

# CEP 932 Quantitative Methods in Educational Research I

## Fall 2008

**Instructor: Dr. Kim Maier**

Email: kmaier@msu.edu Phone: 355-8538  
Class time: MW 10:20 – 11:40 AM Office: 451 Erickson  
TAs: Ifeoma Iyioke ([ibemesii@msu.edu](mailto:ibemesii@msu.edu)) Classroom: C135 Holden Hall  
Min Sun ([sunmin@msu.edu](mailto:sunmin@msu.edu))  
Jo Zhou ([zhouxuec@msu.edu](mailto:zhouxuec@msu.edu))

### Course Content

This course provides an introduction to data analysis and statistical inference. Students learn to describe data (quantitatively and graphically), to select and compute statistical estimates and hypothesis tests, to use computer packages to accomplish these tasks, and to interpret and write about the results of the estimates and tests. Knowledge of basic algebra is needed. Higher mathematics (e.g., trigonometry, calculus) is not used.

### Grading

Grades are criterion-referenced. That is, grades will be assigned based on the percent of the total possible points that you receive on the examinations and the assignments [4.0 > 90%, 3.5 > 80%, 3.0 > 70%, 2.5 > 65%, 2.0 > 60%]. The scores for exams and assignments are weighted as follows:

Quizzes (8)	40%
Homework Assignments (8)	40%
Final	20%

Quizzes are open-book and open-note, and you may use calculators. You are expected to work individually on the quizzes. Make-up quizzes will only be permitted at the discretion of the instructor. The homework will contain tasks and questions that will require you to use a statistical computer program; you will be using computer software (SPSS or SAS Enterprise) that is available on MSU microlab computers (use of other statistical programs must be approved by the instructor). You may work in groups of three or less on your homework assignments—teams of students should turn in a single copy of the group homework with all names listed; all group members will receive the same grade. Except at the discretion of the instructor (arranged prior to the due date), all assignments must be submitted at the beginning of class on the day that they are due.

### Textbooks

**Required:** Ott, R.L. and Longnecker, M. (2001). *An Introduction to Statistical Methods and Data Analysis* (5<sup>th</sup> ed.). Pacific Grove, CA: Duxbury. [This book is denoted O in the readings list below.]

### Computer Software

You will be required to use statistical analysis software to complete some assignments. Either SPSS or SAS software should be chosen. Both are available on MSU microlab computers. SPSS is a Windows package that is primarily menu-driven. SAS Enterprise can be used to provide a menu-driven

environment for the command-driven SAS software. There are a number of resources that can be used to learn how to use the software. Those who prefer to consult a book might find the following references helpful:

### SAS

- Cody, R.P., & Smith, J.K. (1997). *Applied Statistics and the SAS Programming Language* (4<sup>th</sup> ed.). Upper Saddle River, NJ: Prentice Hall.
- Delwiche, L. D., & Slaughter, S. J. (2004). *The Little SAS Book* (3<sup>rd</sup> ed.). Cary, NC: SAS Institute.
- Elliott, Rebecca J. (2000). *Learning SAS in the Computer Lab* (2<sup>nd</sup> ed.). Pacific Grove, CA: Brooks/Cole.

### SPSS

- Foster, J. J. (1998). *Data Analysis using SPSS for Windows*. Thousand Oaks, CA: Sage Publications.
- George, D. & Mallery, P. (2005). *SPSS for Windows Step by Step: A Simple Guide and Reference* (5<sup>th</sup> ed. Covers SPSS 12.0; 4<sup>th</sup> ed. Covers 11<sup>th</sup> edition). Allyn and Bacon.
- Norusis, M. J. (2004). *SPSS 12.0 Guide to Data Analysis*. Englewood Cliffs, NJ: Prentice-Hall.

There are also a number of on-line resources that you might find helpful. UCLA Academic Technology services offer exceptional webpages for SAS and SPSS:

For SAS: <http://www.ats.ucla.edu/stat/sas/>

For SPSS: <http://www.ats.ucla.edu/stat/spss/>

### **Additional Resources:**

A number of students over the past semesters have recommended a number of books that they found helpful. Most of these books could be considered to be a 'more gentle' introduction to statistics. In general, these resources give a broad overview of the subject but do not go into any single topic deeply. While none of these resources would be a substitution for the course textbook, you may find them useful as additional sources. Many are available in the library, either as listed or as earlier editions.

Gonick, L. & Smith, W. (1994). *The Cartoon Guide to Statistics*. Harper Resource.

Kranzler, J.H. (2002). *Statistics for the Terrified* (3<sup>rd</sup> ed.). Prentice-Hall.

Levine, D.M. & Stephan D.F. (2004). *Even You Can Learn Statistics: A Guide for Everyone Who Has Ever Been Afraid of Statistics*. Prentice-Hall.

*Please note: MSU seeks to ensure that its programs are accessible to all persons. Students in need of special assistance or an accommodation regarding any of the course requirements as outlined in the syllabus and discussed in class are advised to notify me immediately. We will meet privately to discuss a resolution of your issue, which may or may not include an appropriate referral. Confidentiality will be maintained regarding your special needs.*

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**SCHEDULE FOR CLASSES & READINGS**

<b>Dates</b>	<b>Topic</b>	<b>Readings</b>	<b>Overheads</b>	<b>Due</b>
8/25	Introduction Collecting Data	O1, 2, 20	c1.pdf	
8/27	Introduction Collecting Data	O1, 2, 20	c1.pdf	
9/1	NO CLASS			
9/3	Descriptive Statistics	O3	c3.pdf	Quiz #1
9/8	Descriptive Statistics	O3	c3.pdf	
9/10	Descriptive Statistics	O3	c3.pdf	
9/15	Descriptive Statistics	O3	c3.pdf	Homework #1
9/17	SPSS	Handout		
9/22	Probability & Probability Distributions	O4	c4.pdf	Quiz #2
9/24	Probability & Probability Distributions	O4	c4.pdf	Homework #2
9/29	Probability & Probability Distributions	O4	c4.pdf	SPSS Module
10/1	Comparing means: z-tests and t-tests	O5	c56.pdf	Quiz #3
10/6	Comparing means: z-tests and t-tests	O5	c56.pdf	Homework #3
10/8	Comparing means: z-tests and t-tests	O5	c56.pdf	
10/13	Comparing means: z-tests and t-tests	O5, 6	c56.pdf	
10/15	Comparing means: z-tests and t-tests	O6	c56.pdf	Quiz #4
10/20	Comparing means: z-tests and t-tests	O6	c56.pdf	Homework #4
10/22	Comparing means: z-tests and t-tests	O6	c56.pdf	
10/27	Comparing variances: Chi-square and F-statistics	O7	c7.pdf	Quiz #5
10/29	Categorical Data: Chi-square tests	O10	c10.pdf	Quiz #6
11/3	Categorical Data: Chi-square tests	O10	c10.pdf	Homework #5
11/5	Categorical Data: Chi-square tests	O10	c10.pdf	
11/10	Categorical Data: Chi-square tests	O10	c10.pdf	

11/12	Categorical Data: Chi-square tests	O10	c10.pdf	Homework #6
11/17	Correlation & Regression	O11	c11.pdf	Quiz #7
11/19	Correlation & Regression	O11	c11.pdf	
11/24	NO CLASS			
11/26	Correlation & Regression	O11	c11.pdf	Homework #7
12/1	Correlation & Regression	O11	c11.pdf	
12/3	Correlation & Regression	O11	c11.pdf	Quiz #8
	<b>FINAL EXAM</b>			