

# PSYC\*1010 (Section 02), Course Outline: WINTER 2020

## General Information

**Course Title: Making Sense of Data in Psychological Research**

**Course Description:** This course introduces research designs and quantitative approaches used in psychological science, with an emphasis on conceptual understanding. Specific topics include distributions, meta-analysis, confidence intervals and p-values, effect size, and regression, as well as the differences between descriptive, correlational, and experimental research designs.

The goals of this course are to provide: 1) sufficient knowledge of statistics so that you may critically evaluate claims based a statistical argument; and 2) the statistical tools you need to carry out your own empirical research. The course begins with descriptive statistics (techniques of summarizing or describing research findings) and progresses to inferential statistics (techniques for making predictions about populations based on findings from samples).

To succeed in this course, it is essential that you keep up with the readings and homework. Effective time management is critical. The grade assessments include online homework and quizzes, a brief report, in addition to two midterm exams and a final exam. Online materials include graded adaptive learning exercises and assessment quizzes that are accessible via the LaunchPad link on the course homepage. You should take a disciplined approach, attend lectures, keep up with the readings in the textbook, complete the LaunchPad assignments, and make sure to ask questions when you are struggling.

Although a significant part of the course entails numerical calculations (you may use a stand-alone calculator), a major aim of the course is to develop an understanding of which statistical procedures are appropriate for different research designs. The statistical procedures are tools that guide researchers' conclusions about research questions. Thus, you will develop critical thinking skills (e.g., ability to analyze and evaluate an argument), and communication skills (e.g., writing, listening, and note-taking skills).

**Credit Weight: 0.5**

**Academic Department (or campus): Psychology (University of Guelph)**

**Semester Offering: Winter 2020**

**Class Schedule and Location:**

Mondays, Wednesdays, and Fridays

9:30 – 10:20 am

RICH 2520

## Instructor Information

Name: Anna Dawczyk, Ph.D.

Email: [adawczyk@uoguelph.ca](mailto:adawczyk@uoguelph.ca)

Office location and office hours: TBD and by appointment only

## **GTA Information**

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## **Course Content**

### **Specific Learning Outcomes (LOs):**

The purpose of this course is to introduce students to research designs and qualitative approaches used in psychological science, with an emphasis on conceptual understanding. By the end of this course, students will be able to:

1. Display Knowledge Acquisition of Core Concepts and Express Critical Thinking by:
  - a. Describing and applying the core concepts of the scientific method, research methods, and statistics;
  - b. Formulating questions about psychology, evaluating hypotheses based on statistic tests, analyzing correlational and experimental data, and recognizing the importance of supporting statements with evidence; and
  - c. Identifying questions and issues, create a plan to address them, and apply research methods and statistical knowledge to resolve the question or issue.
2. Demonstrate Literacy by:
  - a. Recognizing and describing basic research methodologies (e.g., random assignment, random sampling), understanding why numerical data is used and how to apply it, and demonstrating the ability to compute statistics and interpret data to test a claim;
  - b. Understanding and identifying appropriateness of methodologies in different contexts, and statistical tests, and;
  - c. Creating and interpreting graphs and tables, and evaluating the appropriateness of the content and their sources (e.g., discern when a graph is misleading).
3. Appropriately Communicate by:
  - a. Applying university-level reading comprehension to acquire information;
  - b. Presenting ideas in a logical order and using concrete examples and visual representations of data (e.g., graphs, tables) to illustrate points; and
  - c. Using key concepts when presenting statistical results.
4. Show Ethical Behaviour by:
  - a. Describing ethical principles in conducting and disseminating research as it relates to accurate (non-misleading) presentation of research results.

**Lecture Content:**

<b>Date</b>	<b>Readings</b>	<b>Assessments</b>
Week 1: Jan. 6, 8, 10	Chapter 1: Introduction to Statistics and Research Design	Appendix A (math review) Learning Curve Quiz 1 Due: Jan. 19
Week 2: Jan. 13, 15, 17	Chapter 2: Frequency Distributions Chapter 3: Visual Displays of Data	Learning Curve Quiz 2 and 3 Due: Jan. 19
Week 3: Jan. 20, 22, 24	Chapter 4: Central Tendency and Variability	Learning Curve Quiz 4 Due: Jan. 26
Week 4: Jan. 27, 29, 31	Chapter 5: Sampling and Probability	Learning Curve Quiz 5 Due: Feb. 2
Week 5: Feb. 3, 5, 7	Chapter 6: The Normal Curve, Standardization, and z Scores	Learning Curve Quiz 6 Due: Feb. 9
Week 6: Feb. 10, 12, 14	Chapter 7: Hypothesis Testing with z Scores	<b>Feb 10: Midterm 1 (chapters 1-6)</b>  Learning Curve Quiz 7 Due: Feb 16
Feb. 17 – 21:	<b>Winter Break</b>	
Week 7: Feb. 24, 26, 28	Chapter 8: Confidence Intervals, Effect Size, and Statistical Power	Learning Curve Quiz 8 Due: Mar. 1
Week 8: Mar. 2, 4, 6	Chapter 9: The Single-Sample $t$ Test and the Paired-Samples $t$ Test	Learning Curve Quiz 9 Due: Mar. 8
Week 9: Mar. 9, 11, 13	Chapter 10: The Independent-Samples $t$ Test	Learning Curve Quiz 10 Due: Mar 15
<b>Date</b>	<b>Readings</b>	<b>Assessments</b>
Week 9: Mar. 9, 11, 13	Chapter 10: The Independent-Samples $t$ Test	Learning Curve Quiz 10 Due: Mar 15
Week 10: Mar. 16, 18, 20	Chapter 13: Correlation	<b>Mar. 16: Midterm 2 (chapters 7-10)</b>  Learning Curve Quiz 11 Due: Mar 22

Date	Readings	Assessments
Week 11: Mar. 23, 25, 27	Chapter 14: Regression	Learning Curve Quiz 12 Due: Mar 29
Week 12: Mar. 30, Apr. 1, 3	Chapter 15: Chi-Square Tests	<b>Due Apr 5: Stats in the Media</b>  Learning Curve Quiz 13 Due Apr. 5

**Labs: None**

**Seminars: None**

**Additional note:**

SPSS statistical software references in the textbook will not be examined. Students may download the program if interested in learning independently. Some statistical software solutions will be demonstrated in class, but students are not expected to carry out similar solutions for this course.

**Course Assignments and Tests:**

Assignment or Test	Due Date	Contribution to Final Mark (%)	LOs Assessed
Learning Curve on Launchpad for Nolan & Heinzen (4 <sup>th</sup> Ed.)	Weekly assignments due by 11:59 pm on the Sunday of the corresponding week.	5% (Based on the 10 best scores; 10 at 0.5% each)	1 a-c; 2 a-c; 3 a-3; 4a
Quizzes on Launchpad for Nolan & Heinzen (4 <sup>th</sup> Ed.)	Weekly assignments due by 11:59 pm on the Sunday of the corresponding week.	15% (Based on the 10 best scores; 10 at 1.5%)	1 a-c; 2 a-c; 3 a-3; 4a
<b>Research Participation</b> (any combination of SONA research participant pool or written summary of up to five research articles)	Last week of class (see SONA information on Courselink)	5%	1 a-c; 2 a-c; 3 a-3; 4a
<b>Midterm 1</b>	Mon Feb 10 (in-class)  Chapters 1 – 6	18%	1 a-c; 2 a-c; 3 a-3; 4a
<b>Midterm 1</b>	Mon Mar 16 (in- class)  Chapters 7 – 10	18%	1 a-c; 2 a-c; 3 a-3; 4a

Assignment or Test	Due Date	Contribution to Final Mark (%)	LOs Assessed
Statistics in the Media	Sun Apr 5 via CourseLink (encouraged to submit earlier)	14%	1 a-c; 2 a-c; 3 a-3; 4a
Final Exam	Mon Apr 20, 19:00 – 21:00	25%	1 a-c; 2 a-c; 3 a-3; 4a

**Final examination date and time:** Monday April 20, 19:00 – 21:00

**Final exam weighting:** 25%

### Course Resources

#### **Required Texts:**

Nolan, S. A., & Heinzen, T. E. (2019). *Essentials of Statistics for the Behavioral Sciences* (4th ed.). New York: Worth Publishers.

Note: The text is available in hard-copy and as an e-book. Students are required to purchase one of the text options. Both options come with Launchpad.

One copy of the text is available through the library course reserve.

**Recommended Texts: none**

**Lab Manual: none**

#### **Other Resources:**

1. CourseLink: Lecture slides will be provided on the CourseLink website.
2. Launchpad software (included with the Nolan & Heinzen text) is used to provide the Learning Curve exercises and quizzes that are graded.

Content on CourseLink includes a file called *Launchpad Registration Guide* that walks you through the directions.

**Field Trips: none**

**Additional Costs: none**

## **Course Policies**

**Attendance.** Regular attendance at lectures is strongly recommended. Although lectures will closely follow the presentation in the textbook, many students find the material very challenging. Lectures may include discussion of end of chapter exercises for which answers are not provided in the textbook. My goal is to communicate key concepts in a clear and uncomplicated fashion so that students are not intimidated by the statistical underpinnings of research in psychology.

## **Grading Policies**

**Weekly Launchpad Learning Curve Assignments.** To succeed in this course, you must do the assigned textbook readings and complete the assessments. You should plan to spend at least 7 hours in addition to class time doing your readings and assessments. The Launchpad Learning Curve program provides an adapted learning opportunity to test your knowledge of the material. You may proceed through the exercises at your own pace until you achieve mastery. The deadline to receive grades on the Learning Curve assignment is 11:59 pm on the Sunday at the end of the assigned week. Your 10 best scores will each count toward 0.5% of your final grade. That is, this assignment counts toward 5% of the final grade.

**Weekly Launchpad Quizzes.** There is a multiple-choice quiz for each assigned chapter in the textbook. Similar questions will also appear on the midterms and final exam. You should not begin a quiz until you have mastered the corresponding Learning Curve assignment first. Each quiz has a time limit of 30 minutes. You must complete the quiz by 11:59 pm of the corresponding week. Your overall quiz grade will be based on the best 10 marks. Each of the 10 best quiz marks will count toward 1% of the final grade for a total contribution of 10%. Once the deadline has passed, you will be able to review the incorrect items on your quiz (at this point you may attempt the quiz again but it will not be graded).

**Research Participation Assignments (SONA).** One of the best ways to learn about research is to participate. In particular, there are special benefits for quantification students because participation will give you a chance to see how the concepts of this course are applied in actual research projects that are being carried out at the University of Guelph. Furthermore, if you choose to continue on in Psychology, you may one day be carrying out your own research as part of an undergraduate honours thesis, research internship, or research project. Consequently, you may enjoy talking to more senior students in the Psychology program, either upper year undergraduates students, graduate students, or research interns/assistants. You may earn up to 5% toward your final grade for participating in the psychological studies occurring in the department (advertised in the SONA network).

There are also options for those who choose not to participate in a study. If you prefer not to participate in a study or if there are no studies available on the SONA network, you may choose the option of reading published journal articles that will be made available on the SONA website (address listed below). Specifically, for each of the 5 credits participation you will need to read one of the articles on Courselink and write a summary for each in the format described under "Alternative Assignment" tab on the SONA website.

Thus, there are two types of research participation assignments based on: (a) actual research participation and (b) reading published articles on Courselink and writing the required summary. Many of you will find that you end up doing both types of assignment to make up your 5% for the Research Participation mark. For example, you may have 3% based on participation in 3 hours of experiments and another 2% on summaries from 2 of the articles posted on the [SONA website](#). All research participation and papers are due by no later than 11:59 on the last day of scheduled classes. It is a good idea to spread these out over the term so that you are not overwhelmed at the end of the year.

For specific details about this assignment, go to:

<https://www.uoguelph.ca/psychology/research/sona>

### **Statistics in the Media**

In self-selected groups of 5-6 students, your group will submit a brief report on statistics in the media by first identifying an example of a statistical research finding presented in recent (early 2020) mainstream media (e.g., newspaper, magazine, podcast, TV, etc.), and then by locating the original study or peer-reviewed journal article that was discussed in the media source. Based on the information presented in the media source and the original study, students will describe the research question(s) and hypotheses, identify the independent and dependent variable(s), describe the study design, summarize the conclusions, and identify any pertinent information in the actual study that was excluded from the media source. Detailed assignment instructions are available on Courselink.

**Mid-Term Exams and Final Exams.** The two midterm exams and the final exam will comprise multiple-choice questions similar to those on the weekly quizzes. Note that each student must take all three exams. In the event that you miss a midterm exam due to documented medical, psychological or compassionate reasons, then the score on that missed midterm will be calculated as the average percentage grade of your completed midterm and final exam. *There will be NO makeup midterm exams.*

### **Course Policy on Group Work:**

Each student is expected to complete Learning Curve assignments, online quizzes, and exams on his or her own. If there is evidence that students are collaborating while completing online assessments, then those cases will be dealt with as per the regulations on *Academic Misconduct*. However, students are encouraged to form study groups in preparation for the graded assessments.

### **Course Policy on the Use of Electronic Devices and Recording of Lectures:**

Electronic recording of classes is expressly forbidden without consent of the instructor. When recordings are permitted, they are solely for the use of the authorized student and may not be reproduced, or transmitted to others, without the express written consent of the instructor.

## **University Policies**

### **Academic Consideration**

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor in writing, with your name, id#, and e-mail contact. See the academic calendar for information on regulations and procedures for [Academic Consideration, Appeals and Petitions](#)

### **Academic Misconduct**

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community, faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring.

University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to, and the right to use, electronic and other means of detection. Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar: [Academic Misconduct Policy](#)

### **Accessibility**

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact [Student Accessibility Services](#) (SAS) as soon as possible.

For more information, contact SAS at 519-824-4120 ext. 54335 or email [accessibility@uoguelph.ca](mailto:accessibility@uoguelph.ca) or the [Student Accessibility Services Website](#)

### **Course Evaluation Information**

Please refer to the [Course and Instructor Evaluation Website](#)

### **Drop Date**

The last date to drop one-semester courses, without academic penalty, is April 03, 2020. For regulations and procedures for Dropping Courses, see the [Schedule of Dates in the Academic Calendar](#). Instructors must still [provide meaningful and constructive feedback to students prior to the 40<sup>th</sup> class](#) day. [Current Undergraduate Calendar](#)