

Course Syllabus: Psychology 5113
Psychological Statistics
Spring, 2021

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REQUIRED TEXTS

Diekhoff, G. M. (1992 McGraw-Hill reprint). *Statistics for the Social and Behavioral Sciences: Univariate, Bivariate, and Multivariate*. New York: McGraw-Hill (formerly Wm. C. Brown Publishers). Purchase from Psychology Department office. This text was written in 1992 specifically for students taking a single graduate statistics course. It provides a conceptual review of elementary statistics and an introduction to advanced multivariate techniques but, by intention, does not delve into details such as statistical assumptions.

Meyers, L. S., Gamst, G., and Guarino, A. J. (2017). *Applied multivariate research: Design and interpretation*. Los Angeles: Sage. This text provides the depth and detail that was intentionally left out of the Diekhoff (1992) text. It focuses on multivariate techniques and I think that you will find the coverage of SPSS mechanics particularly useful.

RECOMMENDED TEXTS

Warner, R. (2008 or 2013). *Applied Statistics: From Bivariate Through Multivariate Techniques* (1st or 2nd ed.). Los Angeles: Sage.

Tabachnick, B. G. & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Upper Saddle River, NJ: Pearson.

ADDITIONAL RECOMMENDATIONS

The computer lab in O'Donahoe 106 will be available to you throughout the semester, but I think you'll find it convenient to have a personal subscription to SPSS (Version 27) on your own laptop or desktop computer. Here is a vendor who has been reliable and provided good customer service in the past:

<https://www.hearne.software/SPSS-Selection>. The cost is about \$50

for a six-month subscription.

Laerd Statistics at <https://statistics.laerd.com> provides an excellent guide to the use of SPSS at a very reasonable price--\$12.99 for six months). I recommend that you take the free tour and decide if their guide might be helpful to you as you learn to use SPSS.

PURPOSES AND GOALS OF THE COURSE

We will spend the first half of the semester reviewing the basic concepts of univariate and bivariate statistics, filling in some of the details that were probably missing from your undergraduate statistics class. During the second half of the semester we will cover topics in bivariate and multivariate statistics that were certainly not covered in your undergraduate course. In addition to acquiring a conceptual understanding of these statistical procedures, you will develop the ability to evaluate research scenarios in order to isolate the research questions being asked and determine which statistical techniques are most appropriate to answering those questions. You will become skilled in the use of statistics through regular homework and in-class assignments that require both manual calculation and computerized data analysis. Your training will include a thorough introduction to the use of IBM SPSS 27.0 for Windows and most class sessions will include at least some time spent in the computer lab working with IBM SPSS. The ultimate goal of this course is to train you to be intelligent and critical consumers of the technical and professional research literature in the social and behavioral sciences and to be capable users of applied statistics.

The course is fast-paced, and must be in order to cover the breadth of statistics. This will require concerted effort on your part. Although most reading assignments are relatively brief, chapters in your text are information-rich and extracting that information will require that you study it, work with it, and *experiment* with it. Don't be frustrated by the fact that you will be unable to grasp everything.

GRADING

Course grades will be determined by your average on the four exams. These exams will cover definitional and conceptual knowledge as well as your ability to analyze research problems, select appropriate statistical procedures, and use statistics effectively to answer research questions.

The grading scale will be as follows:

85-100% A
50-84% B
Lower than 50% C

DISABILITIES

Individuals requiring special accommodations according to the Americans with Disabilities Act should work with the MSU Disabilities Office and request that they notify me directly.

LECTURES: WHAT YOU CAN EXPECT

This is a synchronous online course. What that means is that I will use the Zoom platform to stream lectures online from a remote location on a fixed schedule: Mondays and Wednesdays from 11:30 am to 12:50 pm from January 11, 2021 through April 21, 2021. You will be able to access those lectures through MSU's D2L platform. The lectures will not be recorded. If you wish to record lectures you will need to acquire personal software to accomplish that purpose. You should contact D2Lhelp@msutexas.edu if you have any difficulties or questions pertaining to accessing lectures via D2L.

Four tests covering material presented in lectures and the textbook will all be administered remotely through D2L. In order to provide me with some flexibility in the pacing of lectures, these four exams are not scheduled in advance. Instead, the date of each lecture exam will be announced in lecture at least one week in advance.

COMMUNICATION: WHAT YOU CAN EXPECT

Although D2L will serve as the platform to provide all lectures and tests in the course, all other communication with me will be via email, not the D2L messaging or announcement systems. My email address is george.diekhoff@msutexas.edu and I will use the email addresses you have on file with MSU to communicate with you. If you do not receive an email from me that you expected to receive, check the spam folder of your email software.

TOPICS AND ASSIGNED READINGS

Introduction, Scales of Measurement

Diekhoff Chapter 1

Meyers et al. Chapters 1, 2, 3

Descriptive Procedures

Data Distributions and Graphs

Diekhoff Chapter 2

Descriptive Statistics

Diekhoff Chapter 3

Standard Scores, Standard Normal Distribution

Diekhoff Chapter 4

Interval Estimation

Diekhoff Chapter 5

EXAM 1

Univariate Significant Difference Tests

One-Sample Tests

Diekhoff Chapter 6

Two-Sample Tests

Diekhoff Chapter 7

One-Way ANOVA

Diekhoff Chapter 8

Meyers et al. Chapter 18

Factorial ANOVA

Diekhoff Chapter 9

EXAM 2

Bivariate Correlation and Regression

Bivariate Correlation

Diekhoff Chapter 10

Meyers et al. Chapter 4

Bivariate Regression

Diekhoff Chapter 11

Multivariate Correlation and Regression

Partial and Semi-Partial Correlation

Diekhoff Chapter 12

Meyers et al. Chapter 5

Multiple Correlation and Regression

Diekhoff Chapter 13

Meyers et al. Chapters 5, 6

EXAM 3

Multivariate Significant Difference Tests

Discriminant Analysis (One-Way MANOVA)

Diekhoff Chapter 14

Meyers et al. Chapters 18, 19

Factorial MANOVA

Diekhoff Chapter 15

Examining Data Structures

Factor Analysis

Diekhoff Chapter 16

Meyers et al. Chapter 10

Cluster Analysis

Diekhoff Chapter 17

Meyers et al. Chapter 17

Multidimensional Scaling

Diekhoff Chapter 18

Meyers et al. Chapter 16

EXAM 4