

COURSE OUTLINE

Fall 2004

<u>Course Number and Title::</u>	EMR645: Elementary Statistics
<u>Hours of Credit</u>	3
<u>Clock Hours:</u>	Tuesdays, 4:30 - 7:30 p.m.
<u>Location:</u>	Roosevelt Middle School 23261 Scotia Oak Park, MI 48237
<u>Prerequisite:</u>	Admission into a doctoral program. Successful completion of EMR640: Introduction to Research or equivalent is recommended.
<u>Instructor:</u>	Dr. Walter L. Burt Assistant Professor 3422 Sangren Hall Western Michigan University Kalamazoo, MI 49008 1.269.387.1821 (o) 1.616.821.5539 (c) 1.616.243.3113 (h)
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<u>Office Hours:</u>	By appointment only

Course Description: EMR645 is a graduate level course covering the principles of research design and data analysis at both the conceptual and applied levels. This course introduces: (a) basic measurement and scaling considerations applicable in behavioral research; (b) descriptive statistics (central tendency, variability, tables and graphs), (c) hypothesis testing (estimation, power, confidence intervals, rates and proportions, chi-square and t-test), and (d) bivariate correlation with an introduction to linear regression. Skills in the use of computer programs for data manipulation and analysis are developed.

All topics will be taught from an applied perspective that will include statistical computing using SPSS in a PC environment. Skills gained from these learning opportunities will be used to develop a draft proposal for the doctoral dissertation.

Course Objectives: As a result of participating in this class, 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, etc.);
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. Use a statistical program (e.g., SPSS) for data analysis;
6. Create data set suitable for data analysis by SPSS;
7. Select statistical analyzes appropriate to the type of data being analyzed and the questions being asked;
8. Distinguish between Type I and Type II errors in statistical hypothesis testing;
9. Interpret the concepts of statistical power and the influence of sample size on statistical inference; and
10. Interpret statistical output so that it can be written-up (APA style) and understood by a non-statistician.

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.

Supplemental Texts:

APA Publication Manual (5th ed.).

Cody, R.P. & Smith, J.K. (1997). Applied statistics and the SAS programming language (4th ed.).

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.

Methods of Evaluation:

1. Class assignments
2. Mid-term examination
3. Final examination
4. Draft dissertation prospectus

Grading:

Assignments		Based on total points earned:	
Class assignments	20%	100 - 95%	A
Mid-term examination	30%	94 – 90%	BA
Final examination	30%	89 – 85%	B
Draft dissertation prospectus	20%	84 – 80%	CB
		79 – 75%	C
		Below 75	E

In the issuance of course grades, students should be aware that the course grade is a measure of the student’s performance for required performance appraisal activities. Regular attendance and participation in class is expected. If a student is absent, s/he is responsible for making up missed work. Students are encouraged to talk to other students about class assignment when absent.

Record of Student Performance:

In accordance with adopted policy statements (see p.13, The graduate bulletin, “Student Academic Rights”), students have the right to all of their examinations and other written, graded materials made available to them with an explanation of the grading criteria. Students can expect to have all such materials retained for at least one full semester after course was given.

COE Diversity Statement:

The College of Education maintains a strong and sustained commitment to the diverse and unique nature of all learners and high expectations for their ability to learn and apply their learning in meaningful ways.

Expectations:

The methods of instructions used in this class are based firmly on the assumption that learning depends on the activity of the student rather than on the instructor; that learning the process is as important as the content, that the overall aim is to develop understandings that will be used in performing the various sections that comprise the leadership process, rather than to provide mere knowledge.

The content of class discussion is considered to be important as well as the student's own use of resources, his/her interaction with the instructor and with other students, and his/her preparation of individual assignments which force him/her to react thoughtfully to what he/she hears, observes or reads.

Preparation for class discussion, participation and the doing of individual assignments are most important. Effective learning depends on extensive use of resources, which must be started early and pursued vigorously.

Attendance in class is considered important, and aside from unusual circumstances, the student is expected to be both present and punctual for each session.

You are responsible for making yourself aware and understanding of the policies and procedures in the Undergraduate (pp.268-271) or Graduate (pp. 26-28) Catalogue that pertains to Student Academic Conduct. 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 Judicial Affairs . You will be given the opportunity to review the charges(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.

As stated in the Student Code: "Behavior by any student, in class or out of class, which for any reason materially disrupts the class work of others involved substantial disorder, invades the rights of others, or otherwise disrupts the regular and essential operation of the University is prohibited.". (Some examples of disruptive behavior may include, but not necessarily limited to, the following: repeated and unauthorized use of electronic devices, cell phones and pagers, disputing authority and arguing with faculty and other students, harassment, physical disruption or physical altercations, etc.)

Any student with a documented disability (e.g., physical learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact Ms. Beth Denhartigh at telephone number 269.387.2116 or email beth.denhartigh@wmich.edu at the beginning of the semester. A disability determination must be made by that office before any accommodations are provided by the instructor.

Class Schedule:

<u>Session</u>	<u>Date</u>	<u>Discussion Topic</u>	<u>Chapter</u>
1	09/07	Introduction to Course Materials, Goals and Objectives, Expectations, Role of Statistics, Role of Statistics, Measurement Scales, Population and Samples, etc.	
2	09/14	Overview of Descriptive and Inferential Statistics, Frequency Distributions, Percentiles, Cumulative Frequency Distributions, Central Tendency and Dispersions.	
3	09/21	Standard Deviation, Standard Scores, The Normal Curve	
4	09/28	Sampling Distributions, Standard Error of the Mean, Central Limit Theorem, Skewness, Kurtosis	
5	10/05	Correlation: The Measure of Relationship. Correlation Coefficients. Introduction to Inferential Statistics	
6	10/12	Hypothesis Testing: Type I & Type II Error	
7	10/19	T-tests; One Sample, Two Independent Samples, Paired Samples. MID-TERM EXAM	
8	10/26	Chi-Square Analysis; Introduction to Correlation Analysis Individual Presentation of Draft Prospectus	
9	11/02	Correlation Analysis Individual Presentation of Draft Prospectus	
10	11/09	Simple Linear Regression Individual Presentation of Draft Prospectus	
11	11/16	Introduction to Multiple Regression Individual Presentation of Draft Prospectus	
12	11/23	THANKSGIVING BREAK	
13	11/30	Introduction to Analysis of Variance Individual Presentation of Draft Prospectus	
14	12/07	FINAL EXAMINATION	

Selected Bibliography

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- Babbie, E.R. (1973). *Survey research methods*. California: Wadsworth Publishing Company, Inc.
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