UNIVERSITY OF CALGARY

DEPARTMENT OF PSYCHOLOGY
Faculty of Arts

PSYC 411	Design and Analysis in Psychological Research	Winter 2019

Instructor:	Dr. Mark Holden	**Lecture Location:**	SH 278
Phone:	403-210-9552	**Lecture Days/Time:**	MWF 9:00 – 9:50 am
Email:	mark.holden@ucalgary.ca	**Lab Info:**	SS 018
Office:	Admin 214		M/F: 10:00 -11:50 am
Office Hours:	By appointment	**TA Info:**	TBA

Course Description

This course builds on the foundation of Psyc 312 – Experimental Design & Quantitative Research Methods in Psychology – by introducing students to numerous statistical methods and experimental design considerations that are frequently encountered in Psychological Research. The aim of this course is to provide students with an overview of different design considerations or methods that they are likely to encounter, whether through their own research or when evaluating research by other psychologists. These skills are useful for psychology majors, those considering graduate studies in psychology, or even those who simply wish to be better consumers of research.

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

Because this course seeks to introduce students to various statistical procedures, there is a laboratory component in which students will gain direct experience with these methods. This experiential learning (learning by doing) component of the course will therefore be integrated with the lecture material, as a way of reinforcing the concepts discussed in class.

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	Assessment Methods	PLO(s)	Level(s)
Interpret and evaluate psychological research – including interpreting graphical depictions of data, critically assessing statistical methods, and drawing appropriate conclusions.	Exams, Lab assignments	2, 3, 4, 5, 7	A
Identify and apply the appropriate quantitative analysis techniques required to address questions in psychological research or to help inform or generate solutions to personal, social, and/or societal problems.	Exams, Lab assignments	2, 3, 4, 7	A

Input, organize, and manipulate data, and conduct statistical analyses using statistical software (or by hand)	Exams, Lab assignments	3	A
Describe the advantages, limitations, and assumptions of different research and/or statistical methods and apply these methods to real-world problems (e.g. scenarios given in lab assignments).	Exams, Lab assignments	2, 3, 4, 7	A
Communicate psychological research findings effectively, to both scientific and non-scientific audiences, including the appropriate and effective use of figures, graphs, and tables (and APA style)	Exams, Lab assignments	3, 4, 5	A

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

Psyc 312 (A and B) – Experimental Design and Quantitative Research Methods in Psychology
OR Psyc 300 and 301 – Research Methods and Data Analysis in Psychology I and II

AND admission to either the Psychology major or Honors Program

Required Text

Field, A. (2017). *Discovering statistics using IBM SPSS statistics* (5th North American ed.). London: Sage Publications Ltd.

The textbook is available in the bookstore, and a copy should be available on Reserve in the Taylor Family Digital Library. Alternatively, students may be able to find a copy of the previous (4th) edition, or an e-book online.

Classroom Expectations

Design and Analysis in Psychological Research is sometimes found to be a rather challenging course, no matter the university. I will try my absolute best to make this material and understandable and transparent as possible, and to make sure that no-one gets lost in the process. I will note, though, that any classroom – no matter the size – can generate a fair amount of confusion and noise. So, to help me in my mission of being understandable and clear for all students, I have devised a few simple guidelines that I hope will help to keep the confusion to a minimum, and provide a reasonably quiet learning environment for *all* students. I have included a set of expectations for both the students as well as for myself, below. In general, these all boil down to one simple rule, though: **I expect us all to be respectful of one another, and for each of us to do our part in making this a safe, comfortable learning environment for *everyone*.** By creating and maintaining a civil classroom atmosphere – in which members of the class treat each other with mutual respect – we establish a classroom in which attention and energy is focused on teaching and learning, rather than on frustration, conflict, and distrust.

<u>Expectations of Students</u>

- **To be punctual, prepared, and attentive during class**
    - Lecture will start at 11:00 a.m. Please be sure to be in your seat and ready for class by this time. If you absolutely cannot avoid being late, please enter the room as quietly as possible and minimize the disruption for your fellow students. If necessary, sit in the first available seat and try to find your friends at the break.

- **To stay in class (and not begin packing bags) until dismissed**
    - Please refrain from packing up as I begin to wind down a class. Oftentimes, at the end of class I have an important announcement about readings to be omitted, assignment deadlines, and so on. Packing up, or shuffling up and down the aisles causes a great deal of distraction, and may result in you or your fellow students missing these important announcements.

- **To make every effort not to be a distraction to students around you**
    - In some cases, students are not even aware of how distracting certain activities are. Obvious examples include talking on a cell phone, or with a neighbor. Less obvious examples include texting, or checking social media on one's laptop. These are incredibly distracting behaviors for everyone behind or near you. Please refrain from doing so until the break. Also, I would request that cell phones be turned off during class lecture (except at breaks).

- **To be willing to participate positively and constructively during class**
    - As outlined above, active participation is a critical component to my teaching style, and improves student learning and retention of material. Acting bored or dismissive is disrespectful to both the instructor and to your fellow students.

- **To treat all other students in the class, as well as the instructor, with respect**
    - We are very lucky to have a diverse population of students at the U of C, who come from different backgrounds and bring different experiences with them. These differences are a valuable means by which we will learn about individual and group differences. I will insist that all of us treat those students who are willing to share their thoughts and experiences with our full respect and attention. Avoid disrespectful comments, tones of voice, or facial expressions.

- **To understand and abide by the procedures and regulations outlined in the syllabus**

Expectations of the Instructor

- **To be punctual, prepared, and enthusiastic during class to facilitate student learning**
    - As I mentioned in the opening note on the syllabus, I love this course. I will always come to class prepared and happy to be teaching you.

- **To treat all students with dignity, respect, and fairness in order to provide a class structure that encourages learning**
    - Teachers who are disrespectful to students need to find another occupation. Seriously. A proper learning environment is one in which students feel safe to share their thoughts, experiences, or questions. Therefore, I have always treated my students with dignity, respect, and fairness. I do not play favorites, and I *never* belittle my students. I know that it is a bit daunting to raise your hand and share your personal experiences in class. As such, I hold *all* my students in high esteem, regardless of how well they perform in my classes, and I try my best to communicate this to them through both my words and my actions.

- **To grade objectively, consistently, and to return grades in a timely manner**
    - Again, I do not play favorites. In an attempt to keep marking from being subjective, all written materials are marked using a rubric (grading scheme) which is applied fairly and consistently to all students. The grading time may vary with time of year and the type of assignment. However, you will always have your assignment grades returned in as timely a manner as possible.
- **To be genuinely concerned about and interested in student learning and performance, and to be sensitive to student needs or concerns**
    - I always want my students to succeed. I do not provide "easy bonus marks" but I will readily try to help any student with *any* aspect of the course that they are struggling to understand. If special circumstances arise that might adversely affect your course performance, please let me know as soon as possible. I can't help if I don't know about it.
- **To understand and abide by the procedures and regulations outlined in the syllabus**

Asking Questions During Class

Asking questions during lecture is an extremely important part of learning. I strongly encourage you to ask a question whenever you require clarification on an issue, or have an observation to make yourself. Sometimes, though, we may have so many questions or comments on a particular topic that I will need to limit the amount of time we spend on that topic, so that we can cover the required material. If this is the case, please make sure to either send your question via e-mail, or use the "question box" provided.

Note: Routine questions such as "Where is the exam?" or "What chapters are covered for the midterm?" (and so on) may already be addressed on the course website and are listed in the tentative Lecture Schedule.

Assessment Methods

Midterm Exam 1 (25%) *Covers all class material from Jan 11 – Feb 8* 40 points, multiple choice and short answer questions	**February 11th, 2019**
Midterm Exam 2 (25%) *Covers all class material from Feb 13 – Mar 15* 40 points, multiple choice and short answer questions	**March 18th, 2019**
Final Exam (32%) *Covers all class material, with emphasis on material after Nov 19* 50 points, multiple choice and short answer questions	To be scheduled by the Registrar

Laboratory Assignments (18%)
Several lab assignments will be due during the course of the semester.
For more information on the topics, due dates, and more, please see below
Students must achieve a passing grade in both the class and lab components to pass this course.

Extra Information about Exams:

The use of computers, graphing calculators, iPads, phones, or any other programmable technology is NOT permitted during the exams. A simple non-programmable calculator may be used for calculation questions.

Study aids (e.g. books or notes) are also NOT permitted during exams, apart from any that may be provided by your instructor.

Short answer questions must be answered in the exam booklet provided by the instructor.

Extra Information about Lab Assignments:

Lab assignments must be handed in by the beginning of lab (within 10 minutes) on the day that they are due.

All assignments will be handed in at the beginning of the following lab, unless otherwise specified on the course outline.

Without approved documentation, late lab assignments will receive a penalty of 20% per day late (including weekend days), up to a maximum of 4 days late. After this time, the assignment will receive a grade of 0.

There are 9 lab assignments over the course of the semester. When calculating your final grade, of which assignments are worth 18%, **the 9 assignments will count equally toward the 18% component (i.e. 2% per lab).**

Lab Topics:

Note: Dates for labs, and due dates for the lab assignments may be found below, included in the Lecture Schedule.

Lab 1: Refresher on SPSS, Critical Thinking, Defining Variables
Lab 2: Experimental and Non-Experimental Research Methods
Lab 3: T-tests, Effect Sizes, and Power Analysis
Lab 4: Oneway and Factorial ANOVA
Lab 5: Contrasts in Oneway and Factorial Designs
Lab 6: Within-Subjects ANOVA
Lab 7: Correlations and Partial Correlations
Lab 8: Regression
Lab 9: MANOVA

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

Topics will be covered in the following order during the year. **Approximate** lecture dates are given, but the timing may be adjusted if more (or less) time is needed on a particular topic. Topics of the labs are also found below, as well as due dates for all assignments.

Date	Topic	Lab Topic	Assignment
F Jan 11	*MWF Lectures Begin.* Introduction to Psyc 411		
M Jan 14	Review: Critical Thinking, Defining and Measuring Variables		
W Jan 16			

R Jan 17	*Last day to drop Winter Term half courses.*		
F Jan 18	Correlational and Experimental Methods *Last Day to Add or Swap Winter Term half-courses. Last day for change of registration from audit to credit or credit to audit.*	Lab 1: Refresher on SPSS, Critical Thinking, and Defining Variables	
M Jan 21	Correlational and Experimental Methods		
W Jan 23	Reliability and Validity		
F Jan 25	T-tests (review), Cohen's d *Fee payment deadline for Winter Term fees.*	Lab 2: Non-experimental Research Methods	**Lab Assignment 1 due (day of lab)**
M Jan 28	Hypothesis Testing ▪ Type I and Type II Error rates ▪ Power Analysis		
W Jan 30	Replication Crisis: ▪ Problems with NHST ▪ P-hacking ▪ HARKing		
F Feb 1		Lab 3: T-tests, Effect Sizes, Power Analysis	**Lab Assignment 2 due (day of lab)**
M Feb 4	Replication Crisis Cont'd (with solutions)		
W Feb 6	Between-Subjects One-Way ANOVA		
F Feb 8		No Lab (Exam 1)	
M Feb 11	**Midterm Exam 1 (25%)**		
W Feb 13	Between-Subjects Factorial ANOVA	No Lab (Exam 1/ Reading Week)	
F Feb 15			**Lab Assignment 3 due (for both labs *HAND IN ONLINE*)**
Feb 17-24	***Reading Days. No lectures. University Open (except Family Day)***		
M Feb 18	***Alberta Family Day, University Closed*** *(except Taylor Family Digital Library, Law, Medical, Gallagher and Business Libraries).* ***No lectures.***		
M Feb 25	*Exam review*	Lab 4: One-way and Factorial ANOVA	
W Feb 27	Planned & Post-Hoc Contrasts (Between-Subj) ▪ Orthogonality ▪ Built-in Contrasts (SPSS) ▪ Polynomial Contrasts ▪ Custom Contrasts ▪ Effect Sizes of Contrasts		
F Mar 1			
M Mar 4	Planned & Post-Hoc Contrasts Cont'd	Lab 5: Contrasts in One-way and Factorial ANOVA	**Lab Assignment 4 due (day of lab)**
W Mar 6	Contrasts for Factorial Designs		
F Mar 8			
M Mar 11	Within-Subjects ANOVA	Lab 6: Within-Subjects ANOVA	**Lab Assignment 5 due (day of lab)**
W Mar 13			
F Mar 15	Correlations (review)		
M Mar 18	**Midterm Exam 2 (25%)**	**Chapters 5-8**	
W Mar 20	Correlations ▪ Pearson	NO LAB (Midterm 2)	
F Mar 22	▪ Biserial		

	▪ Partial and Semi-Partial	Lab7:Correlation & Partial Correlation	**Lab Assignment 6 due (day of lab)**
M Mar 25	*Exam review*		
W Mar 27	Regression ▪ Simple Regression		
F Mar 29		Lab 8: Simple Regression	**Lab Assignment 7 due (day of lab)**
M Apr 1	Regression ▪ Multiple Regression		
W Apr 3			
F Apr 5	MANOVA & Discriminant Analysis	Lab 9: MANOVA	**Lab Assignment 8 due (day of lab)**
M Apr 8	MANOVA & Discriminant Analysis cont'd		
W Apr 10			
F Apr 12	*Winter Term Lectures End. Last day to withdraw from full courses and Winter Term half courses.*		**Lab Assignment 9 due (for both labs *HAND IN ONLINE*)**
Apr 15-27	***Winter Term Exam Period.***		

Reappraisal of Graded Term Work **http://www.ucalgary.ca/pubs/calendar/current/i-2.html**

A student who feels that a piece of graded term work (term paper, essay, test, etc.) has been unfairly graded, may have the paper re-graded as follows. The student shall discuss the work with the instructor **within fifteen days** of being notified about the mark or of the item's return to the class. If not satisfied, the student shall **immediately** take the matter to the Director of Undergraduate Studies who will arrange for a reassessment of the work **within the next fifteen days**. Students in faculties without a departmental structure should take the matter to the dean or the associate/assistant dean (Academic/Student Affairs) of the faculty offering the course. The result of that reassessment should be given to the student in writing. ***The reappraisal of term work may cause the grade to be raised, lowered or to remain the same.***

Reappraisal of Final Grade http://www.ucalgary.ca/pubs/calendar/current/i-3.html

In the reappraisal of a final grade, the only element that will be considered is the grading of the final assessment that makes up the final mark (e.g., final examination, final project, final paper). An exception may occur when the Instructor of Record evaluates a piece of graded term work at the end of the term; that grade may also be considered in a reappraisal of final grade.

A student wishing a reappraisal of a final grade should first attempt to review the final assessment with the department or faculty offering the course. After which, the student shall obtain a Reappraisal of Final Grade form from ucalgary.ca/registrar (under Student Forms). Students must indicate exactly what error was made in marking the final assessment and/or in computing the final grade. The reappraisal will only be considered if the student provides a detailed rationale that outlines where and for what reason an error is suspected.

Students wishing a reappraisal of a final grade (excluding Law courses) must submit their request by the following dates:

Fall Term – March 1
Winter Term – June 30
Spring Intersession – August 15
Summer Term – October 15

Supplemental Examinations: 30 calendar days from the date the examination was written
The reappraisal form shall be submitted to Enrolment Services who will forward it to the department head or dean of the faculty offering the course. Reappraisals of final grades are dealt with by the head of the academic unit in consultation with members of academic staff. Normally, the department/faculty will respond to a reappraisal request within thirty calendar days of its initiation. After the reappraisal is completed, the department shall return the form to the Registrar's Office who shall inform the student in writing of the decision. ***Students should be aware that the grade being reappraised may be raised, lowered or remain the same. A student may request a reappraisal of final grade only twice in one academic year (September 1 – August 31).***

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 http://www.ucalgary.ca/pubs/calendar/current/k-5.html.

Academic Accommodations

The student accommodation policy can be found at: ucalgary.ca/access/accommodations/policy. Students needing an Accommodation because of a Disability or medical condition should communicate this need to Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities ucalgary.ca/policies/files/policies/student-accommodation-policy.Students needing an Accommodation based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to the instructor.

Seating During Exams

Instructors and exam invigilators are free to ask students to move seats before an exam begins or even during an exam. Students must comply with this request and refusal to do so may warrant a charge of academic misconduct.

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-and-course-information#mues. 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.

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. Students with an exceptional extenuating circumstance (e.g., a family emergency) should contact the Department of Psychology (psyugrd@ucalgary.ca).

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.

Acknowledgments and Respect for Diversity

Our classrooms view diversity of identity as a strength and resource. Your experiences and different perspectives are encouraged and add to a rich learning environment that fosters critical thought through respectful discussion and inclusion. The Department of Psychology would also like to acknowledge the traditional territories of the people of the Treaty 7 region in southern Alberta. The City of Calgary is also home to Métis Nation of Alberta, Region III.

Wellness and Mental Health Resources

The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the excellent mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, https://www.ucalgary.ca/wellnesscentre/services/mental-health-services) and the Campus Mental Health Strategy website (http://www.ucalgary.ca/mentalhealth/).

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 **January 17, 2019**. Last day to add a course is **January 18, 2019**. The last day to withdraw from this course is **April 12, 2019**.