

SYLLABUS (FALL 2016)

PSYC 400A: *Advanced Statistical Methods: The General Linear Model*

Instructor: Dr. John Sakaluk (sakaluk@uvic.ca)

Days/Time: Monday/Thursday: 11:30AM– 12:50PM

Office/Office Hours: Cornett A240/Thursdays 1:30PM-2:30PM (or by appointment)

Required Texts:

1. Field, A., Miles, J., & Field, Z. (2012). [*Discovering Statistics Using R*](#). Thousand Oaks, CA: Sage.
 2. Assorted assigned readings from articles/chapters
- *In addition to your textbook, I will post periodic readings from important articles/textbook chapters. Content from these readings is fair-game for tests.*

Required Software:

1. R: <http://cran.stat.sfu.ca>
- R is the primary data-analysis software we will be using for the course. It is free, and works on both Windows and Mac computers. There will be computers in our classroom (a computer lab) with all necessary software already installed, but if you would prefer to work on your own laptop, click the appropriate “Download and Install R” link, depending on your operating system, and the install the software from the downloaded file.
 - 2. R Studio: <https://www.rstudio.com/products/rstudio/download2/>
- While R will be our primary statistics workhorse, it is not a very pretty program. R Studio is a free (and Windows-/Mac-friendly) supplemental program, that dresses R up a bit to make it more user-friendly and functional. Again, our lab computers will have it installed, but if you plan to work from your own computer, definitely download and install it.

Recommended Software:

1. G*Power: <http://www.gpower.hhu.de/en.html>
- Another free program that is Windows- and Mac-friendly (see a theme here?...). Don’t worry about understanding what “power” is right now, but this is a program that is very helpful for performing power-related calculations.

Required Equipment

You will need a non-graphing scientific calculator for hand-calculations. Other calculating devices (e.g., smartphones, graphing calculators) **will not be permitted for use during tests.**

Course Description

Psychologists of all description—social, clinical, cognitive, developmental, and others—must possess a sufficient mastery of statistics, for the purposes of conducting their own research, and evaluating others’. The *general linear model* encapsulates a broad array of data analysis techniques, and is typically considered the foundation of statistical training for psychologists. In

our class, you will be learning to understand these analyses—and other important statistical principles—conceptually, as well as learning how to conduct, interpret, and report these analyses yourself.

Evaluation and Grading Policy

Item	Date	Points	% of Grade
Data Camp R Tutorial	September 30	67	10
Lab Assignment 1 ^a	Thurs, October 6	25	3.75
Lab Assignment 2 ^a	Thurs, October 20	25	3.75
Lab Assignment 3 ^a	Mon, October 31	25	3.75
Lab Assignment 4 ^a	Thurs, November 3	25	3.75
Lab Assignment 5 ^a	Mon, November 14	25	3.75
Lab Assignment 6 ^a	Mon, November 21	25	3.75
Lab Assignment 7 ^a	Thurs, November 24	25	3.75
Lab Assignment 8 ^a	Thurs, December 1	25	3.75
Lab Assignments		200	30
Test 1	Mon, October 3	100	15
Test 2	Thurs, October 27	100	15
Test 3	Mon, November 7	100	15
Test 4	Thurs, December 1	100	15
Tests		400	60
Total		667	100

^a See description of “SPSS penalty” in Lab Assignments

The final letter grade in the course will be based on total percent score rounded to the third decimal point as shown: Final grades that end with a decimal point of 0.5 or above will be rounded to the next higher whole number, and grades that end with a decimal point below 0.5 will be rounded to the next lower whole number. For example 89.5 to 89.9 is rounded up to 90% (A+), whereas 89.4 is rounded down to 89% (A).

A+ = 90 – 100	B+ = 77 – 79	C+ = 65 - 69	F = 0 - 49
A = 85 - 89	B = 73 – 76	C = 60 – 64	
A- = 80 - 84	B- = 70 – 72	D = 50 - 59	

Students are expected to familiarize themselves with the Important Course Policy Information (attached).

Data Camp R Tutorial (10%)

As many students will likely be mostly—if not totally—unfamiliar with using R, one of the first priorities of the class will be to get students comfortable with R syntax. [Data Camp offers an easy-to use online tutorial that will help to expose students to basics of R syntax and programming.](#) The tutorial covers working with *variables, vectors, matrices, factors, data frames, and lists*—all common elements of R syntax that should serve you well to be familiar with, both for this class, and well beyond. In total, the tutorial should take approximately 4 hours to finish.

Lab Assignments (30%)

There will be eight lab assignments to complete throughout the semester, due (generally) a week after they are assigned. **Assignments must be handed in during class; email submissions are not allowed.** Specific requirements for each lab assignment will be outlined in separate documents. However, they will generally require you to apply the analytic techniques learned during class to provided data, interpret these analyses, and write up a brief scientific report (~1-2 pages) of the analysis, akin to what would normally be presented in the “Results” section of a scholarly article.

As a major focus of the course is to expose you to *R*, I want students to complete these assignments using *R*. However, there is a normal learning curve to *R*, and sometimes you might find it takes more time and practice to fully understand how to apply a particular technique, than what you can afford for a particular assignment. Anticipating this possibility, lab assignments completed with SPSS, or some alternative statistical analysis software, will be accepted, but will be subject to an **SPSS Penalty** of 5 pts per assignment (resulting in a maximum possible grade of 20/25 for a given assignment).

Tests (60%)

There will be four tests (worth 15% each), covering the units of: (1) introduction/correlation; (2) simple regression models; (3) advanced regression models; and (4) t-tests/ANOVAs. Tests will consist of multiple choice, short-answer, calculation, and interpretation-based questions. **You will not be asked to produced original *R* syntax on any test, though questions testing your understanding of what certain commands do will be considered fair-game.** Calculators should be brought to class; no replacements will be provided.

Students who miss an in-class test will receive a mark of zero unless they have a case of documented illness or family emergency. Tests are to be made up within a week, if possible, otherwise a test will be dropped from a student’s grading scheme, and the other tests will be weighted more heavily.

Tentative Schedule of Dates*

**Topics/dates subject to change at my discretion pending class progress*

Week/Day		Date	Topic(s)	Reminders
1	Thursday	September 8	Course introduction	
2	Monday	September 12	GLM "Big Pictures", Fundamentals,	<ul style="list-style-type: none"> • <i>Field et al. (2012): Chapter 2</i> • Interpreting Confidence Intervals • Understanding Statistical Power and Significance Testing
	Thursday	September 15	Error-Control, Power, and Replicability	<ul style="list-style-type: none"> • <i>Simmons et al. (2011): False-positive psychology...</i> • <i>Bakker et al., (2016): Researchers' intuitions about power...</i> • <i>Open Science Collaboration (2015): Estimating the reproducibility of psychological science</i>
3	Monday	September 19	Correlations (Conceptual)	<ul style="list-style-type: none"> • <i>Field et al. (2012): Chapter 6</i> • Guess the Correlation • Interpreting Correlations
	Thursday	September 22	Away @ Conference	
4	Monday	September 26	Correlations (Testing by Hand)	
	Thursday	September 29	Introduction to R and Correlations (Testing and Plotting in R)	<ul style="list-style-type: none"> • Data Camp R Tutorial due
5	Monday	October 3	TEST #1 (Weeks 2-4)	
	Thursday	October 6	Bivariate Regression Models (Conceptual)	<ul style="list-style-type: none"> • Lab Assignment 1 due • <i>Field et al. (2012): Chapter 7 (pg. 245-261)</i>
6	Monday	October 10	THANKSGIVING MONDAY (NO CLASS)	
	Thursday	October 13	Bivariate Regression Models (Testing by Hand)	
7	Monday	October 17	Bivariate Regression Models (Testing and Plotting in R)	
	Thursday	October 20	Multiple Regression	<ul style="list-style-type: none"> • Lab Assignment 2 due

			and Hierarchical Regression Models (Conceptual)	<ul style="list-style-type: none"> • <i>Field et al. (2012): Chapter 7 (pgs. 261-311)</i>
8	Monday	October 24	Multiple Regression (Testing and Plotting in R)	
	Thursday	October 27	Test #2 (Weeks 5-8)	
9	Monday	October 31	Simple Mediation and Moderation, Models (Conceptual)	<ul style="list-style-type: none"> • Lab Assignment 3 due • <i>Hayes (2013) Chapter 4: The Simple Mediation Model</i> • <i>Hayes (2013) Chapter 7: Fundamentals of Moderation Analysis</i>
	Thursday	November 3	Simple Mediation and Moderation, Models (Testing and Plotting in R)	<ul style="list-style-type: none"> • <i>Bullock et al. (2010): Yes, But What's the Mechanism...</i> • Lab Assignment 4 due
10	Monday	November 7	Test #3 (Weeks 9-11)	
	Thursday	November 10	READING WEEK	
11	Monday	November 14	t-tests (Conceptual and testing/plotting by hand/in R)	<ul style="list-style-type: none"> • Lab Assignment 5 due • <i>Field et al. (2012): Chapter 9</i> • <i>Lakens (2013): Calculating and reporting effect sizes...</i>
	Thursday	November 17	Away @ Conference	
12	Monday	November 21	One-Way Analysis of Variance (Conceptual and testing by hand/in R)	<ul style="list-style-type: none"> • Lab Assignment 6 due • <i>Field et al. (2012): Chapter 10</i>
	Thursday	November 24	Repeated-Measured and Mixed ANVOA Interactions, and Analysis of Covariance (Conceptual)	<ul style="list-style-type: none"> • Lab Assignment 7 due • <i>Field et al. (2012): Chapters 12 and 13</i>
13	Monday	November 28	Repeated-Measured and Mixed ANVOA Interactions, and Analysis of Covariance (Testing and plotting in R)	<ul style="list-style-type: none"> • <i>Field et al. (2012): Chapters 11 and 14</i>
	Thursday	December 1	Test #4 (Weeks 12-13)	
			<ul style="list-style-type: none"> • Lab Assignment 8 due 	

UNIVERSITY OF VICTORIA
Department of Psychology

Important Course Policy Information

Commitment to Inclusivity and Diversity

The University of Victoria is committed to promoting, providing and protecting a positive and supportive and safe learning and working environment for all its members.

Policy on Academic Integrity including Plagiarism and Cheating

The Department of Psychology fully endorses and intends to enforce rigorously the Senate Policy on Academic integrity (<http://web.uvic.ca/calendar2016-09/undergrad/info/regulations/academic-integrity.html> , p. 55-58, UVic Calendar 2016-17). It is of utmost importance that students who do their work honestly be protected from those who do not. Because this policy is in place to ensure that students carry out and benefit from the learning activities assigned in each course, it is expected that students will cooperate in its implementation.

The offences defined by the policy can be summarized briefly as follows:

1. **Plagiarism.** You must make sure that the work you submit is your work and not someone else's. There are proper procedures for citing the works of others. The student is responsible for being aware of and using these procedures.
2. **Multiple Submission.** Only under exceptional circumstances may a work submitted to fulfill an academic requirement be used to satisfy another similar requirement. The student is responsible for clarifying this with the instructor(s) involved.
3. **Falsifying Materials Subject to Academic Evaluation.** This includes falsification of data, use of commercially prepared essays, using information from the Internet without proper citation, citing sources from which material is not actually obtained, etc.
4. **Cheating on Assignments, Tests, and Examinations.** You may not copy the work of others in or out of class; you may not give your work to others for the purpose of copying; you may not use unauthorized material or equipment during examinations or tests; and you may not impersonate or allow yourself to be impersonated by another at an examination. The Department of Psychology has a policy of not making old examinations available for study purposes. Therefore, use of old exams without the express written permission of the instructor constitutes cheating by the user, and abetting of cheating by the person who provided the exam.
5. **Being an Accessory to Offences.** This means that helping another student to cheat (for

instance, by showing or communicating to them answers to an assignment, or by allowing them to view answers on an exam) is an academic offence.

Instructors are expected to make every effort to prevent cheating and plagiarism. This may include the assignment of seating for examinations, asking students to move during examinations, requests to see student identification cards, and other measures as appropriate. Instructors also have available to them a variety of tools and procedures to check for Internet and electronic media-based cheating. In instances of suspected or actual plagiarism or cheating, instructors, following prescribed procedures, are authorized to take steps consistent with the degree of the offence. These measures will range from a zero on the test or assignment or a failing grade for the course, probation within a program to temporary or even permanent suspension from the University.

Rights of Appeal are described in the Policy on Academic Integrity in the University calendar (on p. 55-58 in 2016-17).

The definitive source for information on Academic Integrity is the University Calendar (p. 55-58 in 2016-17) (<http://web.uvic.ca/calendar2016-09/undergrad/info/regulations/academic-integrity.html>)

Other useful resources on Plagiarism and Cheating include:

1. The Learning Skills program: <http://www.coun.uvic.ca/learning/index.html>
2. The Ombudsperson's office: <http://www.uvss.uvic.ca/ombudsperson/pubsguides/plagiarism.pdf>