

## **PSYC\*1010 (Section 01), Course Outline: Winter 2023**

### **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).

Although a significant part of the course entails numerical calculations (you may use a stand-alone calculator, Microsoft Excel, or statistical software), 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:** 0.50

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

**Semester Offering:** F22

**Class Schedule and Location:** Mon, Wed, Fri, 11:30-12:20 PM, RICH 2520

**All course related material must be accessed through Courselink.**

### **Instructor Information**

Instructor Name: Danny M. Pincivero, PhD

Instructor Email: [dpinci@uoguelph.ca](mailto:dpinci@uoguelph.ca)

Office hours: Appointment by email.

### **Graduate Teaching Assistant Information**

- Graduate teaching assistant information will be provided on Courselink.

## Course Content

### **Specific Learning Outcomes:**

#### A. Critical and Creative Thinking

##### 1. Depth and Breadth of Knowledge

- Describe core concepts in the scientific method, research methods and statistics, and indicate how these ideas work together in the scientific method.
- Understand and apply key concepts in research methods and statistics as it relates to the scientific method.

##### 2. Inquiry and Analysis

- Formulate questions about psychology.
- Know how to find relevant evidence.
- Evaluate hypotheses based on data.
- Recognize the importance of supporting statements with evidence.

##### 3. Problem Solving

- Identify issues and create a plan to address the problem using knowledge of research methods and statistics.

#### B. Literacy

##### 4. Methodological literacy

- Recognize and describe basic research methodologies (e.g., random assignment, random sampling; qualitative vs. quantitative methods).

##### 5. Quantitative literacy

- Understand the use of numerical data.
- Demonstrate the ability to interpret data (including formulas).
- Demonstrate ability to analyze data (perform calculations) and interpret data to test a claim.
- Use quantitative data as evidence for claim.

##### 6. Visual literacy:

- Use graphs, tables and images and visual images and their source.
- Evaluate images and their source (e.g., discerning when a graph is misleading).

#### C. Communication

##### 7. Reading Comprehension (e.g., reading the text materials)

- Read at a university level, acquiring psychological information.
- Understand sophisticated theoretical and empirical writing in psychology.

##### 8. Listening skills (a component of Oral communication).

- Determine the key points in an auditory presentation (on the fly) by listening.
- Summarize information in a clear and concise way so that you can later access the information.
- Ask questions of the speaker when you require clarification.

##### 9. Written Communication

- Explain complex abstract processes in simple, clear, and jargon-free language,

presenting ideas in a logical order, using concrete examples, and diagrams, graphs when necessary (see Visual literacy).

- Write clearly and demonstrates general psychological knowledge when presenting ideas.
- Write using the appropriate vocabulary, presenting statistical results in APA format (American Psychological Association, the standard format for psychological research).

#### D. Personal and ethical behaviour

##### 10. Ethical issues in research

- Describe ethical principles in conducting research as it relates to the accurate (non-misleading) presentation of research results.

##### 11. Personal organization/ time management

- Deal with intense time pressures, prioritizes and complete important or urgent tasks to schedule, starts task early rather than waiting until the deadline.
- Cope with time pressures without panicking, by being strategic, and determining a way to get the best results in a limited amount of time.
- Demonstrate personal accountability and responsibility.

On successful completion of this course, you will be able to accomplish the following:

A. Identify and describe key concepts in quantitative psychology, including those relating to the scientific method, research design, and inferential and descriptive statistics. Apply these concepts when solving problems (Learning outcomes: 1, 3- 5, 7-9)

B. Describe the stages involved in scientific reasoning and specify the role and importance of quantification in the scientific method (the scientific reasoning process). Use an example of your own creation to help you explain how this process works. (Learning outcomes: 1, 2, 4, 8-9)

C. Identify the weak points within scientific arguments (places where error can enter), and the places where an individual could lie or mislead using statistics or the graphical (Learning outcomes: 1-6, 8-9)

D. Analyze a research question, identifying the relevant measured and manipulated variables and the scale of measurement for variables. Indicate whether the study is a true experiment, a quasi-experiment, or correlational design and describe the relative strengths and weaknesses of each type of design. (Learning outcomes: 1-3, 7-9)

E. Identify the independent and dependent variables in true and quasi-experiments, being sure to report the measures in terms of how they are measured or manipulated (operational definitions). Identify the relevant variables in a correlational study, describing each variable in terms of how it is measured. (Learning outcomes: 1-5)

F. Describe the differences between descriptive and inferential statistics, indicating when each would be used. Determine the appropriate form of statistical analysis for simple experiments. This involves choosing the correct descriptive and inferential statistic. (Learning outcomes: 1-5, 7-9)

G. Create and graph frequency information (frequency distributions). Calculate measures of central tendency (mean, median, mode) and variability (e.g., range, standard deviation, variance). Explain the meaning and importance of these measures, using jargon-free language and concrete examples of your own creation. (Learning outcomes: 1, 3-9)

H. Interpret information that is presented in graphical format (graphs). Create graphs for frequency distributions, true and quasi-experiments, and correctional studies. (Learning outcomes: 6)

I. Explain what hypothesis testing is, indicating its purposes, the processes involved, and the places where error can enter into the process using jargon-free language and concrete examples of your own creation. Indicate the role of probability in hypothesis testing and inferential statistics. Note: This involves knowing how to define probability and inferential statistics in your own words. (Learning outcomes: 1-9)

J. Carry out hypothesis testing using z-tests, t-tests, and Pearson correlation. (This involves calculating the statistic as well using the result in decisions and presenting the result in writing in APA format). Indicate what statistical significance means and indicate how this is related to effect size and statistical power. Note: This means you will have to be able to describe what each concept means in simple jargon-free language, using a concrete example of your own creation to explain what you mean. (Learning outcomes: 1-9)

K. Describe how statistics can be used to mislead and what honest researchers do to avoid misleading others when presenting data about the results of study. (Learning outcomes: 10)

L. Plan your work across the term so that you complete the assignments on time. Start assignments early so you will not have to rush. Note that steady effort is required, and it is important to create a calendar in advance where you save your deadlines. Deal with time pressures in exams, learning how to prioritize and be strategic in order to make the best of limited time. (Learning outcome: 11)

## Content and Deadlines:

DATE	LECTURE TOPIC	READINGS	ACTIVITY
<b>WEEK 1</b> Jan 9-13	<b>UNIT 1: Introduction to quantitative research</b>	Chapter 1	
<b>WEEK 2</b> Jan 16-20	<b>UNIT 2: Descriptive statistics</b>	Chapters 2-4	<b>QUIZ 1 (UNITS 1&amp;2)</b>
<b>WEEK 3</b> Jan 23-27	<b>UNIT 3: Probability</b>	Chapter 6	<b>QUIZ 2 (UNIT 2)</b>
<b>WEEK 4</b> Jan 30-Feb 3	<b>UNIT 4: The Normal Distribution</b> <b>MIDTERM TEST #1: UNITS 1-3</b>	Chapter 5	
<b>WEEK 5</b> Feb 6-10	<b>UNIT 5: Confidence intervals</b>	Chapter 7-8	<b>QUIZ 3 (UNIT 5)</b>
<b>WEEK 6</b> Feb 13-17	<b>UNIT 6: Hypothesis testing with one sample</b>	Chapter 9	
<b>WEEK 7</b> Feb 20-24	<b>WINTER BREAK (no classes)</b>		
<b>WEEK 8</b> Feb 27-March 3	<b>UNIT 7: Hypothesis testing with two samples</b> <b>MIDTERM EXAM #2: UNITS 4-6</b>	Chapter 10	
<b>WEEK 9</b> March 6-10	<b>UNIT 7: Hypothesis testing with two samples</b>	Chapter 10	<b>QUIZ 4 (UNIT 7)</b>
<b>WEEK 10</b> March 13-17	<b>UNIT 8: Analysis of variance (ANOVA)</b>	Chapter 13	
<b>WEEK 11</b> March 20-24	<b>UNIT 8: Analysis of variance (ANOVA)</b>	Chapter 13	<b>QUIZ 5 (UNIT 8)</b>
<b>WEEK 12</b> March 27-31	<b>UNIT 9: Linear regression and correlation</b>	Chapters 15-16	
<b>WEEK 13</b> Apr 3-7	<b>UNIT 9: Linear regression and correlation</b>	Chapters 15-16	
<b>WEEK 14</b> <b>Apr 10</b>	Final exam review Last day of class		

**NOTE:** The instructor reserves the right to modify the schedule of topics above. Every effort will be made to adhere to this schedule as close as possible.

## Course Assignments and Tests:

Assignment or Test	Due Date	Contribution to Final Mark (%)	Learning Outcomes Assessed
Online quizzes	Please refer to course schedule	10%	1-11
Midterm Exam 1	<b>Wednesday February 1 UNITS 1-3</b>	20%	1-11
Midterm Exam 2	<b>Wednesday March 1 UNITS 4-6</b>	20%	1-11
Final Exam	<b>DATE TBA UNITS 7-9</b>	20%	1-11
Homework assignments	<b>Please see homework assignment guidelines on Courselink</b>	30%	1-11

## Course Resources

### Required Text:

Gravetter, F.J., & Wallnau, L.B. (2017). Statistics for the Behavioural Sciences, 10e edition. Cengage.

### Other Resources:

Additional resources will be provided on Courselink.

For the midterm and final examination, you will need to download the Respondus Lockdown Browser. <https://download.respondus.com/lockdown/download.php?id=273932365>

## Course Requirements

### Online Quizzes (2% each x 5 = 10% of final grade)

- The online quizzes will be made available on Courselink and will become available on the **Friday at 12:00 PM (noon)** of the scheduled week and will remain open through **Friday** of the following week and will close at **11:30 AM**.
- **IMPORTANT NOTE:** All the quizzes are to be completed during the allocated time of availability in Courselink. Missed quizzes CANNOT be made up and under no circumstances will the percent value of a missed quiz be shifted to any other quiz, assignment, or exam. It is the student's responsibility to ensure that they have adequate computer/internet resources in place at the time they intend on completing the quiz. The online quizzes WILL NOT use the Respondus Lockdown Monitor.

### Midterm Exams (2 x 20%)

- The midterm exams will be comprised of multiple-choice and short answer questions. **Respondus lockdown browser will be in effect.**

### Final Exam (20%)

- The final exam (TBA) may be comprised of multiple-choice and short-answer questions. The final exam will NOT be cumulative.

### Homework assignments (30%)

- Please refer to Courselink for details on the homework assignments.

## **Respondus lockdown browser may be in effect.**

Respondus LockDown Browser is a locked browser for taking quizzes in CourseLink. It **may** be required to take the midterms and final exam. It prevents you from printing and copying; using other operating software; using search engines (e.g., going to another URL); communicating via instant messaging; and it blocks non-web-related software (e.g., Adobe PDF, Microsoft Word).

Respondus Monitor is a companion application for LockDown Browser that uses webcam and video technology to ensure academic integrity during online exams. The software captures video during the exam and allows the instructor to review the video once the exam is completed.

In order to use Respondus LockDown Browser and Monitor, you must meet the following technical requirements so that you can take the practice test and midterm exam:

1. Operating Systems: Windows 10, 8, 7; Mac OS X 10.10 or higher.
2. Memory: Windows 2 GB RAM; Mac 512 MB RAM.
3. For Mac users: Safari must function properly on the computer.
4. Mac users must have Adobe Flash Player installed to Safari, even if a different browser is normally used.
5. Functioning webcam and microphone. The webcam and microphone can be built into your computer or can be the type that plugs in with a USB cable. (You will be required to do an environment scan of your room, so please ensure you can move your computer, laptop or webcam for this scan.)
6. A broadband Internet connection. It is recommended that you access the Internet via a wired connection.

If you have any concerns about meeting system requirements, contact CourseLink Support. They will work with you to find alternative solutions or make alternative arrangements.

- This course requires the use of Respondus LockDown Browser and Monitor (webcam) for proctoring within CourseLink. You must **download and install LockDown Browser and Monitor** to complete the practice test (if provided) and course exam(s). The purpose of the practice test is to ensure that Respondus LockDown Browser and Monitor is set up properly and that you are comfortable using the software.
- Respondus LockDown Browser is a locked browser connected to the Quizzes tool in CourseLink. It prevents you from printing and copying, using other operating software, using search engines (e.g., going to another URL), communicating via instant messaging, and it blocks non-web-related software (e.g., Adobe PDF, Microsoft Word).
- Respondus Monitor is a companion application for LockDown Browser that uses webcam and video technology to ensure academic integrity during online exams. The software captures video during the exam and allows the instructor to review the video once the exam is completed.
- In order to use Respondus LockDown Browser and Monitor, you must meet the **technical requirements**. Visit the Remote Learning website for guidance on **preparing your online exam environment**.
- If you have any concerns about meeting system requirements, contact **CourseLink Support**. They will work with you to find alternative solutions or make alternative arrangements.

**Effective time management is critical.** To succeed in this course, it is essential that you keep up with the readings, weekly learning curve, quiz and research in action activities. You should take a disciplined approach in planning to complete the graded assignments. You are encouraged to ask questions when you are struggling.

### **Late or missed deadlines:**

**Midterm exams.** If a student misses the midterm exam due to medical, psychological or compassionate reasons, then the midterm exams may be re-scheduled. If a student fails to provide appropriate grounds for academic consideration, the grade on the missed midterm will be 0.

**Final exam.** Students who do not write the final examination should follow the University's procedures for requesting academic consideration (see below).

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

Each student is expected to complete all assignments on their own. If there is evidence that students are collaborating while completing any 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 regarding 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.

Similarly, any material created by the course instructor is intended for those enrolled in this course solely. Under no circumstances are you allowed to disseminate course materials to external parties.

## **Student Rights and Responsibilities when Learning Online**

### *Online behaviour*

According to the University Secretariat, students have a responsibility to help support community members' access to the tools they need to engage in their learning and development, both in and outside of the classroom. An example of this type of responsibility is the requirement to abide by the following:

Section 4.3.3. Disruption - to not interfere with the normal functioning of the University, nor to intimidate, interfere with, threaten or otherwise obstruct any activity organized by the University, including classes, or to hinder other members of the University community from being able to carry on their legitimate activities, including their ability to speak or associate with others.

As such, appropriate online behaviour will not be tolerated. Examples of inappropriate online behaviour include

- Posting inflammatory messages about your instructor or fellow students
- Using obscene or offensive language online
- Copying or presenting someone else's work as your own
- Adapting information from the Internet without using proper citations or references
- Buying or selling term papers or assignments
- Posting or selling course materials to course notes websites
- Having someone else complete your quiz or completing a quiz for/with another student

- Stating false claims about lost quiz answers or other assignment submissions
- Threatening or harassing a student or instructor online
- Discriminating against fellow students, instructors and/or TAs
- Using the course website to promote profit-driven products or services
- Attempting to compromise the security or functionality of the learning management system
- Sharing your username and password

### **University Policies**

For information on current safety protocols, follow these links: <https://news.uoguelph.ca/return-to-campuses/how-u-of-g-is-preparing-for-your-safe-return/>

<https://news.uoguelph.ca/return-to-campuses/spaces/#ClassroomSpaces>

Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives

### **Disclaimer**

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via CourseLink and/or class email. This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (<https://news.uoguelph.ca/2019-novel-coronavirus-information/>) and circulated by email.

### **Illness**

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g., final exam or major assignment).

### **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:

[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](#) 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 10, 2022. For regulations and procedures for Dropping Courses, see the [Schedule of Dates in the Academic Calendar](#).

Instructors must provide [meaningful and constructive feedback, at minimum 20% of the final course grade, prior to the 40th class day](#). For courses which are of shorter duration, 20% of the final grade must be provided two-thirds of the way through the course.

[Current Undergraduate Calendar](#)

### **Additional Course Information: Turnitin software**

Course instructors are allowed to use software to help in detecting plagiarism or unauthorized copying of student assignments. Plagiarism is one of the most common types of academic misconduct on our campus. Plagiarism involves students using the work, ideas and/or the exact wording of other people or sources without giving proper credit to others for the work, ideas and/or words in their papers. Students can unintentionally commit misconduct because they do not know how to reference outside sources properly or because they don't check their work carefully enough before handing it in. 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.

In this course, your instructor will be using Turnitin.com to detect possible plagiarism, unauthorized collaboration or copying as part of the ongoing efforts to prevent plagiarism in the College of Social and Applied Human Sciences.

A major benefit of using Turnitin is that students will be able to educate and empower themselves in preventing misconduct. In this course, you may screen your own assignments through Turnitin as many times as you wish before the due date. You will be able to see and print reports that show you exactly where you have properly and improperly referenced the outside sources and materials in your assignment.