

PSYCHOLOGY 292: BASIC DATA ANALYSIS
Winter 2009

In this course you will learn the basics of using descriptive and inferential statistics in the analysis of psychological data. The course emphasizes understanding of fundamental statistical principles rather than “cookbook” application of statistical formulas. These principles provide a foundation for more advanced statistical techniques that you may study in later courses. An appreciation of basic statistical principles, furthermore, can help you to be a more critical “consumer” of reported research findings.

Instructor:

Dr. Derek Koehler (PAS 4050; dkoehler@uwaterloo.ca)

TAs: To be announced on UW ACE, along with their tutorial sections and office hours.

Course website: For announcements, lecture slides and other course material, course marks, etc., please click on the Psych 292 course entry on UW ACE (<http://uwace.uwaterloo.ca>).

Text: Howell, *Fundamental Statistics for the Behavioral Sciences (6th Edition)*. Brooks/Cole.

Lectures: Tuesdays/Thursdays 10:30 a.m. - 12:20 p.m. in AL 116. No class on March 17 (Campus Day).

Tutorials

Section 101:	Tuesdays	4:30 p.m. - 5:50 p.m.	HH 280
Section 102:	Wednesdays	4:30 p.m. - 5:50 p.m.	HH 150
Section 103:	Tuesdays	1:00 p.m. - 2:20 p.m.	PHY 235
Section 104:	Wednesdays	6:00 p.m. - 7:20 p.m.	HH 150
Section 105:	Tuesdays	4:30 p.m. - 5:50 p.m.	ML 246
Section 106:	Wednesdays	8:30 a.m. - 9:50 a.m.	HH 138

Note: Tutorials will not be held the first week of class.

Evaluation

Assignments	10%	(1% each for 10 of the 11 sets of weekly target exercises)
Unit Tests	60%	(4 in-class tests, collectively worth 60% of final mark)
Final exam	30%	(held during final exam period as scheduled by registrar)

Unit Tests and Final Exam

The course is divided into four units:

Part A (Weeks 1-3): Descriptive statistics (characterizing a sample of data)

Part B (Weeks 4-6): Probability and statistical inference (generalizing from sample to population)

Part C (Weeks 7-9): Hypothesis testing (how likely is sample given a hypothesis about the population?)

Part D (Weeks 10-12): Correlation and regression (examining association between variables)

An in-class test is scheduled at the end of each unit, covering the material from that unit. In this sense, the unit tests are non-cumulative, but topics covered in this course naturally build on one another. For example, to carry out a t-test (covered in Part C), you need to know how to calculate a standard deviation (covered in Part A). All unit tests are closed-book, but a sheet with relevant statistical formulas will be provided so you won't have to memorize them. For the final exam, which is cumulative, you can use your textbook and notes. Test dates are listed in the schedule below; final exam is scheduled by the registrar.

The four unit tests, taken together, will account for 60% of your final mark. Your highest test score will count for 20% and your lowest for only 10%, with the two intermediate scores counting 15% each. This should help to offset, at least somewhat, the effects of a having “bad day” on one of the unit tests. Out of fairness to other students, please note that the instructor cannot offer any further changes in the weighting of the unit tests and final exam, or additional work for extra credit.

If you have a concern about how an item on a unit test was marked, please first have a look at the answer key (posted on UW ACE). If the answer key does not address your concern, please arrange to discuss

the matter further with the TA who marked the item. (The answer key will indicate who marked each item.) If you still feel that your concern has not been addressed, please put it in writing and submit it to the instructor, who will then discuss it with the TA and make a final decision.

Rescheduling Unit Tests and Exams

Unit tests or exams can only be rescheduled in the case of an illness (or other medical problem), circumstances of serious distress due to a family emergency or personal crisis, or (for students who commute) adverse weather on the day of the test. Documentation of some form is generally required in order to reschedule a test or exam. It is important to be aware that, in such cases, the only accommodation that can be offered is rescheduling the test or exam. Once the test or exam has been completed, poor performance due to circumstances such as those outlined above cannot be used as a basis for requesting re-weighting the contribution of the test or exam to the student's final course mark.

Students should contact their tutorial TA as soon as possible if they need to reschedule a unit test or exam, ideally by e-mail with a copy sent to the instructor. Documentation of the circumstances leading to the rescheduling should be provided either to the TA or to the instructor, in most cases at or before the time the rescheduled test or exam is administered. It is the *student's responsibility* to arrange to take the rescheduled test or exam as soon as possible after the originally scheduled date. (If you e-mail your TA and don't receive a reply within 24 hours, please send another message and copy it to the instructor.) In the case of an illness, for example, the test or exam can only be postponed for the period covered by the documentation of the illness. Any delays in taking the test or exam beyond that period must be justified to the instructor's satisfaction, subject to the availability of a TA to administer the rescheduled test or exam.

Once the marked unit test has been returned to students, typically two weeks after it is administered, it is no longer possible to reschedule its administration. Any student who has not taken the test at that point will receive a zero, except in the unusual circumstance in which documentation can be provided covering the entire period since the originally scheduled test date.

Exercises and Tutorials

A set of "target exercises" (drawn mainly from the Howell text) will be covered in tutorial each week. The assigned exercises and due dates are listed in the course schedule below. There will be a total of 11 such assignments, of which you may miss one. The remaining 10 will count 1% each toward your final mark; the assignments will not be graded but simply checked for completion. No credit will be given for late assignments. Assignments may be submitted in class or in the Psychology mailroom (PAS 3021A). *Please indicate your tutorial section number or TA's name on your completed assignment.* Note that the set of exercises for the final week of lectures is suggested for practice but will not be handed in as an assignment. The TAs will answer questions and work through the "target exercises" in the tutorials each week. You will find the tutorials to be much more helpful if you have attempted to solve the problems for yourself prior to each meeting. Although attending tutorials is optional, many students find the tutorials to be the most valuable feature of the course.

How to Do Well in the Course

The key to learning statistics is practice. There is a set of exercises at the end of each chapter of the Howell text. Answers to the odd-numbered problems can be found at the back of the book; solutions to all problems are available through our course entry on UW ACE. You should try to solve all these problems—it's the best way to test whether you've completely understood the material covered in each chapter. Additional exercises (which can be downloaded through UW ACE) are provided for Part B of the course, where the lectures will depart somewhat from the textbook.

Here are some additional things you can do to more effectively learn the material and enjoy the course:

- carefully read the assigned chapters from the Howell text each week *before* the lecture
- take the publisher's web quiz to test your understanding of the material covered in each chapter (linked from the publisher's website, or from the course UW ACE entry)
- ask questions, in lectures and tutorials, if you don't understand something
- see your TA during office hours if you need additional help

If you find that you are having trouble with the material and need more help than a TA can provide during tutorial and office hours, you might consider getting help from a tutor. A list of students who recently took the class, did well, and have expressed a willingness to offer tutoring services (either for pay or on a voluntary basis) is available from the course website on UW ACE. It is left to the student to contact and make arrangements directly with a tutor, and obviously it cannot be guaranteed that every student will benefit from tutoring, but working with a tutor may be a useful supplement to the course for those needing a little extra help.

Calculators

For the exercises, unit tests, and final exam, you will find it helpful to have a calculator, ideally with basic statistical functions (e.g., standard deviation). *Please bring your calculator to every class meeting.*

Sending Questions by E-mail

This is a large course, and as a result we typically receive lots of e-mail from students with questions about course content, assignments, unit tests and exams, etc. We are happy to receive questions by e-mail and will do our best to answer them promptly. To manage all this e-mail, however, we ask that whenever possible you direct your e-mail questions to your tutorial TA. The TA will either answer your question or forward it to the instructor as appropriate. For basic questions about the course content and scheduling, please be sure to read through the syllabus and announcements on UW ACE before sending e-mail, as often the answers to questions we receive can be found there.

Additional information from Colin Ellard, Associate Chair, Undergraduate Affairs, Department of Psychology:

The Official Version of the Course Outline

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

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.

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. Colin Ellard) is available for consultation and to mediate a resolution between the student and instructor. Dr. Ellard's contact information is as follows:

Email: cellard@uwaterloo.ca
Ph 519-888- 4567 ext 36852

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 incorporate 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.

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>

Discipline: A student is expected to know what constitutes academic integrity, 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 professor, 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>

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>

Topic Schedule for Psychology 292, Winter 2009

week	topic	chapter(s)	lectures	tutorial	exercises	due	on test...
1	measurement, displaying data	1-3	Jan 6, 8	Jan 13/14	3.1, 3.2, 3.9	Jan 16	1 (Jan 27)
2	central tendency and variability	4, 5	Jan 13, 13	Jan 20/21	4.11 (only for the data on ADDSC), 4.12, 4.17 (only for the median), 4.18, 5.1, 5.2, 5.3, 5.4, 5.15, 5.16, 5.21 (for part b, you don't have to make the "graphics")	Jan 23	1 (Jan 27)
3	normal distribution	6	Jan 20, 22	Jan 27/28	6.1, 6.3, 6.4, 6.5, 6.7, 6.8	Jan 30	2 (Feb 24)
4	probability	7	Jan 29	Feb 3/4	7.2, 7.3, 7.4, 7.5, 7.10, 7.16, 7.18, 7.19, 7.20 (thought question; no need to calculate)	Feb 6	2 (Feb 24)
5	sampling distributions	8.2, 12.1	Feb 3, 5	Feb 10/11	12.1, 12.2, 12.3, 12.4, 12.5 plus Week 5 Supplemental Exercise Set	Feb 13	2 (Feb 24)
6	confidence intervals	12.7	Feb 10, 12	Feb 24/25	No textbook exercises; just Week 6 Supplemental Exercise Set	Feb 27	3 (Mar 19)
7	hypothesis testing: single and related samples	8, 12	Feb 26	Mar 3/4	12.6, 12.8, 12.9, 12.10, 12.11, 12.12, 12.14, 12.15, 12.17, 12.22 [download problems from 5 th edition of text from ACE]	Mar 6	3 (Mar 19)
8	hypothesis testing: independent samples	13, 14	Mar 3, 5	Mar 10/11	13.6, 13.12, 13.20, 14.8, 14.11, 14.13, 14.17	Mar 13	3 (Mar 19)
9	power	15 (skip 364-65)	Mar 10	Mar 17/18	15.3, 15.5, 15.9, 15.10, 15.12, 15.18, 15.19	Mar 20	4 (Apr 2)
10	correlation	9	Mar 12	Mar 24/25	9.1, 9.2, 9.4, 9.7, 9.10, 9.19 [download problems from 5 th edition of text from ACE]	Mar 27	4 (Apr 2)
11	regression	10	Mar 24, 26	Mar 31/ Apr 1	10.1, 10.2, 10.7, 10.8, 10.9, 10.10, 10.14, 10.20 (for b, predict weight from height)	Apr 3	4 (Apr 2)
12	chi-square	19 (skip 19.10)	Mar 31	Apr 2*	19.5, 19.6, 19.7, 19.8, 19.18 (recommended, not to be handed in)	--	on final

* Tutorial coverage of Week 12 lecture material will take place in class following the unit test on Thursday April 2.