
Psychology 312 (L01) Experimental Design and Quantitative Methods for Psychology

Instructor:	Dr. K. Edwin Sheppard	Lecture Location:	CHC 119
Phone:	403-220-8970	Lecture Days/Time:	M/W/F: 8:00-8:50
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Office Hours:	TBA		

Contact your instructor regarding general course issues, questions about lecture material and course content, and grading of exams.

Course Description and Goals

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.

Notes: 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 415) in order to be admitted to the honours program in psychology.

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 projects are integrated with the lecture schedule.

Prerequisites

Pure Mathematics 30 or Mathematics 30-1 or Mathematics II (offered by Continuing Education) or 50 percent or higher on the Mathematics Diagnostic Test (offered by the Mathematics and Statistics Department), and Psychology 200 – Principles of Psychology I.

Recommended Text

Howell, D. C. (2011). *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.

Course Notes

Notes for each week's classes will be posted at the beginning of the week. In addition, announcements, grades, and information regarding lab assignments and your research paper will be posted on this site. Web-based modules will be found here as well that you may use as an additional resource in this course.

Evaluation

Class components (60% of final grade).

Exams. There will be six exams during this course, each of which will be worth 10% of your mark and will cover lecture material. Exams will feature multiple-choice questions and are non-cumulative insofar as they will be limited to material covered since the previous test. However, many of the concepts in this course are inherently cumulative in that they assume knowledge and understanding of material introduced earlier.

Exam dates are as follows:

Fall Term

Exam 1: October 1, 2014
Exam 2: November 7, 2014
Exam 3: December 5, 2014

Winter Term

Exam 4: February 9, 2015
Exam 5: March 13, 2015
Exam 6: April 15, 2015

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 mark, is due at the beginning of **class** on Tuesday, April 6, 2015. Instructions for completing your report will be posted on blackboard 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 grade. Lab assignments will be due in hard copy at the beginning of lab (due dates indicated on lab schedule). Late assignments will not be accepted without a medical note. 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: <i>t</i> -Tests	2%
Lab Assignment 6: Factorial ANOVA	2%
Lab Assignment 7: Draft of Intro & Methods	2%
Lab Assignment 8: Paired <i>t</i> -Tests	2%
Lab Assignment 9: Repeated Measures ANOVA	2%
Lab Assignment 10: Regression	2%
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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 assignments 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.

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.

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 in 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. **In this course there will be no rounding up of final grades, especially in light of the opportunities students have to increase their final grade via research participation.**

Tentative Lecture Schedule: Fall Term

Week	Date	Important Dates	Lecture Topic	Relevant Web Module	Text Material	Lab Topic	Lab Assignment Due
1	M Sep 8	Lecture begins.	Introduction to the course.	Intro to Research Methods – Psychology and Science	Course Outline	NO LAB	
	W Sep 10		The Science of Psychology		Ch. 1		
	F Sep 12						
2	M Sep 15		The Role of Statistics in Research	Statistics Concepts	Ch. 2	Literature Search	
	W Sep		Ethics	Ethics			

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	F Sep 19	Last day to drop full courses (Multi-term) and Fall Term half courses. No refunds for full courses (Multi-term) or Fall Term half courses after this date.					
3	M Sep 22	Last day to add or swap full courses (Multi-term) and Fall Term half courses. Last day for change of registration from audit to credit or credit to audit.	Research Ideas and Hypotheses Measuring and Manipulating Variables	Generating and Refining Research Hypotheses Measurement – Reliability, Construct Validity		Writing Research Papers (in APA format)	Lit. Search Assignment due beginning of lab
	W Sep 24						
	F Sep 26	Fee payment deadline for Fall Term full and half courses.					
4	M Sep 29		Review			NO LAB	
	W Oct 1		EXAM 1	All Material to Date			
	F Oct 3		Choosing the Best Measures				
5	M Oct 6		Choosing the Best Measures Continued			Observational Research Lab	
	W Oct 8		Non-				

	F Oct 10		Experimental Methods				
6	M Oct 13	Thanksgiving Day, University closed (except Taylor Family Digital Library, Law, Medical, Gallagher and Business Libraries). No lectures.	Non- Experimental Methods Continued			NO LAB	
	W Oct 15						
	F Oct 17						
7	M Oct 20		Internal Validity, Alternative Research Designs, and Plotting Data	Internal Validity: Regression to the Mean		Survey Research Part 1: Survey Development **MUST COMPLETE ONLINE SURVEY BY SUN. OCT 26 AT 12:00PM	Observational Research Assignment due beginning of lab
	W Oct 22						
	F Oct 24						
8	M Oct 27		Measures of Central Tendency and Measures of Variability		Ch. 4 & 5	Survey Research Part 2: Data Analysis	
	W Oct 29						
	F Oct 31						
9	M Nov 3		Measures of Variability Continued			NO LAB	
	W Nov 5		Review				
	F Nov 7		EXAM 2	All material since Exam 1			

10	M Nov 10	Reading Days. No lectures.				NO LAB	
	T Nov 11	Remembrance Day (Observed). University Closed (except Taylor Family Digital Library, Law, Medical, Gallagher and Business Libraries). No lectures.					
	W Nov 12		The Normal Distribution	Intro to Hypothesis Testing – The Normal Distribution	Ch. 6		
	F Nov 14						
11	M Nov 17		Z-Scores Probability	Z-Scores Basic Concepts of Probability	Ch. 7	Putting together a poster	Survey Research Assignment due beginning of lab
	W Nov 19						
	F Nov 21						
12	M Nov 24		Hypothesis Testing	Intro to Hypothesis Testing: Hypothesis Testing, Sample Distributions	Ch. 8	Post Session	Poster due beginning of lab
	W Nov 26						
	F Nov 28			Type I and II Errors One and Two- Tailed Tests			
13	M Dec 1		Hypothesis Testing Continued			NO LAB	
	W Dec		Review				

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	F Dec 5	Fall Term Lectures End. Last day to withdraw with permission from Fall Term half courses.	EXAM 3	All material since Exam 2			
	Dec 8-18	Fall Term Exam Period.					

Tentative Lecture Schedule: Winter Term

Week	Date	Important Dates	Lecture Topic	Relevant Web Modules	Text Material	Lab Topic	Lab Assignment Due
14	M Jan 12	Winter term lectures begin.	The One-Sample t-test	Simple Experiments and Hypothesis Test of Means: Hypothesis Testing and the One Sample t-test	Ch. 12	NO LAB	
	W Jan 14		Confidence Limits on the Mean	Confidence Limits on the Mean			
	F Jan 16						
15	M Jan 19		Experiments with Two-Groups: The t-test for Independent Groups	The Simple Experiment: Comparing Two Groups	Ch. 14	Participate in a study and outline of research paper	
	W Jan 21						
	F Jan 23	Last day to drop Winter Term half-	Wilcoxon Rank Sum	Hypothesis Testing: Two Independent Samples			

		courses.	Test				
16	M Jan 26	Last day to add or swap Winter Term half courses. Last day for change of registration from audit to credit or credit to audit.	Statistical Power Experiments with More than Two Groups: One-Way	Statistical Power Multiple Group Experiments and ANOVA: The Multiple Group Experiment One-Way ANOVA	Ch. 15 & 16	Independent Groups t-test	
	W Jan 28						
	F Jan 30	Fee payment deadline for Winter Term fees.					
17	M Feb 2		Experiments with More than Two Groups			One-Way ANOVA: Analyze Experiment and Research Paper Q&A	Independent Groups t-test Assignment due beginning of lab
	W Feb 4		Continued: Multiple Comparisons				
	F Feb 6		Review				
18	M Feb 9		EXAM 4	All material since Exam 3		NO LAB	
	W Feb 11		Factorial Designs	Factorial Designs	Ch. 17		
	F Feb 13						
19	Feb 15- 22	Reading Week. No lectures. University open (except Family Day).				NO LAB	

	M Feb 16	Alberta Family Day, University closed (except Taylor Family Digital Library, Law, Medical, Gallagher and Business Libraries). No lectures.					
20	M Feb 23		Factorial ANOVA	Factorial ANOVA		Factorial ANOVA	Draft of Introduction and Methods due beginning of lab
	W Feb 25						
	F Feb 27						
21	M Mar 2		Factorial ANOVA continued	Repeated Measures - Matched-Pair Designs, Within-Subject Designs	Ch. 13	Paired t-tests	Factorial ANOVA assignment due beginning of lab
	W Mar 4		Within-Subjects Designs: The Paired t-test and the Wilcoxon Signed Rank Test	Hypothesis Testing: Related Samples			
	F Mar 6						
22	M Mar 9		Within-Subjects Designs Continued.			NO LAB	
	W Mar 11		Review				
	F Mar		EXAM 5	All material since Exam 4			

	13						
23	M Mar 16		Repeated Measures ANOVA	Repeated Measures ANOVA	Ch. 18 & 19	Repeated Measures ANOVA	Paired t-test Assignment due beginning of lab
	W Mar 18		Chi-Square	Chi-Square			
	F Mar 20						
24	M Mar 23		Introduction to the General Linear Model: Correlation and Regression	Correlation and Regression: Correlation and Regression	Ch. 9 & 10	Regression Lab	Repeated Measures ANOVA Assignment due beginning of lab
	W Mar 25					Final Paper Question Period	
	F Mar 27						
25	M Mar 30		Practice with Correlation and Regression	Multiple Regression	Ch. 11	NO LAB	
	W Apr 1		Multiple Regression				
	F Apr 3	Good Friday University Closed					
26	M Apr 6		Multiple Regression Continued			Critiquing Research Lab	Research Paper due at the beginning of CLASS on April 6 Regression Assignment due beginning of lab
	W Apr 8						
	F Apr 10						

27	M Apr 13		Review			NO LAB	
	W Apr 15	Winter Term Lectures End. Last day to withdraw from full courses and Winter Term half courses.	EXAM 6	All material since Exam 5			
	Apr 18- 29	Winter Term Final Examinations.					

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

It is the student's responsibility to request academic accommodations. If you are a student with a documented disability who may require academic accommodation and have not registered with the Disability Resource Centre, please contact their office at 403-220-8237. 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 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.

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 except under exceptional circumstances. Students are advised to wait until the final examination schedule is posted before making any travel arrangements.

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 via the Department Office (Admin 255), 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 an individual's final grade. **To get 2%** added to the final grade in a full-year course, like this one, you have to acquire **a total of 4 bonus credits** towards the course. These credits may be acquired in the Fall and/or the Winter Session. 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 **April 15, 2015**

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 170 and may be contacted at 403-220-5567.

Student Union VP Academic: Phone: 403-220-3911

suvpaca@ucalgary.ca

Student Union Faculty Rep.: Phone: 403-220-3913

socialscirep@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.su.ucalgary.ca/services/student-services/student-rights.html>).

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 (Full Courses)

The last day to drop this course with no "W" notation and **still receive a tuition fee refund** is **Friday, September 19, 2014**. Last day for registration/change of registration is **Monday, September 22, 2014**.

The last day to withdraw from this course is **April 15, 2015**.