

**George Mason University  
College of Education and Human Development  
Educational Psychology**

**EDRS 620 (B01)  
Quantitative Inquiry in Education (3 credits)  
Summer 2024, Session B  
Monday & Wednesday 4:30pm-7:10pm  
via Zoom (see schedule)**

**Faculty**

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**Prerequisites/Corequisites**

Required: EDRS 590 (with a B or better) or equivalent experience

**University Catalog Course Description**

Examines fundamental concepts and methods of statistics as applied to education problems, including descriptive and inferential statistics.

**Course Overview**

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 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 R/R studio, and to provide written report of methodology and results.

**Course Delivery Method**

This course will be delivered 100% online using a primarily synchronous format via Blackboard Learning Management system (LMS) housed in the MyMason portal. You will log in to the Blackboard (Bb) course site using your Mason email name (everything before @masonlive.gmu.edu) and email password. The course site will be available on Wednesday, May 29, 2024 before 4:30pm.

**Under no circumstances, may candidates/students participate in online class sessions (either by phone or Internet) while operating motor vehicles. Further, as expected in a face-to-face class meeting, such online participation requires undivided attention to course content and communication.**

### Technical Requirements

To participate in this course, students will need to satisfy the following technical requirements:

- High-speed Internet access with standard up-to-date browsers. To get a list of Blackboard's supported browsers see:  
[https://help.blackboard.com/Learn/Student/Ultra/Getting\\_Started/Browser\\_Support](https://help.blackboard.com/Learn/Student/Ultra/Getting_Started/Browser_Support)
- Students must maintain consistent and reliable access to their GMU email and Blackboard, as these are the official methods of communication for this course.
- Students will need a microphone and camera to participate in class sessions.
- Students may be asked to create logins and passwords on supplemental websites and/or to download trial software to their computer or tablet as part of course requirements.
- The following software plug-ins for PCs and Macs, respectively, are available for free download: [Add or delete options, as desire.]
  - Adobe Acrobat Reader: <https://get.adobe.com/reader/>
  - Windows Media Player:  
<https://support.microsoft.com/en-us/help/14209/get-windows-media-player>
  - Apple Quick Time Player: [www.apple.com/quicktime/download/](http://www.apple.com/quicktime/download/)

### Expectations

- Course Week: Our course week will begin on the day that our synchronous meetings take place as indicated on the Schedule of Classes.
- Log-in Frequency: Students must actively check the course Blackboard site and their GMU email for communications from the instructor, class discussions, and/or access to course materials at least two times per week. In addition, students must log-in for all scheduled online synchronous meetings.
- Participation: Students are expected to actively engage in all course activities throughout the semester, which includes viewing all course materials, completing course activities and assignments, and participating in course discussions and group interactions.
- Technical Competence: Students are expected to demonstrate competence in the use of all course technology. Students who are struggling with technical components of the course are expected to seek assistance from the instructor and/or College or University technical services.
- Technical Issues: Students should anticipate some technical difficulties during the semester and should, therefore, budget their time accordingly. Late work will not be accepted based on individual technical issues.
- Workload: Please be aware that this course is **not** self-paced. Students are expected to meet *specific deadlines* and *due dates* listed in the **Class Schedule** section of this syllabus. It is the student's responsibility to keep track of the weekly course schedule of topics, readings, activities and assignments due.
- Instructor Support: Students may schedule a one-on-one meeting to discuss course requirements, content or other course-related issues. Those unable to come to a Mason campus can meet with the instructor via telephone or

web conference. Students should email the instructor to schedule a one-on-one session, including their preferred meeting method and suggested dates/times.

- Netiquette:

The course environment is a collaborative space. Experience shows that even an innocent remark typed in the online environment can be misconstrued. Students must always re-read their responses carefully before posting them, so as others do not consider them as personal offenses. *Be positive in your approach with others and diplomatic in selecting your words.* Remember that you are not competing with classmates, but sharing information and learning from others. All faculty are similarly expected to be respectful in all communications.

- Accommodations:

Online learners who require effective accommodations to insure accessibility must be registered with George Mason University Disability Services.

## Learner Outcomes or Objectives

This course is designed to enable students to do the following:

- (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;
- (3) Interpret statistical findings;
- (4) Compute, by hand and computer, basic statistical analyses;
- (5) Design the basic components of a small-scale quantitative research study;
- (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.

## Alignment with Program Standards (Updated May 2021)

Standard 2. Candidates will apply their knowledge of quantitative and qualitative research methods, including basic concepts, principles, techniques, and ethical issues, to read and critique relevant products of research.

Standard 3. Candidates will apply their knowledge and skills of quantitative and qualitative research methods, including basic concepts, principles, techniques, and ethical issues, to conduct research and/or inform practice in diverse applied settings.

Standard 4. Candidates will demonstrate oral and written communication relevant to educational psychology, including knowledge and use of APA style and professional formats (e.g., oral presentations, poster presentations, article abstracts, literature reviews, research proposals, reports).

Standard 5. Candidates will demonstrate professional dispositions relevant to educational psychology such as critical thinking, collaboration, interpersonal communication, intercultural competence, ethical leadership, professionalism, and technological skills.

### Required Texts

Privitera, G. J. (2019). *Essential statistics for the behavioral sciences* (2nd ed.). Sage.

### Required Materials

- (1) Access to R/Rstudio. R software is free download: <https://www.r-project.org/> . There are videos provided on Bb that walk you through the installation and basic usage of R/Rstudio. There are also computer labs on campus that provide access to R/Rstudio. It is the student's responsibility to ensure access to R/Rstudio outside of class time as there will not be sufficient time in class to complete required assignments.
- (2) A simple nonprogrammable calculator that has a square root function. A phone will work fine for homework assignments; however your phone may NOT be used during exams

### Recommend Resource:

American Psychological Association. (2020). *Concise guide to APA style (7th ed.)*.

\*The standard version of the publication manual is also acceptable.

### 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.

### Class Format

The class sessions will include lecture, small group discussion, and discussion of R output. **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. For this synchronous online course, students are expected to have their camera on and to actively participate.

### Class Preparation

Students are expected to come to class on time having read the applicable textbook chapter and watched any asynchronous content found on the Blackboard site for that class session. Information on course assignments, weekly quizzes, and class lectures are available on the course Blackboard site.

### Course Performance Evaluation

Students are expected to submit all assignments on time in Blackboard.

- **Assignments and/or Examinations**

### ***1. Quizzes (10%)***

Timed online quizzes (usually 25 minutes) will be given once a week via Blackboard, assessing material discussed since the last quiz. The quizzes are composed of short answer and multiple-choice items which will cover the basic concepts presented in class and in the textbook. **Students are expected to complete the quizzes independently by noon on the day indicated.** Quizzes are designed to provide students (and instructor) feedback about students' course progress. Students who miss a quiz may not make up the quiz unless previous arrangements have been made. The lowest, non-missed quiz grade will be dropped. Quiz grades cannot lower students' overall course grade (unless they received 0's on quizzes due to failure to complete them). Students are encouraged to take the quizzes soon after the class meeting using only one 8.5 x 11 piece of paper with notes on the front and back. Remember the purpose of the quiz is to help isolate key concepts from the class period and to focus 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 homework, handwritten work is acceptable but should be neat, readable, and submitted as an electronic document. Questions will ask students to explain statistical concepts, work out problems, and or run analyses and interpret results. Students should show all of the work for any problem completed and include appropriate computer printouts (**please cut and paste from software output to Word**). Students may consult with each other for homework assignments but each student is to turn in their own complete homework assignment and write up of results. 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 output) using multiple choice, matching, and short answer questions.

### ***4. Article Summaries/Understanding Research Article Methods and Analysis (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 the required statistical tests. Students will read the entire article, identify key components of the methods/analysis and write a short commentary/critique (3 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.*

- **Other Requirements**

### 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

### Class Attendance & Participation

It is expected that all students will read assigned materials before coming to class, view any asynchronous content including watching all video lectures, come to class on time, participate in class discussions/activities with their cameras on, and complete in-class assignments. Each class session will include: questions and answers on lecture content, going over key components of lecture material, and lab work to practice the material. The lab portion of the class will include time for hands-on computer work that is directly related to the homework and course goals. Questions are encouraged.

### Late Assignments

Unless otherwise indicated, assignments are in Blackboard at the start of class on the assigned due date. If an assignment must be turned in late, post the document to Blackboard. If an assignment must be turned in as a hard copy (e.g., due to technology problem), give the assignment to me in person or leave the assignment in my faculty mailbox (West Room 2108). 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. 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.

- **Grading**

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%	

### Professional Dispositions

See <https://cehd.gmu.edu/students/policies-procedures/>

**Class Schedule**

Note: Faculty reserves the right to alter the schedule as necessary, with notification to students.

<b>Date</b>	<b>Class</b>	<b>Topic</b>	<b>Reading/Assignment Due</b>
5/29	1	Course Info Intro to Statistics Frequency Distributions Central Tendency	Ch. 1 -3  Appendix A: Basic Math Review  <b>Student Information “Quiz” due Friday 5/31</b>
6/3	2	Variability Z-scores Standard Distributions	Ch. 4 & 5  <b>Quiz #1</b>
6/5	3	Distributions of Sample Means Standard Error  <i>Asynchronous Class Session</i>	Ch. 6  <b>HW #1: Distributions, Measures of Central Tendency and Variability</b>
6/10	4	Hypothesis Testing: Significance, Effect Size, & Power	Ch. 7  <b>Quiz #2</b>
6/12	5	The t distribution  <i>6pm stop time—watch asynchronous video(s) before class</i>	Ch. 8  <b>HW #2: Z-Scores and the Normal Distribution</b>
6/17	6	Independent and Dependent t-Tests	Ch. 9 & 10  <b>Quiz #3</b>
6/19		No Class—Juneteenth	<b>HW #3: Hypothesis Tests of the Mean due Friday, 6/21</b>
6/24	7	Catch up/Review	<b>Quiz #4</b>
6/26	8	<b>MIDTERM EXAM</b> <i>Online synchronous</i>	

7/1	9	ANOVA: One-way	Ch. 11 <b>Article Summary #1</b>
7/3	10	ANOVA: Post hocs and within subjects <i>Asynchronous Session?</i>	Ch. 11 (continued) <b>HW #4: ANOVA</b>
7/8	11	Correlation & Simple Regression	Ch. 13 <b>HW #4: ANOVA</b> <b>Quiz #5</b>
7/10	12	Reading Multiple Regression  Chi-Square: Test for Goodness of Fit and Independence	Usher & Pajares (2006)  Ch. 14 <b>HW#5: Correlation and Simple Regression</b>
7/15	13	ANOVA: Two-way	Ch. 12 <b>HW #6: Chi-Square</b> <b>Quiz #6</b>
7/17	14	ANOVA: Two-way (cont.) Final Exam Review	<b>HW #7: ANOVA (cont.) and Synthesis of the Semester</b>  <b>Article Summary #2</b>
7/22	Exam Period	<b>FINAL EXAM</b> <i>Online synchronous</i>	

Note:

- a) Quizzes and exams will be administered online.
- b) Faculty reserves the right to alter the schedule as necessary, with notification to students.



## Core Values Commitment

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

## GMU Policies and Resources for Students

### *Policies*

- Students must adhere to the guidelines of the Mason Honor Code (see <https://catalog.gmu.edu/policies/honor-code-system/> ).
  - 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 may be used to detect plagiarism if necessary.
    - Plagiarism and other forms of academic misconduct are treated seriously and may result in disciplinary actions.
    - When explicitly stated by the instructor or suggested and discussed in advance with the class, Generative AI tools are allowed on the named assignment or activities. When Generative AI is used, a clear account of how Generative AI was used and citation of the tool used is required. It is the professor’s discretion to downgrade work that uses Generative AI if the resulting work does not sufficiently reflect the students’ own thinking and writing. Using Generative AI on any assignment not specified and or not reporting use of Generative AI is considered a violation of the Academic Integrity policy.
- Students must follow the university policy for Responsible Use of Computing (see <https://universitypolicy.gmu.edu/policies/responsible-use-of-computing/>).
- Students are responsible for the content of university communications sent to their Mason 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 students **solely** through their Mason email account.
- Students with disabilities who seek accommodations in a course must be registered with George Mason University Disability Services. Approved accommodations will begin at the time the written letter from Disability Services is received by the instructor (see <https://ds.gmu.edu/>).
- Students must silence all sound emitting devices during class unless otherwise authorized by the instructor.

*Campus Resources*

- Support for submission of assignments to VIA/SLL should be directed to [viahelp@gmu.edu](mailto:viahelp@gmu.edu) or <https://cehd.gmu.edu/aero/assessments>.
- Questions or concerns regarding use of Blackboard should be directed to <https://its.gmu.edu/knowledge-base/blackboard-instructional-technology-support-for-students/>.
- For information on student support resources on campus, see <https://ctfe.gmu.edu/teaching/student-support-resources-on-campus>

**Notice of mandatory reporting of sexual assault, sexual harassment, interpersonal violence, and stalking:**

As a faculty member, I am designated as a “Non-Confidential Employee,” and must report all disclosures of sexual assault, sexual harassment, interpersonal violence, and stalking to Mason’s Title IX Coordinator per [University Policy 1202](#). If you wish to speak with someone confidentially, please contact one of Mason’s confidential resources, such as [Student Support and Advocacy Center](#) (SSAC) at 703-380-1434 or [Counseling and Psychological Services](#) (CAPS) at 703-993-2380. You may also seek assistance or support measures from Mason’s Title IX Coordinator by calling 703-993-8730, or emailing [titleix@gmu.edu](mailto:titleix@gmu.edu).

**For additional information on the College of Education and Human Development, please visit our website <https://cehd.gmu.edu/students/>.**