regression	Ch. 9 and 10	Critiquing Research	Research Paper due at the beginning of lab
	R Aug 10	Multiple Regression and Review	Ch. 11		
7	T Aug 15	Exam 4 <i>Summer Term Lectures End. Last day to withdraw from full session Summer Term courses.</i>		No lab (due to end of term)	

Reappraisal of Grades

A student who feels that a piece of graded term work (e.g., term paper, essay, test) has been unfairly graded, may have the work re-graded as follows. The student shall discuss the work with the instructor within 15 days of being notified about the mark or of the item's return to the class; no reappraisal of term work is permitted after the 15 days. If not satisfied, the student shall immediately take the matter to the Head of the department offering the course, who will arrange for a reassessment of the work within the next 15 days. The reappraisal of term work may cause the grade to be raised, lowered, or to remain the same. If the student is not satisfied with the decision and wishes to appeal, the student shall address a letter of appeal to the Dean of the faculty offering the course within 15 days of the unfavourable decision. In the letter, the student must clearly and fully state the decision being appealed, the grounds for appeal, and the remedies being sought, along with any special circumstances that warrant an appeal of the reappraisal. The student should include as much written documentation as possible.

Plagiarism and Other Academic Misconduct

Intellectual honesty is the cornerstone of the development and acquisition of knowledge and requires that the contribution of others be acknowledged. Consequently, plagiarism or cheating on any assignment is regarded as an extremely serious academic offense. Plagiarism involves submitting or presenting work in a course as if it were the student's own work done expressly for that particular course when, in fact, it is not. Students should examine sections of the University Calendar that present a Statement of Intellectual honesty and definitions and penalties associated with Plagiarism/Cheating/Other Academic Misconduct.

Academic Accommodation

Students seeking an accommodation based on disability or medical concerns should contact Student Accessibility Services; SAS will process the request and issue letters of accommodation to instructors. For additional information on support services and accommodations for students with disabilities, visit www.ucalgary.ca/access/.

Students who require an accommodation in relation to their coursework based on a protected ground other than disability should communicate this need in writing to their Instructor.

The full policy on Student Accommodations is available

at http://www.ucalgary.ca/policies/files/policies/student-accommodation-policy_0.pdf.

Students who have not registered with the Disability Resource Centre are not eligible for formal academic accommodation. You are also required to discuss your needs with your instructor no later than 14 days after the start of this course.

Absence From A Test/Exam

Makeup tests/exams are **NOT** an option without an official University medical excuse (see the University Calendar). A completed Physician/Counselor Statement will be required to confirm absence from a test/exam for health reasons; the student will be required to pay any cost associated with this Statement. Students who miss a test/exam have up to 48 hours to contact the instructor and to schedule a makeup test/exam. Students who do not schedule a makeup test/exam with the instructor within this 48-hour period forfeit the right to a makeup test/exam. At the instructor's discretion, a makeup test/exam may differ significantly (in form and/or content) from a regularly scheduled test/exam. Except in extenuating circumstances (documented by an official University medical excuse), a makeup test/exam must be written within 2 weeks of the missed test/exam during exam make-up hours.

provided by the department <http://psychology.ucalgary.ca/undergraduate/exam-review-and-makeup-exams>. If a student cannot write their final exam on the date assigned by the Registrar's Office, they need to apply for a deferred exam http://www.ucalgary.ca/registrar/exams/deferred_final. Under no circumstances will this be accommodated by the department.

Travel During Exams

Consistent with University regulations, students are expected to be available to write scheduled exams at any time during the official December and April examination periods. Requests to write a make-up exam because of conflicting travel plans (e.g., flight bookings) will NOT be considered by the department. Students are advised to wait until the final examination schedule is posted before making any travel arrangements. If a student cannot write their final exam on the date assigned by the Registrar's Office, they need to apply for a deferred exam http://www.ucalgary.ca/registrar/exams/deferred_final. Under no circumstances will this be accommodated by the department.

Freedom of Information and Protection of Privacy (FOIP) Act

The FOIP legislation disallows the practice of having student's retrieve tests and assignments from a public place. Therefore, tests and assignments may be returned to students during class/lab, or during office hours, or will be made available only for viewing during exam review sessions scheduled by the Department. Tests and assignments will be shredded after one year. Instructors should take care to not link students' names with their grades, UCIDs, or other FOIP-sensitive information.

Course Credits for Research Participation (Max 2% of final grade)

Students in most psychology courses are eligible to participate in Departmentally approved research and earn credits toward their final grades. **A maximum of two credits (2%) per course, including this course, may be applied to the student's final grade. Students earn 0.5% (0.5 credits) for each full 30 minutes of participation.** The demand for timeslots may exceed the supply in a given term. Thus, students are not guaranteed that there will be enough studies available to them to meet their credit requirements. Students should seek studies early in the term and should frequently check for open timeslots. Students can create an account and participate in Departmentally approved research studies at <http://ucalgary.sona-systems.com>. The last day to participate in studies and to assign or reassign earned credits to courses is **the last day of the summer term.**

Evacuation Assembly Point

In case of an emergency evacuation during class, students must gather at the designated assembly point nearest to the classroom. The list of assembly points is found at <http://www.ucalgary.ca/emergencyplan/assemblypoints>. Please check this website and note the nearest assembly point for this course.

Student Organizations

Psychology students may wish to join the Psychology Undergraduate Students' Association (PSYCHS). They are located in Administration 130 and may be contacted at 403-220-5567.

Student Union VP Academic: Phone: 403-220-3911 suvpaca@ucalgary.ca
Student Union Faculty Rep.: arts1@su.ucalgary.ca

Student Ombudsman's Office

The Office of the Student Ombudsmen provides independent, impartial and confidential support for students who require assistance and advice in addressing issues and concerns related to their academic careers. The office can be reached at 403-220-6420 or ombuds@ucalgary.ca (<http://www.ucalgary.ca/provost/students/ombuds>)

Safewalk

The safewalk program provides volunteers to walk students safely to their destination anywhere on campus. This service is free and available 24 hrs/day, 365 days a year.

Call 403-220-5333.

Important Dates

The last day to drop this course with no “W” notation and **still receive a tuition fee refund** is **May 19, 2017**. Last day for registration/change of registration is **May 19, 2017**. The last day to withdraw from this course is **June 27, 2017**.