

Instructor

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Office Hours

Monday 3:00-4:30pm, or by
appointment

Teaching Assistant

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Office Hours

Tuesday & Thursday 1:00-5:00pm or
by appointment

Required Textbook

- Hinkle, D.E., Wiersma, W., & Jurs, S.G. (2003). *Applied Statistics for the Behavioral Sciences, Fifth Edition*. Boston, MA: Houghton Mifflin.
- Maybe some supplemental readings placed on reserve in the Benjamin Building Circulation Desk (basement).

Additional Reference Textbooks

- Agresti, A., & Finlay, B. (1997). *Statistical Methods for the Social Sciences* (3rd ed.) Upper Saddle River, NJ: Prentice Hall. (Novice to intermediate)
- Howell, D.C. (2002). *Statistical Methods for Psychology* (5th edition). Pacific Grove, CA: Duxbury Press. (Intermediate)
- Glass, G.V. & Hopkins, K.D. (1984). *Statistical methods in education and psychology* (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall. (Moderately advanced)
- Hays, W. (1999). *Statistics* (5th ed.). New York: Hot, Rinehart, & Winston. (Advanced)
- Neter, J., Kutner, M.H., Nachtsheim, C.J., & Wasserman, W. (2004). *Applied linear statistical models* (5th ed.). Chicago: Irwin. (Advanced)

Blackboard and Course Delivery

I will be using “Blackboard,” the University of Maryland’s new course delivery system. For those of you who have used WebCT in the past, the transition to blackboard should be seamless. To access the course, please use the following URL...

<https://elms.umd.edu/webapps/portal/frameset.jsp>



You will be directed to the Blackboard homepage where you will be asked to provide your *Username* (Directory ID) and a *Password*. If you have difficulty logging in there is a self-help page that takes you step-by-step through the process located by clicking on “Student: Logging into your Course(s)” housed within the Login help box on the homepage.

What you will find on the course site...

- Folders for assignments, course notes, data sets, exam materials, etc.
- Grades
- Announcements and other types of communication

Prior to coming to class each week, students are to print out and bring with them the lecture notes for that week’s class. Please follow the syllabus for topics and dates. Materials should be posted by the morning on the day of class. If they are not, please don’t fret. I will make copies of the notes and bring them to class for you.

Course Description

EDMS 645 is the first course of a two-semester graduate level statistics sequence in the Department of Measurement, Statistics & Evaluation at the University of Maryland. The course introduces you to elemental methods of data description and inferential statistical analyses (see the topic list below). The class is applied, meaning that course material will be presented to facilitate your conceptual understanding of fundamental statistical methods typically employed in educational and psychological research settings. This does not mean that underlying statistical and mathematical theory will not be presented; it just won’t be the focal point of the course. Technical aspects of analyses will be presented and stressed as the material warrants. It is assumed that the student has at least a working knowledge of high school algebra.

Statistical Software

While there are numerous statistical packages available to researchers today, the EDMS department supports SPSS versions 11.0 and higher (Windows and Macintosh). Examples in class will come from SPSS/Windows (14.0), which is available in the Benjamin Building’s computer lab (0230) in the basement. Students may use whichever recent package they wish, but they should know that slight differences may exist between what I present and the options available on their chosen version. There are three possible courses of action for using SPSS...

- Option 1: Buy nothing. Use a campus lab to do SPSS for this class.
- Option 2: Buy a version of the Student/Ware package, which include a manual and should get you through EDMS 651.



- Option 3: Buy a version of the Grad Pack, which historically costs about \$225 and manuals must be purchased separately. This is for the student who plans to take more quantitative classes beyond EDMS 651, and/or who plans to conduct serious quantitative research (e.g., a dissertation).

Course Topics and Readings

Below is a list of topics and readings we will cover throughout the semester. I do not provide a detailed calendar, as I am not sure how long topics will take to cover in class. However, for the most part, we will follow the order of listed topics. Students should keep up with the readings whether or not the material is explicitly covered in class or not.

Topics	Readings
<i>Research Methods</i>	Hinkle – Ch. 1
<i>Descriptive Statistics</i>	Hinkle – Ch. 2 & 3
<i>Normal Distribution</i>	Hinkle – Ch. 4
<i>Sampling, Probability and Sampling Distributions</i>	Hinkle – Ch. 7
<i>Hypothesis Testing (Conceptual)</i> <i>Type I and Type II Error</i> <i>Power</i>	Hinkle – Ch. 8 & 13
<i>Test of the Mean</i> <i>One-sample t-test</i> <i>Two-sample independent groups</i> <i>Two-sample dependent groups</i>	Hinkle – Ch. 10, 11 & 12
<i>Correlation</i>	Hinkle – Ch. 5
<i>Simple Linear Regression</i>	Hinkle – Ch. 6
<i>Chi-square tests for nominal data</i>	Hinkle – Ch. 21

Course Objectives

By the end of the course the student should have demonstrated the ability to:

1. identify applications of descriptive statistics.
2. perform elementary operations in algebra.
 - when given expressions in summation notation, write them in expanded form following the laws of algebra;
 - when given formulas in expanded summation notation, write them in compact form;



- when given an expression not in summation notation, write it in such notation.
- 3. identify differences between the four kinds of variables.
- 4. differentiate between samples and populations and between parameters and random variables, and know when each is used.
- 5. identify different kinds of graphs (histograms, stem-and-leaf diagrams, boxplots, etc.) and know proper uses (and misuses) of each kind of graph.
- 6. properly construct each kind of graph when given a set of data.
- 7. interpret graphic and tabular representations of data, recognizing important differences among them.
- 8. recognize and identify differences between various descriptive statistics, such as the mean, median, trimmed mean, midmean, interquartile range, variance, standard deviation, skewness, and kurtosis.
- 9. recognize formulas for the above statistics (as well as others), and be able to write them in summation notation.
- 10. compute the above statistics.
- 11. compute the descriptive statistics for linear transformations and combinations of variables, and describe the influence of the transformations on the statistics.
- 12. describe distributions of different types in terms of shape, location and variability, and match the values of descriptive statistics to corresponding graphic representations of data.
- 13. calculate the Pearson r , r^2 , r_{pb}^2 (squared) correlations, ϕ^2 and know when they are most appropriately applied.
- 14. construct a prediction model using simple linear regression and interpret the resulting values.
- 15. compute and interpret measures of explained variation.
- 16. recognize differences in the properties of normal and nonnormal distributions, and identify the consequences of the central limit theorem.
- 17. know the definition and properties of sampling distributions including Type I and Type II errors.
- 18. perform a test of statistical significance to assess the relationship between two qualitative variables and interpret the results.
- 19. use the sampling distribution of the sample mean to compute a test statistic and an interval estimate for the population mean.
- 20. use the sampling distribution of the difference between two sample means to compute a test statistic and interval estimate for the population mean difference (independent groups).
- 21. use the sampling distribution of the difference between two sample means to compute a test statistic and interval estimate for the population mean difference (dependent groups).
- 22. know the definition of power and factors affecting it, and how to perform power/sample size calculations.
- 23. perform a test of goodness-of-fit, interpret results in terms of the hypothesis being tested
- 24. perform a test of independence (“homogeneity”), interpret the results in terms of the hypothesis being tested



Formal Course Assessment

Homework Assignments

There will be several assignments spaced evenly throughout the summer, each designed to give students an opportunity to apply and practice concepts learned in class. It is expected that students will be using SPSS for their homework where computer work is required. In working the assignments, you are expected to pull together the material from lecture, the text, and the supplemental notes where applicable. Late homework assignments **will not** be accepted. Also, homework **cannot** be submitted via email. Graded assignments will generally be returned the following day in class after they are submitted. **Students are encouraged to work in groups on homework and to turn in a single homework with the names of the group members (maximum of 3 students per group). It should be understood that all members of a group receive the same score on homework completed together.** You may wish to keep a photocopy or at the very least save assignments electronically for your own protection. Assignments are due upon entering the class on the specified due date.

In the assignments students should cut and paste relevant portions of the computer output into the appropriate places in your homework to show how you arrived at your solution. Students **should not** write, “See p.86 of the attached computer printout to see where I got my answer.” Assignments should be well-organized and free from spelling, grammatical, and punctuation errors. Finally, all assignments **must be** word-processed. You will need to use Microsoft equation editor or similar software to incorporate any mathematical notation and symbols into your documents. This package is located in Microsoft Word and can be accessed within the document: INSERT → OBJECT → Microsoft Equation 3.0.

Quizzes

There will be several short quizzes given on Mondays throughout the summer. These quizzes will be administered toward the end of the class period. Each quiz will cover material from the lessons since the last quiz (unless otherwise specified) and should not take more than 15 to 20 minutes. Quizzes will be composed of free response and/or multiple-choice questions. All quizzes will be closed book and closed note, however, you may bring and use any hand-held calculator. All quizzes will count (i.e., none will be dropped).

Exams

There will be an in-class midterm exam (date to be determined). The content of the exam will cover topics presented in class up to that point. The exam will be closed book and closed class note; however, students may prepare and use two 8.5”x11” two-sided pages of notes. Students should bring a calculator to the exams; and note the sharing of calculators between students will not be allowed.



Course Grades

This course is not graded on a curve. Your homework, quizzes and exam will be combined using a weighted average grading scheme with the corresponding weights given below. Final letter grades will then be assigned based on the given scale (there will be no rounding).

Assessment	Weight	Overall Course Percent	Grade
Total homework points	60%	100% - 93.000%	A
Total midterm exam points	25%	92.999% - 88.000%	A-
Total quiz points	15%	87.999% - 85.000%	B+
		84.999% - 81.000%	B
		80.999% - 78.000%	B-
		77.999% - 75.000%	C+
		74.999% - 70.000%	C
		69.999% - 66.000%	C-
		59.999% - 58.000%	D+
		57.999% - 55.000%	D
		54.999% - 50.000%	D-
		≤ 49.999%	F

No Extra Credit

Your course grade will be based only on the above assessments. There will be **no** extra credit opportunities. Please do not ask for exceptions.

Incompletes

Incompletes for this course will be given on a case-by-case basis. The most valid reason for an incomplete is an unforeseen event that gravely interferes with a student's ability to perform at an adequate level. Incompletes will not be given for unqualified poor performance.

Accommodations for Emergencies

In the event that the University closes on the day of class (for instance, a huge hurricane rips through the campus), we will obviously have no class. However, if the University does not shut down and there is a threat of inclement weather, etc., we will still have class unless you hear from me otherwise. With that said, please check your email and/or the course website on blackboard, sometime during the day of class for any last minute postings of announcements regarding the course. If you need to be gone from class, out of common courtesy I would appreciate if you would send me an email to let me know. All students are expected to take the exams and/or submit assignments on the specified dates and no make-up exams



are planned (see section on make-up exams below). You must contact me before an exam if you are going to be absent or you will receive a zero for that assessment.

Academic Accommodations

In compliance with and in the spirit of the Americans with Disabilities Act (ADA), I want to work with you if you have a documented disability that is relevant to successfully completing your work in this course. If you need academic accommodation by virtue of a **documented disability**, please contact me as soon as possible to discuss your needs. Students with documented needs for such accommodations must meet the same achievement standards required of all other students, although the exact way in which achievement is demonstrated may be altered. All requests for academic accommodations should be made as early as possible in the semester. For further information concerning disability accommodations, please contact Dr. William Scales at the Disability Support Service – (301) 314-7682.

Academic Integrity

The University of Maryland, College Park, has a nationally recognized “Code of Academic Integrity,” administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible to uphold these standards for this course. It is imperative that you are aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the code of Academic Integrity or the Student Honor Council, please visit → <http://www.studenthonorcouncil.umd.edu/code.html> for details.

On plagiarism -- It is important that the student synthesize pertinent information from the readings and class lectures when writing up homework assignments. Synthesis does not occur when large blocks of text are copied from the textbook or my notes and used to answer questions. It is understood that the student will have to use some verbatim phrases and definitions from the textbook or notes. This is not considered a case of scholastic misconduct. What must be avoided is extensive verbatim copying of information from the textbook or my notes when answering the longer questions on the assignments.

Make-Up Examinations

The University policy states: “An instructor is not under obligation to offer a substitute assignment or to give a student a make-up assessment unless the failure to perform was due to an excused absence, that is, due to illness (of the student or a dependent), religious observance (where the nature of the observance prevents the student from being present during the class period), participation in university activities at the request of university authorities, or compelling circumstances beyond the student’s control. Students claiming excused absence must apply in writing and furnish documentary support for their assertion that absence resulted from one of these causes.”

