

University of Toledo - Department of Psychology – Spring 2021
PSY 6100/7100-Quantitative Methods in Psychology I
Tuesdays & Thursdays 1:00pm to 2:20pm
<https://utoledo.webex.com/meet/kamala.london>

Instructor: Dr. Kamala London Newton Office: UH 1880B (1 st floor) Telephone: (419) 530-2352 E-mail: kamala.london@utoledo.edu Office hours: (remote) T 11am-1pm F 8-11am by appointment	Teaching Assistant: Ruam Pimentel Office: UH 1069 (1 st floor) E-mail: rfranci7@rockets.utoledo.edu Office hours (remote): M 8:30am-10:30am W 1pm-3pm
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Required Texts

- Field, A. (2018) *Discovering statistics using SPSS* (5th ed.). London: Sage. There are older versions of this around, but the new version does a lot more. Visit his website for much supplemental materials. ([Discovery Statistics](#))
- Additional required readings are listed in the course schedule.
- You'll need a basic calculator.

Required Software

You have two options for accessing SPSS on your home computer. You can download SPSS by going to Myut, account maintenance. If you have troubles downloading SPSS, you can also access it remotely.

Here is a webpage with instructions to install Vlab (VMware Horizon):

<https://www.utoledo.edu/education/centers/carver/tutorials/virtual-lab-installation-windows.html>

Here the place to connect once downloaded VMware.

<https://www.utoledo.edu/it/VLab/>

Prerequisites

Officially, there is no prerequisite for this course; however, you should have a mastery of computational concepts (including basic algebra) and at least one elementary statistics course at the undergraduate level. If you are unsure whether you have the appropriate background make sure to talk with me about appropriate placement during the first week of classes.

Course Description

This course provides a basic understanding of the statistics used most commonly by social scientists. Topics to be covered include summarizing data with graphs and numbers, generalizing from samples to a population, and determining the effect of one variable on another. We will emphasize the interpretation and application of statistics. Even students who say they have “math anxiety” can excel in this class, if they are willing to keep up with the work. This course is the first of a three course series that fulfills the research and statistics requirements. By the end of this class, you will be able to:

1. summarize and organize data,
2. select and calculate an appropriate statistic to decide whether a variable reliably affects another variable, or whether such findings are driven by chance,

3. critically evaluate research findings in scientific journals and in the media,
4. run analyses and interpret output from a statistical software program (SPSS), and
5. possess a basic understanding of statistics that can be built upon in future research design and statistics classes, as well as the foundations needed to conduct and analyze your own studies.

Course Requirements & Evaluation

Attendance. Required, but email if you have to miss due to illness, religious reasons, conference, etc. Please do not use computers for reasons other than class work. Please join our web-ex meeting on time and do not sign out early. I encourage you to avoid multi-tasking during class.

Cheating. Don't. If you are planning on cheating see me beforehand to discuss the penalties.

Class participation. You will be expected to read the assigned chapters and/or readings before each class period. Each class session will entail some lecture and some discussion. You will be expected to show thoughtful and critical understanding of the assigned readings in your class participation. Reading the material beforehand is essential; it will make the material in lectures easier to understand and will ensure the pace of the class can move along. I highly encourage questions, especially if aspects of the reading were confusing. Your class participation will be your opportunity not only to ask questions, but to demonstrate your understanding of the assigned reading.

Video presentations and how-to handouts. You will sign up for two SPSS topics to present to the class. Presentation length will vary and will entail demonstrating to the class how to run some statistical procedure. Your presentation should be accompanied by a brief one page (in whatever format you think best facilitates learning) how-to page to post for the class. We should discuss your presentation before giving it, either after class or in office hours. A brief video recording should be provided to me in advance of the class meeting.

Homework assignments. The best way to grasp statistical concepts is to use them. After discussing each concept, I will give you a data set to explore to get some practical experience with the concepts. Your grasp of these concepts will be demonstrated on 10 homework assignments; your top 8 grades on these assignments will count toward your course grade.

Examinations. Your knowledge of the bigger picture, how the various course concepts work together, will be tested on three examinations. The format of the exams (largely essay) will be discussed in greater detail in class. You will have one week to complete the exams.

Grading Policy. Each assignment will contribute toward your final grade as follows:

Assignment	Approx. Weight	Total Possible Points
3 exams- 45 pts each	45%	135
Homework assignments (8 of 10 at 11 pts each)	30%	88
Class presentations and handouts	15%	46
Class attendance & participation	10%	31
Total		300

Course grades are determined using the following standard system:

93-100 A	87-89 B+	77-79 C+	67-69 D+	0-59 F
90-92 A-	83-86 B	73-76 C	63-66 D	
	80-82 B-	70-72 C-	60-62 D-	

Class Policies

- No cell phones or other electronic devices (except calculator). Please turn them off.
- Classroom citizenship (i.e., following classroom policies) during graduate courses is a big part of training and is a reflection of professional behavior. Please follow these policies. I reserve the right to ask students in violation of class policies to leave the class. Students with more than three total violations may be asked to drop the course or receive an “F”.

Changes to Syllabus

The information in this syllabus is subject to change. You are responsible for all announcements.

Tentative Schedule

Week	Date	Topic	Reading	Assignment
1	Jan 19	Introduction, syllabus, course overview; Basic concepts	preface	
	Jan 21	Basic concepts/ SPSS	F: 4; Skim 1 & 2	
2	Jan 26	Graphs**	F: 5; Look at http://www.edwardtufte.com/tufte/	
	Jan 28	Average**	F: 1.8.1-1.8.4; Gould (1985); Reese (2005)	HW 1 due
3	Feb 2	Variability**	F: 1.8.5-1.8.7	HW 2 due
	Feb 4	Exploring assumptions	F: 6.1-6.10; Bland & Altman on transformations here .	
4	Feb 9	Correcting problems with data	F: 6.10-6.15	HW 3 due
	Feb 11	Catch up and review		Exam 1 due
5	Feb 16	Instructional break		
	Feb 18	Normal Distribution, Z scores, & probability**	Howell: 4	
6	Feb 23	Sampling distributions	Go online	HW 4 due
	Feb 25	Hypothesis testing	F: 3; Cohen (1994); Wilkinson et al., 1999	
7	Mar 2	t tests	F: 9.1-9.4	
	Mar 4	t tests	F: 9.5-9.13	HW 5 due
8	Mar 9	Power	Baguley (2004)	
	Mar 11	ANOVA 1	F: 11.1-11.3	
9	Mar 16	ANOVA 2: Planned comparisons & post hoc tests	F: 11.4-11.14	HW 6 due

	Mar 18	2-way ANOVA	F: 14	
10	Mar 23	Interpreting interactions		HW 7 due
	Mar 25	Repeated measures ANOVA	F: 15	
11	Mar 30	Correlation	F: 8.1-8.4	HW 8 due
	Apr 1	Correlation	F 8.5-8.11	
12	Apr 6	Regression		
	Apr 8	Traditional non-parametric approaches	F: 7	HW 9 due
13	Apr 13	Categorical data – Chi-square	F 19.1-19.8	
	Apr 15	Chi-square		
14	Apr 20	Robust methods (bootstrapping)	Field et al., 2011	HW 10 due
	Apr 22	Catch up and review		
15	Apr 27	Open Science	Read APA overview and pick 2 articles from list below	

** Please note the four class sessions highlighted will be meeting at <https://utoledo.webex.com/meet/kristina.todorovic> rather than our usual meeting room.

Supplemental Readings

Baguley, T. (2004). Understanding statistical power in the context of applied research. *Applied Ergonomics*, 35, 73-80.

Cohen, J. (1994). The earth is round ($p < .05$). *American Psychologist*, 49, 997-1003.

Gould, S.J. (1985). The median isn't the message. *Discover*, 6 (June), 40-42.

Reese, R.A. (2005). Boxplots. *Significance*, 2, 134-135.

Wilkinson, L. and the Task Force on Statistical Inference, APA Board of Scientific Affairs (1999). Statistical methods in psychology journals: Guidelines and explanations. *American Psychologist*, 54, 594-604.

Wright, D.B., London, K., & Field, A. (2011). Using Bootstrap Estimation and the Plug-In Principle for Clinical Psychology Data. *Journal of Experimental Psychopathology*, 2, 252-270. doi:10.5127/jep.013611

Materials on Open Science

<https://www.apa.org/science/about/psa/2019/02/open-science>

Appelbaum, M., Cooper, H., Kline, R. B., Mayo-Wilson, E., Nezu, A. M., & Rao, S. M. (2018). Journal article reporting standards for quantitative research in psychology: The APA Publications and Communications Board task force report. *American Psychologist*, 73, 3–25. doi: 10.1037/amp0000191

Baranski, E. (2015, January 22). It's all happening: The future of crowdsourcing science. *Open Science Collaboration*. Retrieved from <http://osc.centerforopenscience.org/2015/01/22/crowdsourcing-science/>

Frankenhuis, W. E., & Nettle, D. (2018). Open science is liberating and can foster creativity. *Perspectives on Psychological Science*, *13*, 439-447. <https://doi.org/10.1177/1745691618767878>

Kruschke, J. K. (2010). An open letter to editors of journals, chairs of departments, directors of funding programs, directors of graduate training, reviewers of grants and manuscripts, researchers, teachers, and students. Retrieved from <http://www.indiana.edu/~kruschke/AnOpenLetter.htm>

Lindsay, S. (2017, October 16). Nineteen things editors of experimental psychology journals can do to increase the replicability of the research they publish. Retrieved from <http://web.uvic.ca/~dslind/?q=node/209>

Lindsay, D. S., Simons, D. S., & Lilienfeld, S. O. (2016, December). [Research preregistration 101](#). *Observer*, *30*

Nosek, B. A., & Lindsay, D. S. (2018, February 18). Preregistration becoming the norm for psychological science. Association for Psychological Science. Retrieved from <https://www.psychologicalscience.org/observer/preregistration-becoming-the-norm-in-psychological-science>

Nosek, B. A., Spies, J. R., Cohn, M., Bartmess, E., Lakens, D., Holman, D., ... Giner-Sorolla, R. (2015, June 12). *Open Science Collaboration*. Retrieved from osf.io/vmrgu

Open Science Collaboration. (2015). Open science framework. Retrieved from <https://osf.io/vmrgu/wiki/home/>

Simons, D., Shoda, Y., & Lindsay, D. S. (2017). [Constraints on Generality \(COG\): A proposed addition to all empirical papers](#). *Perspectives on Psychological Science*, *12*, 1123-1128