



PSYC 312 Experimental Design and Quantitative Methods in Psychology SS 2016

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Lecture Location: ST 131
Lecture Days/Time: TR 8:00 – 10:45 AM

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 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 417) 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

Math 30 or 31 or Mathematics II and Psyc 205 – Principles of Psychology

Required 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 (70% 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 7, 2016 | 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 30, 2016 | Choosing the Best Measures, 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 19, 2016 | 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 16, 2016 | 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, |

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| | | Multiple Regression |
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Lab components (30% of final grade).

Report. A typed, double-spaced, scientific report based on a study to be conducted during lab. The final version, worth 10% of your mark, is due at the beginning of lab on August 9 or 11 (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 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:

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| 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: One-Way 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% |
| 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

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|----|---------|----|--------|----|--------|----|--------|
| 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

| Week | Date | Topic | Text Material | Lab Topic | Lab Assignment Due |
|------|---------|------------------------------------|---------------|-------------------------------------|--------------------|
| 1 | M May 9 | <i>Spring term lectures begin.</i> | Ch. 1 and 2 | No lab (due to first week of | |

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| | T May 10 | Introduction to the Course and the Science of Psychology | | the spring term) | |
| | R May 12 | The Role of Statistics in Research and Ethics | | | |
| | F May 13 | <i>Last day to change spring registration</i> | | | |
| 2 | T May 17 | Research ideas and Hypotheses and Selecting Measures | | Conducting a Literature Search, Writing Research Papers in APA format, and Avoiding Plagiarism | |
| | R May 19 | Measuring and Manipulating Variables and Non-Experimental Methods I | | | |
| 3 | T May 24 | Non-Experimental Methods II and III | | No lab (due to school cancellation for Congress) | |
| | R May 26 | Congress – No Classes | | | |
| 4 | T May 31 | Congress – No Classes | | | |
| | R June 2 | Congress – No Classes | | | |
| 5 | T June 7 | Exam 1 | | Observational Research | Literature Search Assignment due at the beginning of lab |
| | R June 9 | Internal Validity and Alternative Research Designs | | | |
| 6 | T June 14 | Plotting Data and Measures of Central | Ch. 3 and 4 | Survey Research Part I: Survey | Observational Research Lab Assignment |

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| | | Tendency | | Development | due at the beginning of lab |
| | R June 16 | Measures of Variability and The Normal Distribution | Ch. 5 and 6 | | |
| 7 | T June 21 | Practice with z-scores and Probability | Ch. 7 | Putting Together a Poster and Survey Research Part II: Data Analysis | |
| | R June 23 | Hypothesis Testing Part I and II | Ch. 8 | | |
| 8 | T June 28 | Review for Exam 2 | | Poster Session, Participate in an online study, and Outline of final research paper | Poster and Survey Research Assignment due at the beginning of lab |
| | R June 30 | Exam 2 | | | |

| Week | Date | Topic | Text Material | Lab Topic | Lab Assignment |
|------|-----------|---|-------------------|-----------------------------------|---|
| 1 | T July 5 | The One-Sample t-test and Confidence Limits on the mean | Ch. 12 | Independent Samples t-tests | |
| | R July 7 | Experiments with Two Groups: The t-test for Independent Groups and the Wilcoxon Rank Sum Test | Ch. 14 and Ch. 20 | | |
| 2 | T July 12 | Power and Experiments with More than Two Groups: One- | Ch. 15 and Ch. 16 | One-Way ANOVA: Analyze Experiment | Independent Samples t-test Assignment due at the beginning of |

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| | | Way ANOVA | | | lab |
| | R July 14 | Experiments with More than Two Groups: Multiple Comparisons and Review for Exam 3 | Ch. 16 | | |
| 3 | T July 19 | Exam 3 | Ch. 17 | Factorial ANOVA and Paired t-tests | Draft of Research Paper Intro and Method due at the beginning of lab |
| | R July 20 | Factorial Designs | Ch. 17 | | |
| 4 | T July 26 | Between-Subjects Factorial ANOVA | | Repeated Measures ANOVA and Regression | Factorial ANOVA and Paired t-test Assignments due at the beginning of lab |
| | R July 28 | Within-Subjects Designs: The Paired t-test and the Wilcoxon Signed Rank Test | Ch. 13 and 20 | | |
| 5 | T Aug 2 | Repeated Measures ANOVA | Ch. 18 | Q and A about final research paper (can be used as a work period) | Repeated Measures and ANOVA and Regression Assignments due at the beginning of lab |
| | R Aug 4 | Chi-Square | Ch. 19 | | |
| 6 | T Aug 9 | Correlation and Regression | Ch. 9 and 10 | Critiquing Research | Research Paper due at the beginning of lab |
| | R Aug 11 | Multiple Regression and Review | Ch. 11 | | |

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| 7 | T Aug 16 | Exam 4 | | No lab (due to end of term) | |
| | W Aug 17 | <i>Summer Term Lectures End. Last day to withdraw from full session Summer Term courses.</i> | | | |

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 date, 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. 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 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 (2) 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 June 30th, 2016.

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

suypaca@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.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** and the last day for registration/change of registration is **May 13, 2016**. The last day to withdraw from this course is **June 30, 2016**.