

**PSYCHOLOGY 292: BASIC DATA ANALYSIS**  
**Winter 2013**

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 LEARN, 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 LEARN.

*Text:* In lieu of a traditional textbook, students will be asked to subscribe to an online “course” called Statistical Reasoning, which is part of the Open Learning Initiative at Carnegie Mellon University. Please register at <http://oli.cmu.edu/> and enter the **course key 3010LEC001**. Please register using your real name and, for your “account ID,” use your UWaterloo email address. This will allow us to more easily match your records across the OLI and LEARN systems.

*Lectures:* Tuesdays/Thursdays 10:30 a.m. - 12:20 p.m. in AL 116.

*Tutorials*

Section 101:	Tuesdays	4:30 p.m. - 5:50 p.m.	ML 354
Section 102:	Wednesdays	4:30 p.m. - 5:50 p.m.	HH 150
Section 103:	Tuesdays	1:00 p.m. - 2:20 p.m.	MC 2038
Section 104:	Wednesdays	6:00 p.m. - 7:20 p.m.	HH 2107
Section 105:	Tuesdays	4:30 p.m. - 5:50 p.m.	DWE 1502
Section 106:	Wednesdays	8:30 a.m. - 9:50 a.m.	PAS 1241

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

*Evaluation*

Checkpoints	10%	(average of best 12 scores among 14 online checkpoints)
Unit Tests	60%	(3 in-class tests, collectively worth 60% of final mark)
Final exam	30%	(held during final exam period as scheduled by registrar)

*Checkpoints*

You will be asked to complete these relatively brief, online (<http://oli.cmu.edu>) assessments throughout the term. There are 14 assigned checkpoints in total; if necessary you can miss two as final marks are based on the best 12 of 14 checkpoint scores. **You are allowed up to three attempts at each checkpoint** and will receive feedback on each attempt. Your final score for each checkpoint will be determined by the percentage of correctly answered items from your best-scoring attempt.

checkpoint(s)	due
Examining Distributions 1	Jan 18
Examining Distributions 2	Jan 25
Random Variables	Feb 8
Sampling Distributions 1 <b>and</b> 2	Feb 15*
Estimation	Mar 1
Hypothesis Testing for Population Proportion <b>and</b> Population Mean	Mar 8*
Two Independent Samples <b>and</b> Matched Pairs	Mar 15*
Examining Relationships 1	Mar 22
Examining Relationships 2	Mar 29
Case C → C and Q → Q <b>and</b> Inference for Relationships	Apr 8*

\* Note that **two** checkpoints are due on these dates.

### *Unit Tests and Final Exam*

Three unit tests will be held in class. In a sense, the three tests are non-cumulative, but topics covered in this course naturally build on one another. For example, to carry out a t-test (covered on Test 3), you need to know how to calculate a standard deviation (covered on Test 1). All unit tests are closed-book, but sheets with relevant statistical formulas and tables will be provided so you won't have to memorize them. These sheets will also be provided for use during the final exam, which is cumulative; for the final exam, students may also bring and use one additional (double-sided) page of their own notes. Test dates are listed in the schedule below; final exam is scheduled by the registrar.

The three unit tests, taken together, will account for 60% of your final mark. Your highest test score will count for 25% and your lowest for only 15%, with the intermediate score counting for 20%. 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 LEARN). 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.

A rewrite session will be scheduled for each unit test for those students who were unable to take it at the scheduled time and can provide valid documentation. Scheduled rewrite sessions will be posted on LEARN; please email the TA who will be administering the session (as indicated on LEARN) to confirm that you will be attending the rewrite session. *All students who missed the originally scheduled unit test are expected to attend the rewrite session.* Exceptions will be granted only if additional documentation is provided covering the date of the rewrite session; decisions about how to proceed then will be made by the instructor on a case-by-case basis.

*Official Department Policy:* Students who are requesting accommodation for course requirements (assignments, midterm tests, final exams, etc.) due to illness should do the following:

- seek medical treatment as soon as possible and obtain a completed UW Verification of Illness Form\*:

[http://www.healthservices.uwaterloo.ca/Health\\_Services/verification.html](http://www.healthservices.uwaterloo.ca/Health_Services/verification.html)

- submit that form to the instructor within 48 hours.
- (preferably) inform the instructor by the due date for the course requirement that you will be unable to meet the deadline and that documentation will be forthcoming.

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.

In the case of a missed assignment deadline or midterm test, the instructor will either:

1. waive the course component and re-weight remaining term work as he/she deems fit according to circumstances and the goals of the course, or
2. provide an extension.

In the case of bereavement, the instructor will provide similar accommodations to those for illness. Appropriate documentation to support the request will be required.

Students who are experiencing extenuating circumstances should also inform their academic advisors regarding their personal difficulties.

## *Tutorials*

Each week in tutorial sessions, your TA will guide the group through solutions to a set of target exercises. These target exercises are drawn from unit tests given in previous years, and so are a good guide to what you can expect to see on unit tests this term. The target exercises to be covered each week will be posted in advance. You will likely find the tutorials to be 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 helpful feature of the course.

## *How to Do Well in the Course*

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

- carefully complete assigned reading each week *before* the lecture
- complete the “Learn by Doing” and “Did I Get This?” activities as you encounter them while doing the assigned reading in the online textbook
- work through the four practice problem sets (one per section of the course; downloadable from LEARN), on your own, *before* looking at the solutions
- test yourself on the previous year’s unit tests (available on LEARN), ideally in one timed (75-minute) session as will be the case for the actual test
- 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 on the course LEARN site. It is left to you 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 tutorial 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 LEARN before sending e-mail, as often the answers to questions we receive can be found there.

## ***Additional Information from Bill Chesney, Associate Dean of Arts, Undergraduate Studies***

### **Academic Integrity**

**Academic Integrity:** *In order to maintain a culture of academic integrity, members of the University of Waterloo are expected to promote honesty, trust, fairness, respect and responsibility.*

**Discipline:** *A student is expected to know what constitutes academic integrity, to avoid committing academic offences, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (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://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-71>.*

**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://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-70>. In addition, consult <http://arts.uwaterloo.ca/student-grievances-faculty-arts-processes> for the Faculty of Arts’ grievance processes.*

**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://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-72>.*

### **Academic Integrity website (Arts):**

[http://arts.uwaterloo.ca/arts/ugrad/academic\\_responsibility.html](http://arts.uwaterloo.ca/arts/ugrad/academic_responsibility.html) Academic Integrity Office (uWaterloo): <http://uwaterloo.ca/academic-integrity/>

### **Accommodation for Students with Disabilities**

**Note for students with disabilities:** *The AccessAbility Services (AS) 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.*

**Schedule for Psychology 292, Winter 2013**

<b>lecture</b>	<b>topic</b>	<b>module(s)</b>	<b>tutorial</b>	<b>unit test</b>
<b>1</b> Jan 8	introduction	1 (through Measures of Center)	--	1 (Jan 29)
<b>2</b> Jan 10	displaying data, measures of center		Jan 15/16	
<b>3</b> Jan 15	measures of spread	1 (from Measures of Spread)	Jan 15/16	
<b>4</b> Jan 17	probability	5	Jan 22/23	
<b>5</b> Jan 22	random variables	6 (Discrete Random Variables)	Jan 22/23	
<b>6</b> Jan 24	normal distribution 1	6 (Continuous Random Variables)	Jan 29/30	2 (Feb 28)
<b>7</b> Jan 31	normal distribution 2		Feb 5/6	
<b>8</b> Feb 5	sampling distributions 1: EV and SE	7	Feb 5/6	
<b>9</b> Feb 7	sampling distributions 2: central limit theorem		Feb 12/13	
<b>10</b> Feb 12	confidence intervals 1: population mean	8 and 9	Feb 12/13	
<b>11</b> Feb 14	confidence intervals 2: population proportion		Feb 26/27	
<b>12</b> Feb 26	hypothesis testing: one-sample tests	10 (except Type I and Type II Errors)	Mar 5/6	3 (Mar 26)
<b>13</b> Mar 5	hypothesis testing: related samples	11 (Matched Pairs)	Mar 5/6	
<b>14</b> Mar 7	hypothesis testing: independent samples	11 (Independent Samples)	Mar 12/13	
<b>15</b> Mar 12	hypothesis testing: effect size and power 1	10 (Type I and Type II Errors) <b>plus</b> wise.cgu.edu/powermod	Mar 12/13	
<b>16</b> Mar 14	hypothesis testing: effect size and power 2		Mar 19/20	
<b>17</b> Mar 19	correlation	2 (pp. 42-51)	Mar 26/27	covered as part of cumulative final exam
<b>18</b> Mar 21	regression 1	2 (pp. 52-end), 12 (Case Q → Q)	Mar 26/27	
<b>19</b> Mar 28	regression 2		Apr 2/3	
<b>20</b> Apr 2	chi-square	2 (Case C → C), 12 (Case C → C)	Apr 2/3	
<b>21</b> Apr 4	test selection (review)	12 (Wrap-Up: Inference for Relationships)	--	