

Psychology 391

Advanced Data Analysis

Winter 2015

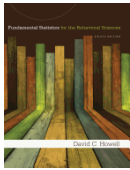
UPDATED December 10th, 2014

Class Time: Tuesday and Thursday 2:30 - 4:20
Place: DWE 3522A
Instructor: James Beck
Office: PAS 4028
Office Hours: Monday 1:30 - 2:30, or by appointment
Phone: 519-888-4567 x33945
Email: james.beck@uwaterloo.ca
Course Website: <https://sites.google.com/site/psych391/>

Teaching Assistant:

Kevin Barber
Office: PAS 3203
Office Hour: Wednesday 12: - 1:00 or by appointment
Email: k4barber@uwaterloo.ca
Lab: 101 (Friday 2:30 – 3:20, PAS 1237)

***Optional* Text:**



Howell, D. C. (2014). *Fundamental Statistics for the Behavioral Sciences*. Thomson.

I will also provide a number of supplemental reading materials on LEARN

Course Objectives:

This course builds from the material covered in Psychology 292. Topics that will be covered include: t-tests, Power, 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 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	February 3, 2015	25%
Test #2	March 10, 2015	25%
Test #3	Final Exam Period	25%
Graded Lab Assignments (N=3)	Jan 29 (5%), Mar 10 (10%) and Apr 2 (10%)	25%
Research Participation (or assignment)		4%

TENTATIVE LECTURE SCHEDULE

Week	Date	Day	Topic	Reading	Assignment
1	January 6, 2015	Tuesday	Course introduction		
1	January 8, 2015	Thursday	Review of basics	H1, H2, H4, H5, H6, H8	
2	January 13, 2015	Tuesday	Hypothesis testing	H12, H13, H14	L1 handed out
2	January 15, 2015	Thursday	T-tests	H12, H13, H14	
3	January 20, 2015	Tuesday	Power, effect sizes	H15	
3	January 22, 2015	Thursday	ANOVA	H16	
4	January 27, 2015	Tuesday	ANOVA	H16	
4	January 29, 2015	Thursday	Review day		L1 due
5	February 3, 2015	Tuesday	Midterm Exam 1		
5	February 5, 2015	Thursday	Planned comparisons	H16, Sup 1	L2 handed out
6	February 10, 2015	Tuesday	Planned comparisons	H16, Sup 1	
6	February 12, 2015	Thursday	Post hoc comparisons	H16, Sup 1	
	February 17, 2015	Tuesday	<u>Reading Week</u>		
	February 19, 2015	Thursday			
7	February 24, 2015	Tuesday	Post hoc comparisons	H16, Sup 1	
7	February 26, 2015	Thursday	Factorial ANOVA	H17	
8	March 3, 2015	Tuesday	Factorial ANOVA	H17	
8	March 5, 2015	Thursday	Review day		
9	March 10, 2015	Tuesday	Midterm Exam 2		L2 due
9	March 12, 2015	Thursday	Repeated measures	H18, Sup 2	L3 handed out
10	March 17, 2015	Tuesday	Repeated measures	H18, Sup 2	
10	March 19, 2015	Thursday	Mixed designs	Sup 2	
11	March 24, 2015	Tuesday	Mixed designs	Sup 2	
11	March 26, 2015	Thursday	Factorial repeated measures	Sup 2	
12	March 31, 2015	Tuesday	Factorial repeated measures	Sup 2	
12	April 2, 2015	Thursday	Review day		L3 due

H - Refers to the Howell (2014) text entitled “*Fundamental Statistics for the Behavioral Sciences*”

Sup - Refers to two chapters from supplemental readings.

L1-L3: Refers to the three lab assignments

TENTATIVE LAB SCHEDULE

Week	Date	Day	Topic
2	January 16, 2015	Friday	Intro to SPSS, T-tests
3	January 23, 2015	Friday	One-way ANOVA
6	February 13, 2015	Friday	Multiple Comparisons Pt. 1
7	February 27, 2015	Friday	Multiple Comparisons Pt. 2
8	March 6, 2015	Friday	Factorial ANOVA
9	March 13, 2015	Friday	Repeated Measures ANOVA
10	March 20, 2015	Friday	Mixed Factorial ANOVA
11	March 27, 2015	Friday	Factorial Repeated Measures ANOVA

Tests (75%):

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

Lab Assignments (25%):

There will be three lab assignments in this course. The first lab assignment 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.

Late work and missed exams:

In general I do not accept late work. In certain circumstances exceptions can be made:

- Documentation of illness or other circumstances leading to missing the deadline (e.g., bereavement).
- Contact instructor within 48 hours. Whenever possible, contact should be made **before the deadline** has passed.
- In the case of a missed final exam, the instructor and student will negotiate an extension for the final exam which will typically be written as soon as possible, but no later than the next offering of the course.

Lab Tutorials:

Each student should be registered in a lab section. Labs are intended to provide students with 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 lab schedule is posted on page 2 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 before the first lab. 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 one of the TA's or me during office hours if you are having any difficulties with the material.

Research Experience Marks Information and Guidelines

Experiential learning is considered an integral part of the undergraduate program in Psychology. Research participation is one example of this, article review is another. A number of undergraduate courses have been expanded to include opportunities for Psychology students to earn grades while gaining research experience.

Since experiential learning is highly valued in the Department of Psychology, students may earn a "**bonus**" grade of up to **4%** in this course through research experience. Course work will make up 100% of the final mark and a "bonus" of up to 4% may be earned and will be added to the final grade if/as needed to bring your final grade up to 100%.

The two options for earning research experience grades (participation in research and article review) are described below. Students may complete any combination of these options to earn research experience grades.

Option 1: Participation in Psychology Research

Research participation is coordinated by the Research Experiences Group (REG). Psychology students may volunteer as research participants in lab and/or online (web-based) studies conducted by students and faculty in the Department of Psychology. Participation enables students to learn first-hand about psychology research and related concepts. Many

students report that participation in research is both an educational and interesting experience. Please be assured that all Psychology studies have undergone prior ethics review and clearance through the Office of Research Ethics.

Educational focus of participation in research

To maximize the educational benefits of participating in research, students will receive feedback information following their participation in each study detailing the following elements:

- Purpose or objectives of the study
- Dependent and independent variables
- Expected results
- References for at least two related research articles
- Provisions to ensure confidentiality of data
- Contact information of the researcher should the student have further questions about the study
- Contact information for the Director of the Office of Research Ethics should the student wish to learn more about the general ethical issues surrounding research with human participants, or specific questions or concerns about the study in which s/he participated.

Participation in LAB studies has increment values of 0.5 participation credits (grade percentage points) for each 30-minutes of participation. Participation in ONLINE studies has increment values of .25 credits for each 15-minutes of participation. Researchers will record student's participation, and at the end of the term the REG Coordinator will provide the course instructor with a credit report of the total credits earned by each student.

How to participate?

Study scheduling, participation and grade assignment is managed using the SONA online system. All students enrolled in this course have been set up with a SONA account. You must get started early in the term.

[Participating/SONA information: How to log in to Sona and sign up for studies](#)

**** Please do not ask the Course Instructor or REG Coordinator for information unless you have first thoroughly read the information provided on this website. ****

More information about the REG program is available at:

[REG Participants' Homepage](#)

Option 2: Article Review as an alternative to participation in research

Students are not required to participate in research, and not all students wish to do so. As an alternative, students may opt to gain research experience by writing short reviews (1½ to 2 pages) of research articles relevant to the course. The course instructor will specify a suitable source of articles for this course (i.e., scientific journals, newspapers, magazines, other printed media). *You must contact your TA to get approval for the article you have chosen before writing the review.* Each review article counts as one percentage point. To receive credit, you must follow specific guidelines. The article review must:

- **Be submitted before the [last day of lectures](#). Late submissions will NOT be accepted under ANY circumstances.**
- Be typed
- Fully identify the title, author(s), source and date of the article. A copy of the article must be attached.
- Identify the psychological concepts in the article and indicate the pages in the textbook that are applicable. Critically evaluate the application or treatment of those concepts in the article. If inappropriate or incorrect, identify the error and its implications for the validity of the article. You may find, for example, misleading headings, faulty research procedures, alternative explanations that are ignored, failures to distinguish factual findings from opinions, faulty statements of cause-effect relations, errors in reasoning, etc. Provide examples whenever possible.
- Clearly evaluate the application or treatment of those concepts in the article.

- Keep a copy of your review in the unlikely event we misplace the original.

The Official Version of the Course Outline:

If there is a discrepancy between the hard copy outline and the outline posted on the course website, the outline on website will be deemed the official version. Outlines on the website may change as instructors develop a course, but they become final as of the first class meeting for the term.

Accommodations for Students with Disabilities:

The [AccessAbility](#) office, 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 AS office at the beginning of each academic term.

Concerns About the Course or Instructor (Informal Stage):

We in the Psychology Department take great pride in the high quality of our program and our instructors. Though infrequent, we know that students occasionally find themselves in situations of conflict with their instructors over course policies or grade assessments. If such a conflict arises, the Associate Chair for Undergraduate Affairs (Dr. Myra Fernandes) is available for consultation and to mediate a resolution between the student and instructor. Dr. Fernandes' contact information is as follows: Email: mafernan@uwaterloo.ca, phone 519-888-4567 x32142.

A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. See Policy 70 and 71 below for further details.

Academic Integrity, Academic Offenses, Grievance, and Appeals:

To protect course integrity, as well as to provide appropriate guidance to students, course outlines in the Faculty of Arts must include the following note on avoidance of academic offenses:

Academic Integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [Check <http://www.uwaterloo.ca/academicintegrity/> for more information.]

Discipline: A student is expected to know what constitutes academic integrity [check <http://www.uwaterloo.ca/academicintegrity/>], to avoid committing academic offenses, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about 'rules' for group work/collaboration should seek guidance from the course instructor, academic advisor, or the Undergraduate Associate Dean. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 - Student Discipline. For information on categories of offenses and types of penalties, students should refer to [Policy 71](#) - Student Discipline, <http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm>

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read [Policy 70](#) - Student Petitions and Grievances, Section 4, <http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm>

Appeals: A student may appeal the finding and/or penalty in a decision made under Policy 70 - Student Petitions and Grievances (other than regarding a petition) or Policy 71 - Student Discipline if a ground for an appeal can be established. Read [Policy 72](#) - Student Appeals, <http://www.adm.uwaterloo.ca/infosec/Policies/policy72.htm>

Academic Integrity Website (Arts): <https://uwaterloo.ca/arts/current-undergraduates/student-support/ethical-behavior>

Academic Integrity Office (UW): <http://uwaterloo.ca/academicintegrity/>