

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

EDRS 620 001: Quantitative Inquiry in Education
3 Credits, Spring 2016
Thursdays, 4:30 – 7:10pm Room L013 Thompson Hall

PROFESSOR

Name: Todd M. Johnson, M.Ed.
Office hours: Thursday 3:00 – 4:00pm and by appointment
Office location: West Room 2104
Office phone: please contact via e-mail
Email address: tjohnsob@gmu.edu

CATALOG COURSE DESCRIPTION

This course examines fundamental concepts and methods of statistics as applied to educational problems, including descriptive and inferential statistics.

SPECIFIC COURSE DESCRIPTION

EDRS 620 is a graduate quantitative analysis course that facilitates student understanding of the basic concepts, and principles of descriptive and inferential statistics. The course explores hypothesis testing, correlational techniques, t-tests, analysis of variance, post-hoc comparison, factorial designs, regression, and non-parametric statistics. An emphasis is placed on comprehension, skill development and application of statistical knowledge to quantitative inquiry in education. Students learn through a combination of text reading assignments, data analysis and interpretation of SPSS printouts (Statistical Package for Social Sciences), and application activities. The course lays the foundation for advanced study of quantitative analysis for students desiring to continue their studies in this endeavor.

Prerequisite: EDRS 590 or equivalent experience

TK20 PERFORMANCE-BASED ASSESSMENT SUBMISSION REQUIREMENT

Every student registered for any Educational Psychology course with a required performance-based assessment is required to submit this assessment, (the Final Exam) to Tk20 through Blackboard (regardless of whether the student is taking the course as an elective, a onetime course or as part of an undergraduate minor). Evaluation of the performance-based assessment by the course instructor will also be completed in Tk20 through Blackboard. Failure to submit the assessment to Tk20 (through Blackboard) will result in the course instructor reporting the course grade as Incomplete (IN). Unless the IN grade is changed upon completion of the required Tk20 submission, the IN will convert to an F nine weeks into the following semester.

REQUIRED MATERIALS:

1. Gravetter, F. J. & Wallnau, L. B. (2011). *Essentials of Statistics for the Behavioral Sciences* (8th ed.). Belmont, CA: Wadsworth/Thomson Learning. ISBN:978-1-133-95657-0

2. Access to SPSS software. There are computer labs on campus that provide access to SPSS. You can access SPSS software through GMU's virtual computer library at www.vcl.gmu.edu. Information about how to use the virtual computer library is available at http://itservices.gmu.edu/services/viewservice.cfm?custome1_dataPageID_4609=5689.

It is the student's responsibility to ensure access to SPSS outside of class time as there will not be sufficient time in class to complete required assignments.

3. A simple nonprogrammable calculator that has a square root function.

Related Resource:

American Psychological Association. (2009). *Publication manual of the American Psychological Association*. 6th Ed. Washington, D. C.: American Psychological Association.

NATURE OF COURSE DELIVERY

The class sessions will include lecture, small group discussion, and discussion of SPSS output in a computer classroom. *Questions are encouraged*. The lab portion of the class will provide time for hands-on computer work that is directly related to the homework and course goals.

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 course Blackboard site. For assistance with Blackboard students may email courses@gmu.edu, call (803) 993-3141, or go to Johnson Center Rm 311 (office hours: 8:30 am-5 pm). For general technical assistance, students may call (703) 993-8870 or go to the counter in Innovation Hall.

COURSE EXPECTATIONS

It is expected that students 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 assignments, homework assignments, and quizzes
4. Complete an in class midterm and final examination
5. Attend each class session

ADDITIONAL CLASS POLICIES

Late Assignments

Assignments are due at the start of class on the assigned due date. Late assignments will be marked down 5% for each day the assignment is late.

Electronic Device Use in Class

During class time, please refrain from checking email or conducting activities on the computer, cell phone or other electronic device 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 affect the learning of those around you.

COURSE GOALS

By the end of the semester, it is expected that students will be able to:

1. Understand basic concepts, terminology, and assumptions pertinent to statistical analyses
2. Identify the type of statistic appropriate for a given research question
3. Use basic inferential statistics to test hypotheses
4. Interpret statistical findings
5. Compute, by hand and computer, basic statistical analyses
6. Write clearly and coherently about the conceptual framework, research questions and methods used in a study
7. Report statistical results in correct APA format

RELATIONSHIP TO PROGRAM STANDARDS

In this course, the following Educational Psychology program standards will be addressed:

Standard 3: Knowledge of Educational Research and Assessment. Candidates will demonstrate an understanding of the basic concepts, principles, techniques, approaches, and ethical issues involved in educational research.

Standard 4: Analysis, Critique, and Evaluation of Educational Research. Candidates will use their knowledge of quantitative and qualitative research methodology to critically read and evaluate quantitative and qualitative research articles.

Standard 6: Communication and Dissemination of Educational Research. Candidates will demonstrate critical thinking, oral presentation, technological, and writing skills as they are used in the profession. These include: a. Knowledge and use of APA style, b. Oral presentations, c. Poster presentations, d. Article abstracts, e. Research proposals, f. Literature reviews, and g. Technological skills.

STATISTICS STUDY TIPS

1. Read widely; then read some more.
2. 'Google' difficult concepts. There is lots of helpful statistical information on the web.
3. Check for understanding frequently. This means that when a formula is presented, take time to see if you can explain how the formula works. If Greek letters are difficult for you, write out what each letter means.
4. Complete as many questions/problems as possible at the end of the chapters.
5. Develop examples of research questions and hypotheses that are appropriate for each statistical technique.
6. Form a study group.

7. Start the homework as soon as possible after class; waiting until the night before it is due does not help you process the material.

COURSE EVALUATION

1. Quizzes (10%)

Timed online quizzes (via Blackboard) will be given once a week, assessing material discussed since the last quiz. Students are expected to complete the quizzes independently by noon on the day indicated and may use only one 8.5 x 11 piece of paper with notes on the front and back. Students who miss a quiz may not make up the quiz unless previous arrangements have been made. The lowest quiz grade will be dropped. Quizzes are designed to provide students (and instructor) feedback about students' course progress. The quizzes are meant to help students isolate key concepts from the class period and to focus their study time.

2. Homework Assignments (20%)

Students will complete homework assignments throughout the semester. All assignments will be posted on Blackboard and are due at the beginning of the class on the due date. 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. Questions will ask students to explain statistical concepts, work out problems, and or run analyses using SPSS and interpret results. Students should show all of the work for any problem completed. When referring to computer printouts cut and paste the appropriate output into the homework assignment. 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. Students should retain a copy of all submitted homework assignments.

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

The two exams, as indicated in the course schedule, will be given assessing material from the class and textbook (e.g., conceptual questions, application of skills, interpretation of SPSS output) using multiple choice, matching, and short answer questions.

4. Article Summaries (10% each—20% total)

Students will complete two article summaries with a particular emphasis on the research questions, methods, analysis, and results. For the first article summary, students will respond to a series of questions using an article that has been selected by the instructor. For the second article summary, each student may select from options provided by the instructor or identify an empirical journal in the student's area of interest that includes both ANOVA and correlation. Students will read the entire article, identify key components of the methods/analysis and write a short commentary/critique (2 pages maximum) of the Methods & Analysis section. Helpful hint: *Pay attention to the methods and analyses sections of articles from other courses or research projects. These are great candidates for this course requirement.*

Grading Policy

Each student's final grade for the 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%	

GMU POLICIES AND RESOURCES FOR STUDENTS

- Students must adhere to the guidelines of the George Mason University Honor Code [See <http://oai.gmu.edu/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 must 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 (i.e., Author, Year, page number).
 - 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 follow the university policy for Responsible Use of Computing [See <http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/>].
- Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to the students solely through their Mason email account.
- The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (i.e., individual and group counseling, workshops and outreach programs) to enhance students’ personal experience and academic performance (See <http://caps.gmu.edu/>).
- Students with disabilities who seek accommodations in a course must be registered with the George Mason University Office of Disability Services (ODS) and inform their instructor, in writing, at the beginning of the semester [See <http://ods.gmu.edu/>].
- Students must follow the university policy stating that all sound emitting devices shall be turned off during class unless otherwise authorized by the instructor.
- The George Mason University Writing Center staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support

students as they work to construct and shared knowledge though writing (See <http://writingcenter.gmu.edu/>).

PROFESSIONAL DISPOSITIONS

Students are expected to exhibit professional behaviors and dispositions at all times. In particular, students are reminded of the following dispositions identified by CEHD and the Educational Psychology program:

CEHD Dispositions

- I. **Commitment to the Profession** (e.g., promoting exemplary practice, excellence in teaching and learning)
- II. **Commitment to Honoring Professional Ethical Standards** (e.g., fairness, honesty, integrity, respect for colleagues and students)
- III. **Commitment to Key Elements of Professional Knowledge** (e.g., belief that all students can learn, high standards, respect for diverse talents, abilities, and perspectives)
- IV. **Commitment to Being a Member of a Learning Community** (e.g., self and collective improvement, responsibility, collaboration)
- V. **Commitment to Democratic Values and Social Justice** (e.g., respect for opinions and dignity of others, appreciate and integrate multiple perspectives)

Educational Psychology Dispositions

- I. **Commitment to the field of Educational Psychology** (e.g., excellence in applying research to teaching, learning, and assessment)
- II. **Commitment to ethical research with human subjects** (e.g., respect for persons, beneficence—do not harm, justice)
- III. **Commitment to empirical inquiry** (e.g., commitment to research-based evidence to inform decisions, value methodological rigor in research)
- IV. **Commitment to the Learner-Centered Principles of the American Psychological Association** (e.g., cognitive and metacognitive, motivational and affective, development and social, and individual difference factors;
<http://www.apa.org/ed/governance/bea/learner-centered.pdf>)

See for more information on these dispositions:

http://cehd.gmu.edu/assets/docs/educational_psychology/EdPsy%20CV,%20PS,%20Disp,%20Sig.pdf

CORE VALUES COMMITMENT

The College of Education and Human Development is committed to collaboration, ethical leadership, innovation, research-based practices, and social justice. Students are expected to adhere to these principles: <http://cehd.gmu.edu/values/> .

For additional information on the College of Education and Human Development, Graduate School of Education, please visit our website [See <http://gse.gmu.edu/>].

COURSE SCHEDULE		
Date	Topics	Reading & Assignments Due (all chapters should be read prior to the class meeting for the day they are assigned)
1/21	Course Info Intro to Statistics & Frequency Distributions Intro to SPSS	Read: Chapter 1 & 2 Appendix A: Basic Math Review
1/28	Central Tendency Variability	Read: Chapter 3& 4
2/4	Z-scores: location Standard Distributions	Read: Chapter 5 Homework #1 due
2/11	Probability	Read: Chapter 6
2/18	Distributions of Sample Means	Read: Chapter 7
2/25	Hypothesis Testing and Power	Read: Chapter 8 Homework #2 due
3/3	Midterm Exam	
3/10	<i>Spring Break – no class</i>	
3/17	The t distribution	Read: Chapter 9
3/24	T-tests	Read: Chapter 10 & 11
3/31	ANOVA	Read: Chapter 12 Article Summary #1 due
4/7	Correlation & Simple Regression	Read: Chapter 14

		Homework #3 Due
4/14	Chi-square	Read: Chapter 15
4/21	ANOVA: Repeated Measures & Factorial	Read: Chapter 13 Homework #4 Due
4/28	Review	Article Summary 2 Due
5/5	Final Exam	