EDRS 620 Quantitative Inquiry

( 001 ) in Education

**George Mason University, Graduate School of Education**

**Dr. Dimiter Dimitrov** **Spring, 2009**

**Class Meeting**: Robinson Hall, Room A350; Monday, 4:30 – 7:10pm

**Office: West Building, Room 2007** **Phone:** (703) 993-3842

**Office Hours:** M & T, 3:00 – 4:00pm. **E‑mail:** ddimitro@gmu.edu

Other hours may be arranged by appointment.

### **Course Description**

The main purpose of this course is to develop in the students an understanding of statistical ideas and procedures required for conducting correct statistical analysis and applications of quantitative methods in the practice of educational research.. Students will learn through a combination of text reading assignments, data analysis and interpretation of SPSS printouts (Statistical Package for Social Sciences), and application activities. Students will be expected to identify and report on quantitative methods used in published research (e.g., professional journal articles).

**Prerequisites:** EDRS 590 or equivalent experience.

**Course Methodology:** This course consists of lectures, large group discussion, in class activities, and individual/group assignments.

**Required Text:** Dimitrov, D.M. (2008). **Quantitative Research in Education: *Intermediate &***

 ***Advanced******Methods***. NY: Whittier Publications. ISBN: 978-1-7604-285-4

**Course Requirements**: It is expected that each of you will:

(1) Read all assigned materials for the course.

(2) Participate in classroom activities that reflect critical reading of materials.

(3) Complete two in class assignments and HW assignments.

(4) Design and conduct a pilot research study

(5) Present the pilot research study in class in a poster format.

 (6) Attend each class session.

STUDENT OUTCOMES

* Students will be able to design the basic components of a small-scale quantitative research study including descriptive statistics and inferential statistics
* Students will be able to write clearly and coherently about the conceptual framework, questions and methods used in a research study
* Students will be able to deal appropriately with ethical issues in research
* Students will be able to develop research hypotheses that relate to research questions
* Students will be able to demonstrate an understanding of quantitative research design through completion of a project
* Students will be able to identify threats to internal and external validity in simulated studies and their own research design
* Students will be able to interpret SPSS outputs.
* Students will be able to demonstrate an understanding of power effect size analysis
* Students will be able to evaluate and critique data analysis in published quantitative research articles
* Students will be able to develop and reinforce their critical thinking, problem solving, oral and writing skills

**Course Evaluation**

**1. In class/Homework Assignments:** Students will be asked to work individually on homework assignments throughout the semester.

**2. Midterm Examination (Closed books and notes)**

**3. Pilot Data Analysis Project:** This course requires students to develop and conduct basic data analysis in an educational setting. This work is intended to reflect what you have learned from this course. Other requirements for this course are designed to build up bases for the final pilot data analysis proposal. The data analysis project must be handed in on time and must adhere to the APA Publication Manual Guidelines.

**4. Final Examination: Semi-comprehensive (closed books and notes) examination**

**5. Class Participation and Attendance Policy:** Because of the importance of lecture and discussion to your total learning experience, I wish to encourage you to both attend and participate in class regularly. Attendance, punctuality, preparation, and active contribution to small and large group efforts are essential. These elements of your behavior will reflect the professional attitude implied in the course goals and will account for 10% of your course grade. With reference to the grading scale described later in this syllabus, you will note that this percentage is equivalent to a full letter grade. Students who must miss a class must notify the instructor (preferably in advance) and are responsible for completing all assignments and readings for the next class.

# RUBRIC FOR PARTICIPATION AND ATTENDANCE

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| --- | --- | --- | --- | --- |
|  |  | LEVEL OF**PERFORMANCE** |  |  |
| ELEMENT | **Distinguished (4-5 pts.)**  | **Proficient** **(3 pts.)**  | **Basic** **(2 pts.)**  | **Unsatisfactory (1 or 0 pts.)**  |
| Attendance**&****Participation** | The student attends all classes, is on time, is prepared and follows outlined procedures in case of absence, the student actively participates and supports the members of the learning group and the members of the class. | The student attends all classes, is on time, is prepared and follows outlined procedures in case of absence; the student makes active contributions to the learning group and class. | The student is on time, prepared for class, and participates in group and class discussions. The student attends all classes and if an absence occurs, the procedure outlined in this section of the syllabus is followed. | The student is late for class. Absences are not documented by following the procedures outlined in this section of the syllabus. The student is not prepared for class and does not actively participate in discussions. |

Grading Policy

|  |  |
| --- | --- |
| Class Participation and Attendance | 5 pts. |
| Individual Homework Assignments | 10 pts. |
| Data Analysis Project  | 30 pts |
| Midterm Examination  | 25 pts. |
| FINAL EXAMINATION | 30 pts. |
| **TOTAL** | **100 pts** |

**Letter grades will be assigned as follows**:

 A+ 98-100% A 93‑97.49% A- 90-92.49%

B+ 88‑89.49% B 83-87.49% B- 80-82.49%

C 70‑79.49% F below 70%

**Honor Code**

All evaluations and homework will be taken under the GMU Honor Code. Students are expected to abide by the honor code set forth in the current edition of the Student Handbook. All exams, assignments and papers are honor work. That means that students must not give nor receive any unauthorized assistance. While members of a team may collaborate on written paper assignments, they may not give or receive assistance from other teams. Plagiarism is also a violation of the honor code. The University’s Honor Code guidelines for academic honesty are at: http://mason.gmu.edu/~montecin/plagiarism.htm

**Learning Disabilities**

Students with any type of documented disability that may interfere with their learning in this class may negotiate a reasonable accommodation with the instructor. If you have not contacted the Office of Disability Services, and you have a disability please make sure to register for services.

**GSE Statements of Expectations**

The Graduate School of Education (GSE) expects that all students abide by the following:

Students are expected to exhibit professional behavior and dispositions. See gse.gmu.edu for a listing of these dispositions.

Students must follow the guidelines of the University Honor Code. See <http://www.gmu.edu/catalog/apolicies/#TOC_H12> for the full honor code.

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.

**Reading from text Chapter**

Jan. 26 Concepts of measurement in education 1, 2, 3

Feb. 2 Research design 4, 5

Feb. 9 Organizing and graphing data 6

Feb. 16 Normal distribution 7

Feb. 23 Other distributions; *t*-, *F*- and *chi-square* distributions 7

March 2 Hypothesis testing: One-sample case for the Mean 8

*March 9 …………* ***Spring Break***  *………………………….*

March 16 Hypothesis testing: Two-sample case for the Mean 8

**March 23**  **MIDTERM EXAMINATION**

March 30Hypothesis testing for proportions 9

April 6 Correlation between two variables 10

April 13 Simple linear regression 10

April 20 Chi-square tests for frequencies 12

April 27 One-factor Analysis of Variance (ANOVA) 14

May 4 Review and Project Discussion

 [**Projects due by May 9 via e-mail**]

**May 11 FINAL EXAMINATION**

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*Notes*: 1. Additional materials posted on the **Black Board Learning System**

2. Last day to drop with 33% tuition penalty: February 10

 3. Last day to drop with 67% tuition penalty: **February 20**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** **Date:\_\_\_\_\_\_\_\_\_\_\_**

**Semester: \_\_\_\_\_\_\_\_\_\_ Grade: \_\_\_\_\_\_\_ pts.**

**EDRS 620**

**Quantitative methods in education research**

**rubric for research paper**

GENERAL EVALUATION CRITERIA:

 ●  *Clarity and organization*

 ● *Comprehensiveness of content*

 ● *APA style*  TOTAL SCORE: **MAX = 30 pts.**

|  |  |
| --- | --- |
| **performance elements** | **quality points** |
| **1** | **2** | **3** | **4** | **5** |
| **Cover page** clearly organized with title, name, date, and boiler plate (partial fulfillment, Instructor’s name, and school |  |
| **Introduction Section**  a. Statement of the problem, its importance, and some previous studies related to the problem.  b. Justification of the need for this study  c. Statement of research questions.  |  |  |  |  |  |
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|  |  |  |  |  |
| Max ptMA **max = 6 pts.** |
| **Methods Section** 1. **Sample:** description of the **sample**
2. **Data:** description of thedata
3. **Data collection:** description of the data collection method

d. **Statistical Data Analysis**: Description of the statistical methods used to address the research questions in the project  |  |  |  |  |  |
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|  Mx **max = 8 pts.** |
| **Results Section** [Presentation of results obtained with the statistical data analysis for each research question] **Relevance, accuracy, completeness, and APA style of the results** 1. within text of the results section,
2. tables (each on a separate page) after references
3. figures (each on a separate page) after tables

  |  **quality points** 1**1 2 3 4 5** |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|   Mm **max = 8 pts**. |
| 1. **Discussion/Conclusions Section**

 a. Conclusions drawn from the results 1. Statement of limitations

  c. Recommendations for future research .  |  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  **max = 8 pts**. |