

Course Syllabus
Psychology 5113
Psychological Statistics
Spring, 2022

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REQUIRED TEXTS

Diekhoff, G. M. (1992). *Statistics for the Social and Behavioral Sciences: Univariate, Bivariate, and Multivariate*. New York: McGraw-Hill (formerly Wm. C. Brown Publishers). (You'll be provided with a free PDF copy.)

Diekhoff, G. M. (revised 2021). *Guide to SPSS for Graduate Statistics*. (You'll be provided with a free editable copy.)

Warner, R. M. (2021). *Applied Statistics I: Basic Bivariate Techniques* (3rd ed.). Thousand Oaks, CA: Sage. ISBN: 978-1-5063-5280-0

Warner, R. M. (2021). *Applied Statistics II: Multivariable and Multivariate Techniques* (3rd ed.). Thousand Oaks, CA: Sage. ISBN: 978-1-5443-9872-3

(You may prefer to instead use the less expensive R. M. Warner's 2nd edition: *Applied Statistics: From Bivariate Through Multivariate Techniques*. Thousand Oaks, CA: Sage. ISBN: 978-1-4129-9134-6. This edition combines the two volumes of the 3rd edition into a single textbook.)

ALSO RECOMMENDED FOR A MORE COMPLETE STATISTICS LIBRARY

Meyers, L. S., Gamst, G., & Guarino, A. J. (2013 or 2017). *Applied Multivariate Research: Design and Interpretation* (2nd or 3rd eds.). Thousand Oaks, CA: Sage.

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

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 28.0 for Windows and most class sessions will include at least some time spent in the computer lab working with 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 textbooks, especially the Warner texts, 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.

EXPECTATIONS

Please attend class regularly.

Please get to class early, not late.

Complete homework assignments in a timely manner

Be patient with those who learn more slowly than you do.

Be patient with those who learn more quickly than you.

Be courteous.

GRADING

Course grades will be determined by your average on the four exams:

85-100% A
70-84% B
50-69% C
30-50% D
Lower F

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. You'll need to be able to complete statistical analyses both manually and using IBM SPSS. Borderline grades will be affected by factors such as attendance, timely completion of homework assignments, and quality (not quantity) of participation.

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.

TOPICS AND ASSIGNED READINGS

Introduction, Scales of measurement

Diekhoff Chapter 1
Warner I: Chapters 1, 2
Warner II: Chapter 2

Descriptive Procedures

Data Distributions and Graphs
Diekhoff Chapter 2
Warner I: Chapter 3, 5

Descriptive Statistics

Diekhoff Chapter 3
Warner I: Chapter 4

Standard Scores, Standard Normal Distribution
Diekhoff Chapter 4
Warner I: Chapter 6

Interval Estimation
Diekhoff Chapter 5
Warner I: Chapter 7

EXAM 1*

Univariate Significant Difference Tests

One-Sample Tests
Diekhoff Chapter 6
Warner I: Chapters 8, 9

Two-Sample Tests
Diekhoff Chapter 7
Warner I: Chapters 12, 14

One-Way ANOVA
Diekhoff Chapter 8
Warner I: Chapter 13

Factorial ANOVA
Diekhoff Chapter 9
Warner I: Chapter 16

EXAM 2*

Bivariate Correlation and Regression

Bivariate Correlation
Diekhoff Chapter 10
Warner I: Chapters 10, 17

Bivariate Regression
Diekhoff Chapter 11
Warner II: Chapter 4

Multivariate Correlation and Regression
Partial and Semi-Partial Correlation
Diekhoff Chapter 12
Warner II: Chapter 3, 8

Multiple Correlation and Regression
Diekhoff Chapter 13
Warner II: Chapters 5, 6

EXAM 3*

Multivariate Significant Difference Tests
Discriminant Analysis (One-Way MANOVA)
Diekhoff Chapter 14
Warner II: Chapters 10, 11

Factorial MANOVA
Diekhoff Chapter 15
Warner II: Chapter 11

Examining Data Structures
Factor Analysis
Diekhoff Chapter 16
Warner II: Chapter 12

Cluster Analysis
Diekhoff Chapter 17
Meyers II: Chapter 17.4

Multidimensional Scaling
Diekhoff Chapter 18

EXAM 4*

* Dates of exams will be announced in class at least one week in advance.