

PSYC*1010 Section 02, Course Outline: Fall 2018

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.

Credit Weight: 0.5

Academic Department (or campus): Psychology

Semester Offering: F18

Class Schedule and Location: T/TH 4:00pm to 5:20pm MCKN 117

Instructor Information

Instructor Name: Dr. Scott R. Colwell
Instructor Email: scolwell@uoguelph.ca
Office location: Macdonald Institute Building (MINS) 202A
Office hours: Tuesday 1:00pm to 3:00pm

GTA Information

GTA Name: To be announced on CourseLink.
GTA Email:
GTA office location and office hours:

Course Content

Specific Learning Outcomes:

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 creates a plan to address the problem using knowledge of research methods and statistics

Literacy

4. Methodological literacy: The ability to understand, evaluate, and apply appropriate methodologies for rigorous psychological science
- Recognize and describe basic research methodologies (e.g. random assignment, random sampling, etc.) and how they work together
5. Quantitative literacy:
- Understand the use of numerical data
 - Demonstrate 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)

Personal and ethical behavior

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

- Recognize the importance of planning for completion of tasks
- Deal with intense time pressures, prioritizes and complete important or urgent tasks to schedule.
- 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:

1. 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)
2. 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)
3. 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)
4. 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)
5. 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)
6. 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)
7. 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)

8. Interpret information that is presented in graphical format (graphs). Create graphs for frequency distributions, true and quasi-experiments, and correlational studies. (Learning outcomes 6)
9. 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)
10. Carry out hypothesis testing using z-tests, t-tests, and Pearson correlation. (This involves calculating the statistic as well as using the result in decisions and presenting the result in writing in APA format). Calculate measures of effect size (e.g. Cohen's d , r^2). 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)
11. Describe how statistics can be used to be misled and what honest researchers do to avoid misleading others when presenting data about the results of study. (Learning outcomes 10)
12. Plan your work across the term so that you complete the homework on time and complete the quizzes, the practice exam, and research design assignment on time. 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 and quizzes, learning how to prioritize and be strategic in order to make the best of limited time. (Learning outcomes 11)

These outcomes will be measured in exams, text-based homework, quizzes, and research methods/ design assignments. They will also be achieved by working on the practice exams posted on Courselink.

Lecture Content:

The table below lists the content of the lectures and the associated readings from the text. Please note that these dates are tentative. Although exam dates will not change, it is possible that it may take more or less time to cover the various topics in a given year. Please refer to CourseLink regularly for any changes to the schedule. Note: All quizzes are to be completed online (CourseLink) and will be available at 8:30am on the Monday of the scheduled week and are due by 5pm on the Friday of that week.

Week #: Beginning	Readings	Graded Material Due
Week 1: Sept 6 th	Course introduction	
Week 2: Sept 11/13	Appendix: Basic mathematics review Chapter 1: The role of statistics in the social sciences	Quiz 1 (2.5%)
Week 3: Sept 18/20	Chapter 2: Frequencies, cross tabulations, and graphs	Quiz 2 (2.5%)
Week 4: Sept 25/27	Chapter 3: Measures of Central Tendency, Dispersion and Shape	Quiz 3 (2.5%)
Week 5: Oct 2/4	Chapter 4: Review of probability theory	Quiz 4 (2.5%)
Week 6: Oct 9/11	T: No class - rescheduled for Nov 29 th TH: In-class Test #1	TEST #1 (20%) on Oct 11 th covering chapters 1 – 4
Week 7: Oct 16/18	Chapter 5: The normal curve Chapter 6: Sample distribution versus sampling distribution	Quiz 5 (2.5%)
Week 8: Oct 23/25	Chapter 7: The scientific method and hypothesis testing Chapter 8: Parameter estimation using confidence intervals	Quiz 6 (2.5%)
Week 9: Oct 30 / Nov 1	T: In-class Test #2 TH: Chapter 9: Single sample t-test and z-test	Quiz 7 (2.5%) TEST #2 (25%) on Oct 30 th covering chapters 5 – 8.
Week 10: Nov 6/8	Chapter 10: Independent and paired sample t-test	Quiz 8 (2.5%)
Week 11: Nov 13/15	Chapter 12: Bivariate correlation and regression	Quiz 9 (2.5%)
Week 12: Nov 20/22	Chapter 12: Bivariate correlation and regression	Quiz 10 (2.5%)
Week 13: Nov 27/29	T: Flex day for catch-up TH: Review for final exam	

NOTE: The final examination (30%) will be cumulative, covering chapters 1 – 10 and 12. Approximately 70% of the final examination will focus on the material from chapters 7 – 10 and 12.

Labs: None

Seminars: None

Course Assignments and Tests:

Assignment or Test	Due Date	Contribution to Final Mark (%)	Learning Outcomes Assessed
Online Quizzes	Weekly online quizzes due by 5pm on the Friday of that week	10 @ 2.5% = 25%	1 – 11
In-class Test #1	Oct 11 th covering chapters 1 – 4	20%	1 – 8
In-class Test #2	Nov 1 st covering chapters 5 – 8.	25%	1 – 11

Final examination date and time: Saturday December 8th, 2018 from 2:30pm – 4:30pm.

Final exam weighting: 30%

[Examination Regulations](#)

Course Resources

Required Texts:

Colwell, S.R. & Carter, E.M. (2016). *Introduction to Statistics for Social Sciences*. John Wiley and Sons. ISBN 9781119308089

Note: One copy of this book will be placed on two-hour reserve at the library.

Recommended Texts: None

Lab Manual: None

Other Resources:

Supplementary resources can be found at www.thestatisticalmind.com

Field Trips: None

Additional Costs: None

Course Policies

Grading Policies

1. **CLASS:** To be successful at this course, it is strongly recommended that you attend all lectures. You are responsible for reading the assigned textbook material prior to attending class. Although the lectures will follow the textbook, they will not necessarily cover all of the material in the chapters. Additionally, material not found in the textbook may also be covered during the lecture.
2. **CALCULATOR:** Bring a stand-alone calculator to each class, test and the final examination. **Mobile phones and applications will not be permitted for use as a calculator for tests or the final examination.**
3. **QUIZZES:** All quizzes are to be completed online through CourseLink. Each quiz will be available at 8:30 am of the week indicated in the schedule and will be due by 5:00 pm on the Friday of that week. Each quiz will be closed at the end of the week and grades released. If you do not complete a quiz within the given time, you will be given a grade of zero for that quiz.

There are no make-up quizzes or shifting of missed quiz grades. All 10 quizzes count toward your final grade.

4. **TESTS:** Students are permitted to bring a single double-sided 8x11 (letter size) sheet of paper that includes only formulas to each of the two tests. These formula sheets will be inspected at each test. Notes other than formulas are not allowed and will be confiscated.

There are no make-up tests. Academic consideration will be provided for documented requests for medical, psychological or compassionate reasons as defined in the university guidelines. Note, you will need to provide the appropriate documentation to your instructor. Academic consideration for missing either or both Test #1 or Test #2 will consist of the following:

In the event you miss Test #1, your grade for that test will be calculated as the average of your grade for Test #2 and the Final Examination.

In the event that you miss Test #2, your grade for that test will be calculated as the average of your grade for Test #1 and the Final Examination.

In the event you miss both Test #1 and Test #2, your grade for that test will be calculated as the average of your grade for all 10 quizzes and the Final Examination.

5. FINAL EXAMINATION: Students are permitted to bring a single double-sided 8x11 (letter size) sheet of paper that includes only formulas to each of the two tests. These formula sheets will be inspected at each test. Notes other than formulas are not allowed and will be confiscated.

[Undergraduate Grading Procedures](#)

Course Policy on Group Work:

Each student is expected to complete the quizzes, tests, and final examination on their own. If there is evidence that students are collaborating while completing the quizzes, tests, and/or final examination, then those cases will be dealt with as per the regulations on Academic Misconduct.

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.

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:

[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 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 Friday November 2, 2018. For regulations and procedures for Dropping Courses, see the [Schedule of Dates in the Academic Calendar](#), [Current Undergraduate Calendar](#)