Fall 2017—M/W/F @ 9:30 INTRODUCTION TO DATA ANALYSIS Psyc-2101/3—003

COURSE OUTLINE

Instructor: Dr. M. K. Halldorson   Office: 4L04D Lockhart Hall
Telephone: 786-9432   email: m.halldorson@uwinnipeg.ca
Office Hour: By appointment   Lectures: 1L07

Required: 1. Text - Understanding Statistics in the Behavioral Sciences. (10th Edition)
                      R. R. Pagano, (2013).

                   2. Ancillary - Aplia Access Card. Cengage Learning

Calendar Description:

This lab course introduces basic data analytic techniques appropriate to experimental and non-experimental research designs. Topics include frequency distributions, descriptive statistics (e.g., mean, standard deviation), and inferential statistics (e.g., estimation and hypothesis testing for means, correlation, and count data). The lab component provides an opportunity to develop computational and basic computer skills relevant to data analysis. This course is required for Majors and Honours students in Psychology.

Mechanics of the Course:

The topics in this course will be taught through lectures, labs, demonstrations, and assignments. Students are responsible for all missed material in both the lecture and lab. Arrangements to obtain any missed material must be made with other students in the class, not the instructors or TAs.

Evaluation:

A. Exams – Students are responsible for all material presented in Lecture and Lab classes, as well as material in assigned readings, even if not covered in Lecture or Labs. Students will be required to write two term tests and a final exam. The format for these tests may include, but is not limited to, multiple-choice, short answer, and statistical problem type questions. Students will have use of a calculator, a formula sheet (without labels for the formula), and statistical tables. Where English is not your first language, you *may* be permitted to bring a *translation-only* dictionary (i.e., with no word definitions). You must submit your translation-only dictionary to me for approval before the test date. Please bring Photo-ID to all tests.

  Term Test #1—**Wednesday, October 18, 2017**—will be given in class and will be based on assigned readings and materials discussed in class and labs prior to that date.
  Value: 35%

  Final Test #2—Wednesday, December, 13, 2017—will cover the entire course with emphasis on topics covered in class and labs not covered by the first term test.
  Value: 45%

Make-ups – Students will be allowed to write a make-up test if absent with good reason on a test date. Absences from tests will be excused for reasons relating to sickness, death in the family, or religious holidays. Students may be required to present an appropriate note from a physician or member of the clergy. Tests missed without an acceptable excuse will be assigned a mark of zero. Students must notify me as soon as possible by telephone, email, or in person before or after missing a test.

B. **Labs**—Please consult the lab outline for more detail. Value: 10%

C. **Aplia**—Weekly online assignments. Value: 10%

Grading Procedure:

The maximum number of points possible for this course is 100. A numerical score out of 100 will be determined for each student by totalling the points he or she has earned on the tests, quizzes, and labs. The numerical score determined in this way will be converted to a letter grade according to the following scale: **[The cut-offs are <u>tentative</u> and subject to change in either direction by (i) the course instructor, (ii) the Departmental Review Committee or (iii) the Senate.]**

The translation from marks to letter grades in this course is as follows.

A   85 and over   B+ 75 - 79   C+ 65 - 69   D 50 - 59
A- 80 - 84   B 70 - 74   C 60 - 64   F   0 - 49

    A+ at instructor's discretion

Example of Grade Determination:

The following table illustrates the grade calculations.

Component	Weight	Mark	Mark X Weight/100
Term Test #1	35%	72%	25.2
Final Test #2	45%	69%	31.0
Lab	10%	84%	8.4
Aplia	10%	82%	8.2
Total	100%		72.8 = 73 Mark

The student in this example would receive a letter grade of B.

The Voluntary Withdrawal (W) date for this course is **Friday, November 10, 2017.** Please read the appropriate items in the Regulations and Policies section of the General Calendar dealing with withdrawal dates, Senate appeals, plagiarism, cheating, and academic misconduct:
http://www.uwinnipeg.ca/academics/calendar/index.html

Services for Students with Disabilities:

Students with documented disabilities requiring academic accommodations for tests/exams (e.g., private space) or during lectures/laboratories (e.g., access to volunteer note-takers) are encouraged to contact the Coordinator of Disability Services (DS) at 786-9771, to discuss appropriate options. Specific information about DS is available on-line at http://www.uwinnipeg.ca/index/services-disability. All information about disability is confidential.

University Policies:

All students, faculty and staff have the right to participate, learn and work in an environment that is free of harassment and discrimination. The UW Respectful Working and Learning Environment Policy may be found online at http://www.uwinnipeg.ca/respect.

Students may choose not to attend classes or write examinations on holy days of their religion, but they must notify their instructors at least two weeks in advance. Instructors will then provide opportunity for students to make-up work and/or examinations without penalty. A list of religious holidays can be found at: http://uwinnipeg.ca/academics/calendar/docs/important-notes.pdf

We ask that you please be respectful of the needs of classmates and instructors/professors by avoiding the use of unnecessary scented products while attending lectures. Exposure to scented products can trigger serious health reactions in persons with asthma, allergies, migraines or chemical sensitivities. Please consider using unscented necessary products and avoiding unnecessary products that are scented (e.g. perfume).

Students who plan to conduct research interviews, focus groups, surveys, or any other method of collecting data from any person, even a family member, must obtain the approval of the appropriate ethics committee before commencing data collection. Exceptions are research activities in class as a learning exercise. See http://www.uwinnipeg.ca/research/human-ethics.html for submission requirements and deadlines.

Students facing a charge of academic or non-academic misconduct may choose to contact the University of Winnipeg Students' Association (UWSA) where a student advocate will be available to answer any questions about the process, help with building a case, and ensuring students have access to support. For more information or to schedule an appointment, visit our website at http://www.theuwsa.ca/academic-advocacy or call 204-786-9780.

Tentative Course Timetable

Week of	Topic	Readings
Sept 04	Introduction and Descriptive Measures	1 – 4 (**X** pp. 55-61)
Sept 11	Standard Scores and the Normal Curve	5
Sept 18	Random Sampling and Probability	8
Sept 25	Binomial Distribution	9 (**X** pp. 229-230)
Oct 02	Hypothesis Testing and Sign Test	10
Oct 09	*Fall Term Reading Week.* *No Classes, Oct 09 - 12.*	
Oct 16	Sign Test	10
Wed Oct 18	**Term Test #1 (35%)**	**1 – 5, 8 and 9**
Oct 23	Sampling Distribution of Mean and Single Sample *z*-test	12 (**X** pp. 317-323)
Oct 30	Student's *t*-test for Single Samples and Confidence Intervals	13 (**X** pp. 346-348)
Nov 06	Student's *t*-test for Correlated and Independent Groups	14
Nov 13	Introduction to the Analysis of Variance	15 (**X** pp. 420-434)
Nov 20	Correlation and Testing the Significance of Pearson *r*	6 (**X** pp. 139-142) 13 (**R** pp. 346-348)
Nov 27	Linear Regression	7 (**X** pp. 169-171) 7 (**X** pp. 174-178)
Mon Dec 04	Linear Regression and Review Lectures End	18 (**R** Relevant Parts)
Wed Dec 13	**Final Test #2 (45%), Room: 1L07.**	

Notes: **R** – Read; **X** – Exclude. **Labs begin Sept. 05.**

The course timetable is only a guide to topics, as some topics may be added or deleted as time dictates.

KEYS TO SUCCESS AT INTRODUCTORY STATISTICS

Success at statistics and other quantitative courses generally requires a somewhat special strategy on the part of students. Here are a few suggestions to consider.

1. *Work at it*. This might seem obvious, but generally people underestimate how much effort and hard work is required to learn statistical material. It is not simply a matter of reading, which itself can be challenging because of new symbols (what does that Σ mean?) and the somewhat cryptic writing style. In addition to reading carefully, developing your understanding of and (especially) your ability to apply statistical knowledge generally requires that you work through multiple problems.

2. *Work regularly from the start of the course*. Statistical material is cumulative in nature. That is, understanding material earlier in the course is often essential for understanding material presented later in the course. Unless you have learned the earlier work, you will have much difficulty understanding the later work. And as noted in item 1, it can sometimes take considerable effort to learn statistical material.

3. *Work with other students in groups*. Courses like statistics often benefit from working with other students in the class. This gives you someone to talk through your difficulties with and often that is enough (even if all of the students initially are equally confused about the material). Working with other students also helps to ensure that you are working regularly at the course and can be a great motivator. The saying, "Misery loves company", was probably written by someone taking a statistics course!

4. *Seek help as soon as you feel the need for it*. In some courses students can let a lack of understanding slide for awhile, and wait for enlightenment to occur. But this strategy is not a good one in quantitative courses because, as noted above, later material depends on earlier material. Ignoring your difficulties early on can create much more serious difficulties in short order. So once you have difficulty, try to clear it up ... reread the material, try more problems, talk to other students, ask the professor in lecture about it (you can bet other students are having difficulty as well, and they will appreciate your question), or visit the professor, lab instructor, or teaching assistants during office hours (or request an appointment).

5. *Attend to the specific details*. Some things might seem minor to you at first, but should not be ignored. Learn the names for symbols and operations so that you have a vocabulary to talk yourself through the concepts and calculations. For example, $\Sigma(x - \mu) = 0$ is much more meaningful to read when you know that Σ is called *sigma* and represents addition or summation, and μ is called *mu* and represents the mean. Also learn specifics about your calculators (e.g., how to use its memory to accumulate squared numbers). Attending to seemingly minor details can be very helpful in a course like statistics.