UNIVERSITY OF CALGARY

Department of Psychology
Psychology 411 (L01) – Design and Analysis in Psychological Research
Fall 2008

Instructor:	**Dr. S. D. Boon**	**Lecture Location:**	**SH288**
Phone:	403-220-5564	**Lecture Days/Time:**	12:00-12:50
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Office:	A231B		
Office Hours:	TBA		

Teaching Assistant	**David Kraichy**		
Lab B01 Day/Time:	T 13:00	**Location:**	SS018
Lab B02 Day/Time:	W 17:00	**Location:**	SS018

Course Description and Goals
Calendar Description: Experimental design problems and techniques for analysis of psychological data. **Prerequisite: Psyc 312**

Course Objectives: This course is designed to present the theoretical and mathematical foundations of the General Linear Model (GLM) and explore how statistical procedures commonly used in psychological research are subsets of the model. Subsets of the GLM to be considered are: (a) Linear and multiple regression, including direct and hierarchical procedures; (b) Mixed models involving both categorical and continuous independent variables; (c) Planned Comparisons; (d) Analysis of Covariance (ANCOVA); (e) Multivariate Analysis of Variance (MANOVA) and (f) Discriminant Function Analysis.

Learning Goals: Upon completion of this course, students should:
- Have a firm conceptual and mathematical grasp of the General Linear Model (GLM).
- Understand how specific analytical techniques are derived from the GLM.
- Be able to run a variety of univariate and multivariate analyses using the SPSS statistical package.
- Be able to critically read and review empirical papers published in scholarly journals with respect to analytic procedures.
- Know how to analyze and interpret statistical interactions.
- Understand the basics of planned comparisons and Analysis of Covariance (ANCOVA).
- Understand the basics of multivariate analysis including the concepts of eigenvalues and eigenvectors.

Required Text
No required text. Set of handouts available for purchase from the Psychology Undergraduate Students' Association (PSYCHS) in Admin. 170. **Additional, supplementary readings are available for photocopying (at your cost) from my office if you feel a need to have reference materials.**

Evaluation

Course Component	Weighting	Due Date
Research mini-assignment	10%	October 17, 2008
Midterm exam	30%	November 5 and 7, 2008
Final exam	30%	To be scheduled by registrar
Laboratory	30%	Five equally-weighted (6% each) written assignments due throughout term See lab outline

Research Mini-assignment:
The purpose of this assignment is to give you experience (a) generating hypotheses for a research question on a given topic and (b) identifying the analytic strategy appropriate to testing those hypotheses.

For this assignment, you will:

- read at least five (5) journal articles on the topic of forgiveness (I have selected this topic to ensure that it DOES NOT relate to any thesis or thesis-like research you may be doing to satisfy the requirements of your honours degree or any conference course you may be taking and because I'm familiar with the research in this area; in the event that this topic does relate to your thesis research, you must arrange a meeting with me to determine an alternative topic)
- identify one or more research questions that you might explore on this topic and appropriate, testable hypotheses that would allow you to test specific predictions of interest to you in relation to this research question or questions
- design a study to test these hypotheses
- describe the type of analysis you would perform to test your hypotheses and justify/explain your choice

You will prepare a brief, **5-page double-spaced paper** that presents the results of your work on this assignment. It should be typed in APA format and include references for the 5 papers you have consulted. Note that **I will not accept papers submitted electronically by any means, nor will I grade pages over the 5-page limit**. Be sure the paper includes:

- a brief rationale that explains why your research questions/hypotheses are worthy of examination. This rationale should incorporate a brief review of the 5 papers you read
- a clear discussion of your hypotheses and the logic that lies behind them (i.e., why you are predicting what you are predicting, based on the results/theory from the 5 papers you read)
- a brief but clear description of the design of your study
- a statement identifying the type of analysis you would perform if you were to actually perform this study
- an explanation as to why this type of analysis is appropriate to testing your hypotheses. **NOTE; The hypotheses you generate for this assignment MUST be testable using the kinds of analyses discussed in this course. In other words, do not propose to test hypotheses that cannot be tested using simple regression, multiple regression, ANOVA, ANCOVA, mixed model regression, discriminant function analysis, or MANOVA**

Assignments are due at the beginning of class October 17, 2008. Late assignments will be subject to a 5% penalty per day, including weekends.

IMPORTANT NOTE: This assignment is due approximately half way through the term and we will not have covered all of the various kinds of analyses to be discussed in this course by that point in time. Accordingly, your knowledge of and familiarity with some of the more advanced analyses that we will discuss later in the term may be limited to an understanding of the kinds of variables that are involved in each. This does not necessarily preclude the option of generating hypotheses that would most appropriately be tested using these techniques, though it might require that you read ahead in the optional, supplementary course readings and/or meet with me to discuss your ideas. We will briefly discuss the differences among these various analyses and the GLM approach to these analyses during the first few days of classes so that, at least in theory, you could propose to use any of them and be prepared to explain why (as I hope you will learn from this assignment, the choice isn't really that hard. The details of your method and hypothesis will for the most part determine your choice).

You will be graded on:

- your ability to generate theoretically interesting and testable hypotheses and to justify the importance/value of those hypotheses
- your understanding of the methodological details/constraints that determine the kind of analysis that is appropriate to testing these hypotheses
- your explanation as to why the particular analytic technique is appropriate, based on your understanding of the methodological constraints at play in the design of your hypothetical study and the nature of your hypotheses

Exams:

Exams will consist of both **short-answer** and **computation questions**. The midterm will be in two parts, written in two consecutive classes. It will cover the material up to and including then end of multiple regression. The final exam will be CUMULATIVE.

The use of calculators and/or portable computing machines is permitted for exams in this course. However, you will be graded on your work. Accordingly**, if you fail to show your work, you will receive a 0 for the question (or computation component of the question) even if the answer is correct.**

Laboratory:

Laboratory attendance is **mandatory**. You must pass the laboratory component of this course to pass the course. A separate lab outline will be given out during the first lab.

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 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 (i.e., 89.5% will be rounded up to 90%; 89.4% will be rounded down to 89%, etc.).

Tentative Topic Outline and Readings

DATE		Optional Supplemtary Readings
Sept. 8 - 12	**Introduction and overview**. Review of GLM basics.	
Sept. 15-19	Introduction to **regression analysis**	Ch. 2 Pedhazur
Sept. 19	**Last day for registration and change of registration. No fee refunds for withdrawals after this date.**	
Sept. 22-26	Regression analysis cont'd	Ch. 3 Pedhazur
Sept. 29–Oct. 3	Regression analysis cont'd	
Oct. 6-10	Regression analysis cont'd	
Oct. 13	***No classes – Thanksgiving***	
Oct. 15-17 **Oct. 17**	**ANOVA** **RESEARCH MINI-ASSIGNMENT DUE (beginning of class)**	
Oct. 20-24	ANOVA cont'd	
Oct. 27-31	Planned comparisons	
Nov. 3 **Nov. 5, 7**	Review **MIDTERM EXAM (two parts, over two days)**	
Nov. 8-11	***Reading Days—no classes***	
Nov. 12 -14	**Mixed model regression/ANCOVA**	Ch. 15 Pedhazur
Nov. 17-21	**Multivariate Analysis of Variance** (MANOVA)	Ch. 15 Diekhoff
Nov. 24-28	**Discriminant function analysis** (DFA)	Ch. 14 Diekhoff
Dec. 1-5	Review	
Dec. 4	***Last day to allocate Research Credits to Fall Session half courses***	
Dec. 8-17	***Fall Session Final Examinations***	

N.B. The above schedule and procedures in this course are subject to change in the event of extenuating circumstances.

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. 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 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
Make-up exams are NOT an option without an official University medical excuse (see the University Calendar). You must contact the instructor before the scheduled examination or you will have forfeited any right to make up the exam. At the instructor's discretion, a make-up exam may differ significantly (in form and/or content) from a regularly scheduled exam. Except in extenuating circumstances (documented by an official University medical excuse), a makeup exam is written within two (2) weeks of the missed exam. A completed Physician/Counselor Statement will be required to confirm absence from a test for health reasons. The student will be required to pay any cost associated with the Physician Counselor Statement.

Course Credits for Research Participation
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 **December 4, 2008.**

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 220-5567.
Student Union VP Academic: Phone: 220-3911 suvpaca@ucalgary.ca
Student Union Faculty Rep.: Phone: 220-3913 socialscirep@su.ucalgary.ca

Important Dates
The last day to drop this course and still receive a fee refund is **September 19, 2008**. The last day to withdraw from this course is **December 5, 2008**.