

**GEORGE MASON UNIVERSITY  
COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT  
EDUCATIONAL PSYCHOLOGY**

**EDRS 811 (001)**

**Quantitative Methods in Educational Research**

Spring 2010, Tuesday 4:30pm – 7:10pm

Innovation Hall Rm 326

**PROFESSOR**

**Name:** Michelle M. Buehl, PhD

**Office phone:** (703) 993-9175

**Office location:** Robinson A Room 353 E

**Office hours:** Tues. 3:00pm- 4:00pm, Wed. 4:00pm – 6:00pm or by appointment

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**COURSE DESCRIPTION**

The purpose of this course is to develop students' understanding of statistical ideas and procedures required for conducting statistical analyses and applications of quantitative methods in the practice of educational research. The course will reinforce and build upon concepts and skills acquired in EDRS 620. Students will learn through a combination of reading assignments, hands-on experience in using a computer program for data analysis, and application activities. Students will be expected to identify and report on quantitative methods used in published research (i.e., journal articles), to analyze data using the Statistical Package for Social Sciences (SPSS), and to provide written reports of methodology and results. *Prerequisites:* Successful completion of EDRS 620 (or its equivalent) or permission of instructor.

**NATURE OF COURSE DELIVERY**

This course will be taught using lectures, discussions, and group activities in a computer classroom. The course is technology-enhanced using Blackboard (<http://courses.gmu.edu>). Students are expected to have a MESA account (go to <http://password.gmu.edu> to set an account) and are responsible for any information posted on the Blackboard site.

For assistance with Blackboard students may email [courses@gmu.edu](mailto:courses@gmu.edu), call (703) 993-3141, or go to Johnson Center Rm 311 (office hours: 8:30am-5pm). For general technical assistance, students may call (703) 993-8870 or go to the counter in Innovation Hall.

**REQUIRED TEXT**

Dimitrov, D. M. (2008). *Quantitative research in education*. New York: Whittier Publications.

**RECOMMENDED TEXT**

American Psychological Association. (2010). *Publication manual of the American Psychological Association* (6<sup>th</sup> ed.). Washington, DC: Author.

**STATISTICAL SOFTWARE**

Students are *not* required to purchase statistical software for this course. However, assignments will require the use of SPSS. This program is available for use in the computer labs on campus. Options for purchasing SPSS can be investigated at [http://www.spss.com/vertical\\_markets/education/online.htm](http://www.spss.com/vertical_markets/education/online.htm), including an option to lease the program from six months to one year (<http://estore.e-academy.com/index.cfm?loc=spss/main>).

**COURSE REQUIREMENTS**

It is expected that student will:

- (1) Read all assigned materials before coming to class.
- (2) Participate in classroom activities that reflect critical reading of materials.
- (3) Complete in class and homework assignments and quizzes.
- (4) Design and conduct a mini-research study.
- (5) Complete an in class midterm and final examination.
- (6) Attend each class session.

## COURSE EVALUATION

### 1. Quizzes (5%)

A brief quiz (i.e., 10 minutes) will be given at the start of every other class session, assessing material discussed since the last quiz. Students who miss a quiz may not make up the quiz unless previous arrangements have been made. The lowest quiz grade will be dropped. Students may bring one 8.5 x 11 piece of paper with notes on the front and back and should also have their own calculator for each quiz.

### 2. In-Class/Homework Assignments (20%)

Students will complete homework assignments throughout the semester. These assignments are meant to apply and practice the course material.

For assigned problem sets, handwritten work is acceptable but should be neat and readable. When referring to computer printouts please cut and paste the appropriate output into your homework so that it is clear where you got the numbers provided in your response. Be sure to label and explain clearly. Students may consult with each other for these assignments but each student is to turn in a complete homework assignment that represents their own work.

### 3. Midterm and Final Examination (25% each—50% total)

Two exams will be given, as indicated in the course schedule, assessing material from the course.

### 4. Mini-Research Study (25%)

Working individually or in pairs, students will develop and conduct a mini-research study using data from an educational setting that reflects what they have learned from the course. Specifically, the following analyses must be included: 1) Chi-square test for association, 2) Multiple regression, and 3) ANCOVA or Two-Way ANOVA. For the study, students may collect data or use existing data, but may not create data. (Note that the collection of new data may require HSRB approval.). A research paper describing the study is due Thursday, May 6, 2010. The paper should be written using the APA Publication Manual Guidelines and contain the following (see Appendix for rubric):

1. *Introduction*: Identify broad topic of interest; conduct a *brief* literature review; discuss significance of the proposed study; state purpose and hypotheses/research questions.
2. *Methods*: Describe sample, measures, procedures/data collection, and data analysis.
3. *Results*: Describe the results of analyses conducted in test and include appropriate tables and figures. Note: All students should include at least one table as part of their final paper, using appropriate APA formatting.
4. *Discussion and Conclusions*: Discuss the meaning of the findings as they relate to the broader literature, identify limitations, and discuss directions for future research.
5. *Reflection on the process*: After completing the research study, reflect on that experience. What did you learn from it? How do you think course material helped you carry out the study?

### Grading Policy

Your final grade for this class will be based on the following:

A+ = 98 – 100%	A = 93 – 97.99%	A- = 90 – 92.99%
B+ = 88 – 89.99%	B = 83 – 87.99%	B- = 80 – 82.99%
C = 70 – 79.99%	F < 70%	

**COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT STATEMENT OF EXPECTATIONS:**

All students must abide by the following:

- Students are expected to exhibit professional behavior and dispositions. See [gse.gmu.edu](http://gse.gmu.edu) for a listing of these dispositions.
- Students must follow the guidelines of the University Honor Code ([http://www.gmu.edu/catalog/apolicies/#TOC\\_H12](http://www.gmu.edu/catalog/apolicies/#TOC_H12)) for all course assignments.
  - Students must not give or receive unauthorized assistance.
  - Plagiarism is also a violation of the honor code. Please note that:
    - “Plagiarism encompasses the following:
      1. Presenting as one's own the words, the work, or the opinions of someone else without proper acknowledgment.
      2. Borrowing the sequence of ideas, the arrangement of material, or the pattern of thought of someone else without proper acknowledgment.”
 (from Mason Honor Code online at <http://mason.gmu.edu/~montecin/plagiarism.htm>)
    - Paraphrasing involves taking someone else's ideas and putting them in your own words. When you paraphrase, you need to cite the source.
    - When material is copied word for word from a source, it is a direct quotation. You must use quotation marks (or block indent the text) and cite the source.
    - Electronic tools (e.g., SafeAssign) may be used to detect plagiarism if necessary.
    - Plagiarism and other forms of academic misconduct are treated seriously and may result in disciplinary actions.
- Students must agree to abide by the university policy for Responsible Use of Computing. See <http://mail.gmu.edu> and click on Responsible Use of Computing at the bottom of the screen.
- Students with disabilities who seek accommodations in a course must be registered with the GMU Disability Resource Center (DRC) and inform the instructor, in writing, at the beginning of the semester. See [www.gmu.edu/student/drc](http://www.gmu.edu/student/drc) or call 703-993-2474 to access the DRC.

**ADDITIONAL CLASS POLICIES****Paper Format**

Research papers should be submitted in APA format with 1 inch margins on all sides, double-spaced, 12-point Times New Roman font, include a separate title page, and be proofread for spelling, grammar, and clarity errors. *Papers not following this format may be automatically reduced by up to a letter grade.*

**Late Assignments**

Assignments are due at the start of class on the assigned due date. If an assignment must be turned in late or outside of class, students may give the assignment to me in person, leave the assignment in my faculty mailbox (Robinson A Room 309), or email the document. If an assignment is left in my mailbox, send an email to indicate that it is there. **DO NOT** slide assignments under my office door. Assignments submitted this way will not be accepted or graded and will be considered missing. Late assignments will be marked down by half a letter grade for each day the assignment is late.

**Computer Use in Class**

All course sessions are currently schedule to be held in Innovation Hall Room 326. Each student in the course will have access to a computer. During class time, please refrain from checking email or conducting activities on the computer that are not directly related to the class session.

**Class Environment**

Help to foster a positive learning environment by respecting the opinions and contributions of others. Also, cell phones should be turned off or put on silent mode so as to not effect the learning of those around you.

**TENTATIVE COURSE SCHEDULE**

<b>Date</b>	<b>Topic</b>	<b>Assigned Reading</b>	<b>Assignment Due Dates</b>
Tues 1/19	Variables and measurement scales Concepts in education research	Chps 1, 4 Review Chps 2, 3, 5  Usher & Pajares (2006)	
Tues 1/26	Review of introductory statistics Hypothesis testing: One- and Two-sample case for the mean	Chps 6 & 7 Chp 8 (pp. 92-95)	
Tues 2/2	Hypothesis testing: One- and Two-sample case for the mean	Chp 8	<b>Quiz 1</b> HW 1: Organizing Data & Normal Distribution
Tues 2/9	Hypothesis testing: One- and Two-sample case for the mean	Chp 8	HW 2a: One-Sample Tests of the Mean
Tues 2/16	Chi-square tests for goodness-of-fit and association	Chp 12 pp. (170-181)	<b>Quiz 2</b> HW 2b: One-Sample Tests of the Mean
Tues 2/23	Correlation Simple regression	Chp 10 (pp. 133-142) Chp 10	HW 3: Chi-square*
Tues 3/2	<b>MIDTERM EXAMINATION</b>		
Tues 3/9	<b>SPRING BREAK</b>		
Tues 3/16	Part and partial correlation Multiple Regression	Chp 11 Chp 13	
Tues 3/23	Multiple regression	Chp 13	
Tues 3/30	One-factor analysis of variance (ANOVA)	Chp 14	<b>Quiz 3</b> HW 4: Multiple Regression
Tues 4/6	One-factor analysis of variance (ANOVA) Online Effect Size Lecture and Activity	Chp 14	Online effect size quiz
Tues 4/13	Analysis of covariance (ANCOVA)	Chp 16	<b>Quiz 4</b> HW 5a: ANOVA
Tues 4/20	Analysis of covariance (ANCOVA) Two-factor ANOVA	Chps 15 & 16	
Tues 4/27	Two-factor ANOVA	Chp 15	<b>Quiz 5</b> HW 5b: ANCOVA
Tues 5/4	<b>READING DAY</b>		Research Paper due Thurs 5/6 by 4:30pm
Tues 5/11	<b>FINAL EXAMINATION</b>		

Notes: 1. Last day to drop no tuition liability: Feb 2<sup>nd</sup>;  
2. Last day to drop with 33% penalty: Feb 9<sup>th</sup>;  
3. Last day to drop (67% penalty): Feb 19<sup>th</sup>

**Appendix**  
**Quantitative Methods in Education Research (EDRS 811)**  
**Research Paper Rubric**

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Semester: \_\_\_\_\_

Grade: \_\_\_\_\_

## GENERAL EVALUATION CRITERIA:

- *Clarity and organization*
- *Comprehensiveness of content*
- *APA style*

**MAXIMUM SCORE: 30 pts**

PERFORMANCE ELEMENTS	POINTS			
	1	2	3	4
<b>Cover page</b>	<b>max = 1 pt</b>			
Clearly organized with title, name, date, and boiler plate (partial fulfillment, Instructor's name, and school) in APA style				
<b>Introduction</b>	<b>max = 5 pts</b>			
a. Statement of the nature of the problem and its importance (include a description of some recent studies related to the issues)				
b. Justification of the need for this study				
c. Statement of specific research questions.				
<b>Methods Section</b>	<b>max = 8 pts</b>			
<b>a. Participants:</b> description of the sample (size, subgroups, demographic characteristics)				
<b>b. Measures:</b> description of the data (instruments, scales, reliability of scores)				
<b>c. Procedures and data collection:</b> description of the data collection method (e.g., using existing records on student)				
<b>d. Statistical Data Analysis:</b> Description of the statistical methods and procedures used to address the research questions in the project				
<b>Results Section</b>	<b>max = 7 pts</b>			
Present the results obtained with the statistical data analysis for each research question				
a. within text of the results section,				
b. in APA formatted tables (each on a separate page after references, NOT SPSS tables), and in APA formatted figures (each on a separate page after tables).				
<b>Discussion/Conclusions Section</b>	<b>max = 7 pts</b>			
a. Conclusions drawn from the results [findings and implications for theory and/or practice]				
b. Statement of limitations				
c. Recommendations for future research				
<b>References and Citations</b>	<b>max = 1 pt</b>			
Inclusion of recent studies appropriately cited in text and in reference list in APA style				
<b>Reflection</b>	<b>max = 1 pt</b>			
Inclusion of a thoughtful reflection on the research study experience and how it contributed to your learning				