

PSYC 51A – STATISTICS
Summer 2018
Department of Psychology, Brandeis University

Instructor:

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Office Hours: the hour following class

Class Meetings: M, T, Th 8:30am-10:50am

Course Website: <http://latte.brandeis.edu/>

Course Description:

This course serves as an introduction to descriptive and inferential statistics. Statistics is used to find meaning in observations by collecting, summarizing, analyzing, and interpreting numerical information about subjects of interest, and it is used to make decisions that go beyond the observation. Since this is a psychology course, techniques useful in the behavioral sciences will be emphasized. Students will learn the theory of statistical decisions, practical application of statistical software (SPSS), how to translate analyzed statistics into convincing written arguments, and how to evaluate presented statistics.

In more detail, topics of the course include methods for describing data, normal, t-, χ^2 -, and F-distributions, hypothesis testing, simple correlation and regression analysis, and analysis of variance (ANOVA). Data and examples from empirical studies will be used to elaborate on when an analytic method is appropriate and how the method can help address the research questions or test the research hypotheses. Students will have ample opportunities to practice using each method through take-home assignments, in-class exercises, examinations, and SPSS reports. Students will receive extensive instruction in the use of SPSS.

Learning Goals:

- To translate observations and questions about the world into statistical statements and questions
- To understand why and when you need statistics
- To describe the world in numerical terms and to organize the data into useful summaries
- To understand the key concepts of hypothesis testing and inferential statistics
- To understand the principles related to each of the statistical method covered in this course.
- To know how to select and to perform the appropriate statistical procedure for your data
- To know how to set up and do the related data analysis in SPSS
- To know how to read and interpret the output in SPSS, communicate the results, and discuss statistical conclusions

Textbook:

- Gravetter, F.J., & Wallnau, L.B. (2015). *Statistics for the Behavioral Sciences* (10th Ed.). Belmont, CA: Wadsworth
- (Optional) Field, A. (2013) *Discovering Statistics using IBM SPSS Statistics* (4th edition). SAGE Publications Ltd.
- Calculator

Course Requirements:

Class attendance and participation (10%)

Every class will begin with a short Quiz covering the material from the previous class. These Quizzes will not be graded and should be used as study-guides. In addition, we will be doing several in-class activities to practice the material learned during the lecture. Again, these activities will not be graded and should be used as study-guides.

Since we will be doing a lot of work in class that cannot be made up, class attendance is required. However, because unforeseen emergencies can prevent your attendance at a class through no fault of your own, two absences during the course are allowed with no reduction in your grade.

Chapter homework (15%)

For every class, there will be an assignment posted on LATTE to be submitted by *the beginning of the class*. The assignments will be based on textbook chapters, so read the chapter before class. The grade range per assignment is 0 - 2, where 0 means you did not submit it, 1 means you made an effort but misunderstood enough material that you should get help, and 2 means you did perfectly or made minor mistakes. Because answers will be available immediately in class or right after class, these assignments will NOT be accepted LATE. You will be allowed to miss two homework assignments during the course. All chapter readings and homework assignments and their tentative due dates are posted on LATTE as well as in the Class Schedule below.

SPSS data analysis reports (40%)

These reports are designed to give you a chance to practice performing statistical analyses using SPSS and writing up a brief report/description of the data. There will be a total of five assignments. Instructions for using the SPSS software will be given in class, and you will submit the related SPSS reports through an assignment posted on LATTE by the beginning of the class indicated in the class schedule below. *Your submitted description/report must reflect your own thoughts, in your own words. Answers that duplicate those of other students will be given 0 credit.* Late data analysis assignments will be accepted with a grade penalty of 2 points per day. (Late assignments have to be sent to me directly and cannot be submitted through LATTE).

Exams (35%)

There are two exams scheduled, and you can find the dates on the class schedule. Both exams will consist of multiple-choice questions followed by short answer questions. A practice exam will be posted prior to the first exam. Exams will be cumulative, based on the nature of statistics, in which new topics incorporate theory and applied aspects of prior learning. More details will be given in class closer to the day of each exam.

Grading:

Your course grade will consist of 1) class participation (10%), 2) chapter assignments (15%), 3) SPSS data analysis reports (40%), and 4) two exams (15% and 20%). For each component, you will receive a numerical score. The final score will be computed using the weights outlined above and converted to a letter grade at the end of the course, based on this standard (i.e., A ≥ 94 , A- ≥ 90 ; B+ ≥ 85 , B ≥ 80 , B- ≥ 75 , C+ ≥ 70 , C ≥ 65 , C- ≥ 60). Individual scores will be posted on LATTE so you can track your own progress.

How to do well in this class:

- *Class participation.* Do not miss any class. If you must miss class and you have any difficulties studying alone, contact me and visit my office hours (or schedule a meeting) and I will give you a short lecture.
- *PowerPoint lecture slides.* Preview the PowerPoint lecture slides and come to class ready to ask questions about assigned reading and lecture slides before each class. Anything

mentioned during lecture can be on the exam, whereas contents that are in the book but not in lecture will not be covered on exams.

- *Homework.* Primarily meant to 1) get you to prepare for class, 2) provide grade protection but NOT meant to prepare you fully for exams, since the grading system is generous (see grade protection / incentive) and does not necessarily cover everything that will be on the exams. Download the answer keys provided for each homework assignment as soon as they are posted on LATTE and go over them to make sure you understand everything. We will go over answers if we have extra time after learning course materials.
- *SPSS assignments.* The SPSS procedures for every assignment will be explained in class. In the syllabus, the SPSS class demonstrations are italicized. If you must miss one of these classes you will have to work with me in office hours to catch up. Start doing the SPSS procedures early, so you can ask questions in class or in office hours before you have to write your report. The report format will be provided in LATTE. Note that the exams will contain SPSS materials as well.
- *Exams.* A practice exam with answers will be provided in LATTE. The practice exam content is a representative sample of what the real exam will cover, but it may not cover every topic that will be on the real exam. The practice exam will be about 1/2 the length of the real exams. A good strategy is to study the lecture slides, the book, your notes, the assignments, and do the practice exam. (In-class work sheets are for students who want extra practice.)
- *Note from University:* Success in this 4 credit hour course is based on the expectation that students will spend a minimum of 9 hours of study per week in preparation for class.

Class Policies:

- **Makeup exams** - In emergency cases, only with valid excuses, you may take a makeup exam prior to the scheduled exam day. Valid excuses consist of sickness with a doctor's note and documented family emergencies.
- **Disability Services** - If you are a student with a documented disability on record at Brandeis University and wish to have reasonable accommodations made for you, please let me know.
- **Academic Honesty** - Academic integrity is central to the mission of educational excellence at Brandeis University. Each student is expected to turn in work completed independently, except when assignments specifically authorize collaborative effort. It is not acceptable to use the words or ideas of another person – be it a world-class philosopher or your lab partner – without proper acknowledgement of that source. This means that you must use author citations, endnotes, and, where appropriate, quotation marks to indicate the source of any phrases, sentences, paragraphs, or ideas found in published volumes, on the internet, or created by another student. Violations of University policies on academic integrity, described in Section Three of Rights and Responsibilities, may result in failure in the course or on the assignment, or in suspension or dismissal from the University. If you are in doubt about the instructions for any assignment in this course, it is your responsibility to ask for clarification.
- **Etiquette** - Please arrive on time to settle down before class begins and remain until the end, and deactivate your cell phone to show respect for others. Do not engage in activities that will distract our learning.

Student resources:

- Textbook comparison site for students: <http://www.addall.com>
- For SPSS support at Brandeis, refer to <https://kb.brandeis.edu/display/LTS/SPSS+Support>
- For SPSS tutorials and other good stuff see www.youtube.com/user/ProfAndyField
- Good site for revisiting basic math: <http://www.bbc.co.uk/schools/gcsebitesize/maths/>

Electronic Resources:

SPSS statistical software package, Version 24: Accessible on computers in Goldfarb Computer Classroom (26 seats, Goldfarb Library Mezzanine), Farber Computer Classroom (32 seats, Farber Library Level 1), Information Commons (27 seats, Goldfarb Library Level 1), Shapiro Library Cluster (24 seats, Shapiro Campus Center Level 2). SPSS can also be installed on your personal PC or Mac. *If necessary, you can go to the Help Desk for help with installation.

Comments:

The material based on inferential statistics and performing analysis using SPSS are demanding at first and you may probably have to go over it several times in several different ways before you fully understand it. However, students who do complete all of this work are likely to master the necessary skills and make good grades. You may also find that conducting the analysis is interesting and rewarding. Your comments and suggestions about this course are welcome at any time. Also, if you experience any difficulties, do not hesitate to contact me early on. We've all needed help in something at some point in our lives. If you find yourself not understanding the assigned readings, lectures, or assignments, please set up an appointment with me or drop by during office hours. Please remember that doing all requirements thoroughly is the key to successfully mastering this course!

CLASS SCHEDULE*

Including approximate due dates for readings, homework assignments, SPSS reports

*Please note that the class schedule below is tentative / subject to change. Dictated by the needs of the class, it may be necessary to make changes to the timing of the content as the course progresses.

Class Meetings	Topic / Reading (G & W Chapter) (Reading done before class)	HW Due	SPSS Reports Due
1	Introduction, Behavioral Research IPT data collection, SPSS basics, <i>Data entry</i>		
2	Populations, samples, & scales (Ch 1) Frequency (Ch 2) & Central tendency (Ch 3)	Ch 1-3	
3	Variability (Ch 4) Percentile practice & Z scores (Ch 5)	Ch 4+5	
4	Normal distribution (Ch 6) <i>SPSS Demo #1 (descriptive)</i>	Ch 6	
5	Probability & Sampling (Ch 7)	Ch 7	SPSS report #1
6	Hypothesis Testing, Effect size & Power (Ch 8)	Ch 8	
7	<i>SPSS Demo #2 (z-test)</i> Review 1		
8	EXAM 1		
9	Intro to T-test (Ch 9) Independent T-test (Ch 10)	Ch 9+10	SPSS report #2
10	Related samples T-test (Ch 11) <i>SPSS Demo #3 (t-test)</i>	Ch 11	
11	Intro to ANOVA Between subject ANOVA (Ch 12)	Ch 12	SPSS report #3
12	Within subject ANOVA (Ch 13) <i>SPSS Demo #4 (ANOVA)</i>	Ch 13	
13	Two-factor ANOVA (Ch 14) Interaction (Ch 14)	Ch 14	SPSS report #4
14	Correlation (Ch 15) Regression (Ch 16)	Ch 15+16	
15	Chi-square (Ch 17) <i>SPSS Demo #5 (correlation, regression)</i>	Ch 17	
	EXAM 2		SPSS report #5