

Psychology 391
Advanced Data Analysis
Fall, 2007



Updated September 12th 2007

Class Time: Mondays & Wednesdays 2:30 - 3:50
Place: MC 2065
Instructor: Jonathan Fugelsang
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Office Hours: Monday & Wednesday 4:30 - 5:30, and by appointment.
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Teaching Assistants:

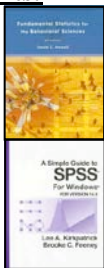
Jason Locklin
 Office: PAS 2246
 Office Hour: Thursday 9:30 - 10:30
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 Tutorial: 103 (Thursday 8:30 - 9:20)

Jennifer Tomaszczyk
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Emiko Yoshida
 Office: PAS 3044
 Office Hour: Tuesday 10:30 - 11:30
 Email: eyoshida@watarts.uwaterloo.ca
 Tutorial: 102 (Wednesday 5:30 - 6:20)

Texts:



Howell, D. C. (2008). *Fundamental Statistics for the Behavioral Sciences*. Thomson.

Kirkpatrick, L. A. & Feeney, B. C. (2006). *A simple guide to SPSS for Windows (For Version 14)*. Wadsworth.

Course Objectives:

This course builds from the material covered in Psychology 292. Topics that will be covered include: ANOVA, factorial ANOVA, repeated measures and mixed designs, and multiple comparisons associated with those designs. The primary goal of the course is to provide students with a solid understanding of both the logic and computations underlying many of the advanced statistical procedures that psychologists use when analyzing data collected from experiments. An additional goal for this course is that students will learn to perform these statistical analyses using SPSS.

Course Requirements:

Requirement	Date	Value
Test #1	October 10 th	25%
Test #2	November 7 th	25%
Test #3	December 3 rd	25%
Graded Labs (N=3)	Oct 3 rd (5%), Nov 12 th (10%) and 28 th (10%)	25%
Research Participation (or assignment)		Bonus 3%

Tests (75%):

In total, there will be three tests in this course. The dates for these tests can be found on the course outline. All three tests will be held during regular class period. The content of the tests will be a combination of short answer and long answer, and will involve both conceptual and computational material.

Labs (25%):

There will be three lab assignments in this course. The first lab will be worth 5%, and the remaining two will be worth 10% of your final grade each. As with all work in this course, you are to complete the assignments on your own. It is important that you show all of your work for each assignment (i.e., all calculations). All assignments will be due at the start of class and all late assignments will be penalized. Any assignments handed in after the start of the class in which it is due will be penalized as if it was one class late. For every class that an assignment is late, 25% will be deducted from your assignment grade. For example, if you received 100% on assignment 1 but handed it in one class late you would receive 75% on the assignment.

Research Participation (Bonus 3%):

Experiential learning is considered an integral part of the undergraduate program in Psychology. Participation in research is one example of this. A number of undergraduate courses have been expanded to include opportunities for Psychology students to volunteer as research participants enabling them to learn first-hand about psychology research and related concepts. Many students report that participation in research is both an educational and interesting experience.

Student participants in this class may earn up to 3 bonus percentage points towards their final mark in Psychology 391 by participating in studies conducted by students and faculty in the Department of Psychology (i.e., the maximum possible final grade is 103%). Participation is worth .5 participation credits (percentage points) for each half hour session. Researchers will record student's participation and will advise the course instructor of the total points earned by each student at the end of the term. Students who do not wish to participate in research may choose an alternative approach to earning the same number of points; this is explained below in "Alternative to participating in research". Please note that all Psychology studies have undergone prior ethics review and clearance through the Office of Research Ethics.

How do I sign up?

REG has created an account for you on SONA (REG web-based Study Sign-Up system) at <http://uwaterloo.sona-systems.com>. User ID is your Quest ID (eg. j2smith), temporary password is your Student ID (eg 2001234). Log in to your account, read/acknowledge the ORE "Human Subjects/Privacy Policy" then complete a very brief (5-10 minute) "Prescreen" questionnaire to provide basic demographic info. You won't receive a credit for this and you may decline if you wish however completing it will increase your eligibility for other studies. Once you have completed (or declined) the Prescreen questionnaire you should go to "My Profile" and enter your preferred (Alternate) email address. Then you can go to "Study Sign-Up" and select a Psych 391-eligible study that interests you and a day/time that fits your schedule. You'll receive a confirmation email and a reminder the day before the study. Upon completion of the study you are granted your Study Credit and given feedback about the study hypothesis, design and predictions. You can use this to complete the Experimental Write-Up (the professor will explain this).

When should I sign up?

Right away, the sooner the better! The On-line study "Mass Testing Survey F07" (one full credit) will only be offered for a few weeks and you should do this study as soon as possible. Researchers often select participants based on their responses and doing this survey increases your eligibility for other studies. Note that you can only do this survey if you have completed the Prescreen questionnaire. We'd appreciate it if you'd do both.

Are there any restrictions to the studies I can sign up for?

Yes ... i) the study must be eligible for a credit in this class (as noted in the study description) ii) only 2 of your 3 credits can be for On-line studies and iii) you should try to spread your participation out over the term. The last day to participate for credit is Dec 3. You can participate for pay anytime.

Where can I get more information, instructions, help with login problems etc?

REG website: <http://www.arts.uwaterloo.ca/~regadmin/regparticipant>
REG Coordinator: regadmin@watarts.uwaterloo.ca

Alternative to participating in research:

Students are not required to participate in research, and not all students wish to do so. As an alternative to participation in research, students may opt to review articles relevant to psychology and write a short 1-page review. Each review articles counts as one percentage point. I will provide some papers for you that you can review, or you can find your own to review. The review must:

- Be submitted by the scheduled class time on November 28th. No late papers will be accepted.
- Be typed

- Include title, author, source and date of the article. A copy of the article must be attached (only if it is not one of the articles provided).
- Identify the key statistical concepts in the article and indicate the pages in the text that are applicable.
- Clearly evaluate the application or treatment of those concepts in the article.

Students may complete any combination of a) participation in research or b) article review up to a total of 3% points.

Tutorials:

Each student should be registered in a tutorial section. Tutorials are intended to provide students with an opportunity to work through the mechanics of the statistical procedures with a TA in a smaller group setting, as well as give hands on experience with SPSS. For the most part, we will spend class time discussing the logic and rationale behind the statistical procedures covered in this course. The tentative tutorial schedule is posted on page 4 of this syllabus.

Nexus Accounts:

Because you will be required to complete portions of your lab assignments with SPSS, it is important that you obtain a NEXUS account. A NEXUS account will give you access to e-mail, the internet, and a host of different software packages (including SPSS which you will need for the lab assignments). The only cost incurred with a NEXUS account is printing. You can purchase printing at PAS 1080 using your WATCARD. It is strongly recommended that you activate your NEXUS account, find the SPSS statistical package, and become familiar with it. You can obtain a NEXUS account by: (a) going to a NEXUS computer (e.g., one located in PAS 1237), (b) clicking on the link in the bottom-left corner of the login browser, and (c) following the instructions as they are given on the screen.

Helpful suggestions to ensure your success in this (or any) class:

1. Read the chapter before coming to class.
2. Look over the lecture notes before coming to class.
3. Take additional notes to supplement the class notes that are provided (note: I often supplement the text and class note materials with examples that will only be provided during lectures).
4. If you have questions, please ask.
5. Be aware of the due dates.
6. After a chapter has been covered, see if you can complete the exercises at the end of the chapters.
7. Come by and visit me or the TA's during office hours.

Note for students with disabilities:

The Office for Persons with Disabilities (OPD), located in Needles Hall, Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the OPD at the beginning of each academic term.

Please be aware of the following university policies:

- All students registered in the courses of the Faculty of Arts are expected to know what constitutes an academic offence, to avoid committing academic offences, and to take responsibility for their academic actions. When the commission of an offence is established, disciplinary penalties will be imposed in accord with Policy #71 (Student Academic Discipline). For information on categories of offences and types of penalties, students are directed to consult the summary of Policy #71 which is supplied in the Undergraduate Calendar (section 1; on the Web at <http://secretariat.uwaterloo.ca/Policies/policy71.htm>). If you need help in learning how to avoid offences such as plagiarism, cheating, and double submission, or if you need clarification of aspects of the discipline policy, ask your TA or course instructor for guidance or consult "How to Avoid Plagiarism and Other Written Offences: A Guide for Students and Instructors" (<http://watarts.uwaterloo.ca/~sager/plagiarism.html>). Other resources regarding the discipline policy are your academic advisor and the Undergraduate Associate Dean.
- Students who believe that they have been wrongfully or unjustly penalized have the right to grieve. Please refer to Policy #70 (Student Grievance) at <http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm>

TENTATIVE LECTURE SCHEDULE

Days	Topic	Readings
Sept 10	Introduction to course	
Sept 12	Review of Basic Concepts	Chap: H 1, 2, 4, 5, 6, 8
Sept 17	Hypothesis Testing, T-tests & begin 1-way ANOVA	Chap: H 12-14, 16.1-16.2, K&F 1-9
Sept 19	ANOVA	Chap: H 16.1-16.2
Sept 24	ANOVA (Handout L1)	Chap: H 16.1-16.3, K&F 10
Sept 26	ANOVA	Chap: H 16.3-16.4
Oct 1	ANOVA	Chap: H 16.6-16.11
Oct 3	ANOVA (L1 due)	
Oct 10	Test # 1	
Oct 15	Multiple Comparisons: Background	Chap: H 16.5, S1, K&F 10
Oct 17	Multiple Comparisons: Planned comparisons	Chap: H 16.5, Sup 1
Oct 22	Multiple Comparisons: Post Hocs	Chap: H 16.5, Sup 1
Oct 24	Factorial ANOVA (Handout L2)	Chap: H 17.1-17.4, K&F 11
Oct 29	Factorial ANOVA	Chap: H 17.5-17.10
Oct 31	Factorial ANOVA	Chap: H 17.5-17.10
Nov 5	Factorial ANOVA & Midterm Review	
Nov 7	Test #2	
Nov 12	Repeated Measures (L2 due, Handout L3)	Chap: H 18, Sup 2
Nov 14	Repeated Measures	Chap: H 18, Sup 2
Nov 19	Repeated Measures	Chap: H 18, S2, K&F 12
Nov 21	Mixed Designs & Factorial Repeated Measures	Sup 2, K&F 13
Nov 26	Mixed Designs & Factorial Repeated Measures	Sup 2
Nov 28	Mixed Designs & Factorial Repeated Measures (L3 due)	Sup 2
Dec 3	Test #3	

H - Refers to the Howell (2008) text entitled "Fundamental Statistics for the Behavioral Sciences"

Sup - Refers to two chapters from supplemental readings.

K&F: Refer to chapters from the Kirkpatrick and Feeney book "A Simple Guide to SPSS for Windows"

L1-L3: Refers to the three lab assignments

TENTATIVE TUTORIAL/REVIEW SCHEDULE

Tutorial #	Date	Objective
No Tutorial	Week of Sept 10 th	----
Tutorial 1	Week of Sept 17 th	t-tests
Tutorial 2	Week of Sept 24 th	One-way ANOVA
No Tutorial	Week of Oct 2 nd	----
No Tutorial	Week of Oct 8 th	----
Review Session	Tuesday Oct 9 th	Available for questions on Tuesday before the Test #1 (location TBA, 9-5)
Tutorial 3	Week of Oct 15 th	Multiple Comparisons: A Priori
Tutorial 4	Week of Oct 22 nd	Multiple Comparisons: Post Hocs
Tutorial 5	Week of Oct 29 th	Factorial ANOVA
No Tutorial	Week of Nov 5 th	----
Review Session	Tuesday Nov 6 th	Available for questions on Friday before Test #2 (location TBA, 9-5)
Tutorial 6	Week of Nov 12 th	Repeated measures ANOVA
Tutorial 7	Week of Nov 20 th	Mixed and factorial repeated measures designs
No Tutorial	Week of Nov 27 th	----
Review Session	Friday Nov 30 th	Available for questions on Friday before Test #3 (location TBA, 9-5)