

COURSE SYLLABUS

Department:	Educational Studies College of Education
Course Title:	EMR 645: Elementary Statistics
Credit Hours:	3
Clock Hours:	Thursdays 6:00 pm - 9:00 pm, first class August 28th
Location:	WMU Kalamazoo Campus, Sangren Hall, Room 2202 (computer lab)
Course Web Site:	http://homepages.wmich.edu/~wlacefie
Course Description:	<p>EMR 645 is a graduate level course covering the principles of research design and data analysis at both the conceptual and applied levels. This course introduces basic measurement and scaling considerations applicable in behavioral research; descriptive statistics (central tendency, variability, tables, and graphics); hypothesis testing, (estimation, power, confidence intervals, rates and proportions, chi-square and t-test); and bivariate correlation with an introduction to linear regression.</p> <p>All topics will be taught from an applied perspective that will include statistical computing using SAS or SPSS in a PC environment with an emphasis on interpretation and write-up of statistical output.</p>
Prerequisite:	Admission into a doctoral program. Successful completion of EMR 640: Introduction to Research or equivalent is recommended.
Professor:	Warren Lacefield, Ph.D. Educational Studies 3502A Sangren Hall, Kalamazoo Campus 269-387-5945 voice 269-387-5703 fax
Office Hours:	Wednesday 1:00 pm – 3:00 pm Thursday 1:00 pm – 3:00 pm and by appointment warren.lacefield@wmich.edu

Course Objectives: The student will be able to:

1. Differentiate, utilize, and apply statistical description and inference to basic, applied, and clinical research in psychology, applied research in education, and the broader arena of the behavioral sciences
2. Differentiate between statistical description and statistical inference in reference to the generalizability of statistical findings vis-a-vis research goals (summary, measurement and estimation, hypotheses testing, evaluation).
3. Understand and be able to utilize various forms of charts and graphs useful for statistical description.
4. Understand the concept and utility of statistical error and statistical sampling distributions.
5. Create a data set suitable for data analysis by either SAS or SPSS.
6. Write, debug, and interpret SAS and/or SPSS programs and associated output.
7. Use a statistical program (either SAS or SPSS) for data analysis.
8. Select statistical analyzes appropriate to the type of data being analyzed and the question being asked.
9. Distinguish Type I and Type II errors in statistical hypothesis testing.
10. Interpret the concepts of statistical power and the influence of sample size on statistical inference.
11. Conduct a statistical power analysis.
12. Correctly interpret statistical output so that it can be written-up (APA style) and understood by a non-statistician.

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Teaching Methods: Lecture and demonstration with computer laboratory time

Required Texts:

Glass, G.V. & Hopkins, K.D. (1996). Statistical methods in education and psychology (3rd ed.). Boston: Allyn and Bacon, Inc.

Supplemental Texts:

APA Publication Manual (5th ed).

Cody, R.P. & Smith, J.K. (1997). Applied statistics and the SAS programming language (4th ed.). New York: North-Holland.

Morgan, S.E., Reichert, T. & Harrison, T.R. (2002). From numbers to words: Reporting statistical results for the social sciences. Boston: Allyn and Bacon, Inc.

Pavkov, T. & Pierce, K. (2003) Ready, set, go: Student guide to SPSS 11.0 for Windows. New York: McGraw-Hill.

For other good supplemental materials, visit the Support Documentation webpage linked to the course homepage.

Methods of Evaluation: Weekly homework as assigned
Mid-term examination (take-home)
Final examination (take-home)

<u>Grading:</u>	Homework Mid-term Final	30% 30% 40%	<u>Based on total points earned:</u>	
			100 – 95 %	A
			94 – 90 %	BA
			89 – 85 %	B
			80 – 84 %	CB
			79 – 75 %	C
Below 75 %	E			

Homework policy: Homework will be counted but not individually graded. (Homework will be reviewed during the class period following assignments and solutions will be posted at the course website following each class period.) Late homework will NOT be counted. Homework is due **by email in MS Office formats** no later than 6 days after the assignment unless otherwise indicated by the instructor.

Need for Accommodations:

Any student with a documented disability (e.g., physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the professor and the appropriate Disability Services office at the beginning of the semester. The two disability service offices on campus are: Disabled Student Resources and Services 269-387-2116 and the Office of Services for Students with Learning Disabilities 269-387-4411.

Diversity Statement:

The Department of Educational Studies EMR program maintains a strong and sustained commitment to the diverse and unique nature of all learners and high expectations for each student.

Professional Concerns:

You are responsible for making yourself aware of and understanding the policies and procedures in the Undergraduate (pp. 268-270) [Graduate (pp. 24-26)] Catalog that pertain to Academic Integrity. These policies include cheating, fabrication, falsification and forgery, multiple submission, plagiarism, complicity, and computer misuse. If there is reason to believe you have been involved in academic dishonesty, you will be referred to the Office of Student Judicial Affairs. You will be given the opportunity to review the charge(s). If you believe you are not responsible, you will have the opportunity for a hearing. You should consult with me if you are uncertain about an issue of academic honesty prior to the submission of an assignment or test.

COURSE SYLLABUS

Class	Date	Topic
1	Aug 28	Measurement and statistical analysis: description, inference, evaluation. Review of arithmetic, algebra, and sigma notation. <i>Homework #1:</i>
2	Sep 4	Exploratory data analysis: data coding, data entry, data screening. <i>Homework #2:</i>
3	Sep 11	Exploratory data analysis: bar charts, histograms, graphs, distributions. <i>Homework #3:</i>
4	Sep 18	Simple descriptive statistics: central tendency, range, mode, median, mean, variance, standard deviation, standard scores (z-scores). <i>Homework #4:</i>
5	Sep 25	Sampling distributions: standard error of the mean, central limit theorem, skewness, kurtosis, confidence intervals. <i>Homework #5:</i>
6	Oct 2	Statistical inference: estimation & hypothesis testing, Type I & II error. Power analysis <i>Homework #6:</i> <i>MID-TERM EXAM to be handed out, due Oct 16th @ 6:00pm</i>
7	Oct 9	Catch-up and review.
8	Oct 16	T-tests: one sample, two independent samples, paired samples <i>Homework #7:</i>
9	Oct 23	Applied power analysis.
10	Oct 30	Correlation analysis <i>Homework #8:</i>
11	Nov 6	Part and partial correlation.
12	Nov 13	Simple linear regression (1 dependent and 1 independent variable) <i>Homework #9:</i>
13	Nov 20	Introduction to multiple regression (1 dep and 2 indep variables) <i>Homework #10:</i> <i>FINAL EXAM to be handed out, due Dec 11th @ 6:00pm</i>
-	Nov 27	<i>THANKSGIVING BREAK</i>
14	Dec 4	Catch-up and review

Exams can be turned in to the Department of Educational Studies main office on main campus.

Selected Bibliography

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