

George Mason University
College of Education and Human Development
Ph. D. in Education and Human Development

EDRS 827 - 001: Introduction to Measurement and Survey Development (3 Credits)
Spring 2022

Course Time: Wednesday 4:30- 7:10 PM
Course Location: Thompson Hall L014 (Fairfax Campus)

Instructor: Marvin Powell, Ph. D.
Office: West Building Room 2105 Phone number: 703-993-1723
Office Hours: by appointment (please email).
Email address: mpowell11@gmu.edu

Prerequisite: EDRS 811^{B-} or 811^{XS}.

^{B-} Requires minimum grade of B-.

^{XS} Requires minimum grade of XS.

University Catalog Course Description: Develops knowledge and skills related to measurement and survey development and use in research for education, psychology, and related fields.

Course Overview: EDRS 827 introduces students to the classical measurement theory, survey and scale item development, and provides students with hands-on applications. Students require a working knowledge of statistical concepts so that we may determine the degree to which our measurement tools are meaningful (by conducting Exploratory Factor Analysis, Generalizability Theory and Item Response Theory). EDRS 827 provides students with the requisite skills to develop, analyze, and interpret instruments used in educational research. Students will learn through a combination of reading assignments, hands-on experience in developing a measurement tool and using data analysis procedures to assess measurement validity.

Course Delivery Method: Lectures will be used to present quantitative and factual information. Seminar discussions will occasionally be used to clarify and extend knowledge presented in assigned readings. In-class and out-of-class homework, readings, and exercises will be assigned each week and used to clarify lectures or prepare for discussion. **Questions are encouraged.**

Learning Objectives: This course is a one-semester measurement course design to expand students' understanding of organizing, analyzing, and interpreting educational measurement, it is expected that you will be able to:

- a) Evaluate and apply appropriate standards and use of educational and psychological testing as they relate to test construction, fairness in testing, reporting, and use of test scores
- b) Employ test construction practices that include item-writing for various types of assessment procedures;
- c) Demonstrate a conceptual understanding of reliability and validity of educational and psychological measures;
- d) Define and classify procedures used to provide validity evidence for educational and psychological tests
- e) Conduct exploratory factor analysis as a method of assessing validity of a measure;
- f) Read, understand, and interpret scientific articles related to development and validation of educational and psychological measurements

Required Materials:

- Crocker, L., & Algina, J. (2006). *Introduction to classical & modern test theory*. Thompson-Wadsworth.
- DeVellis, R. F. (2017). *Scale development: Theory and applications* (4th Ed.). Sage.

Recommended Resource:

- American Psychological Association (2019). *Publication manual of the American Psychological Association* (7th Ed.). APA.
- American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (2014). *Standards for educational and psychological testing*. Author.
- Cardinet, J., Johnson, S., & Pini, G. (2010). *Applying generalizability theory using EduG: Quantitative methodology series*. Routledge.
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method* (4th Ed.). John Wiley & Sons, Inc.
- Shavelson, R. J., & Webb, N. M. (1991). *Generalizability theory: A primer*. Sage.

Course Performance Evaluation:

Homework Assignments (20%): Assignments and exercises will be given on a regular basis and will include (a) Questions from readings, (b) Homework Problems, and/or (c) Data Analysis Assignment. These assignments will be used as a record of attendance and participation in class discussions.

Article Reviews (20%): You will review (as though you were peer reviewing) **two** empirically-based articles (will be provided) and write a 1-2 page **critical** review of the article. Your review should address the nature of the study, literature reviewed, methods (appropriateness), hypotheses, data, or conclusions.

Individual Presentation (15%): You will select a topic from a list of survey issues. You will conduct a 15-minute presentation on this topic during class. Topics will be provided by instructor.

Test Construction Project (25%): You will be assigned to groups. Groups will choose content from the following areas:

- A. Survey of Thoughts, Feelings, Opinions
- B. Educational Content Assessment
- C. Psychological Domain Functioning

Each group will then follow appropriate procedures for constructing an assessment, collect data from a sample of individuals, and critically analyze the instrument created to determine the assessment's properties, strengths and weaknesses. The purpose of this project is to focus and integrate the concepts covered in class. You will submit a document that simulates a complete manuscript for publication.

Group Presentation (20%): The results of the project will be presented in class.

Other Requirements:

Class Readings: The readings for this course come from the required textbook as well as journals and other books which provide insight or examples of the topic. Readings, when possible, will be made available to you for download from the Blackboard course website.

Class Attendance & Participation: Students are expected to come to class on time, complete assignments, and participate in class discussions.

Grading Policies:

Grades will be assigned based on the following:

A+	98-100%	B+	88-89%	C	70-79%
A	93-97%	B	83-87%	F	below 70%
A-	90-92%	B-	80-82%		

Final grades are based in the assessments described above. “Extra credit” is not available.

Late Assignments: *As a general rule, late assignments will not be accepted.* If you believe you have EXCEPTIONAL circumstances and wish to negotiate to have extra time to complete course work, you must discuss this with me before the day the assignment is due. (Negotiating means that you will be sacrificing a portion, perhaps substantial, of your grade for extra time).

Professional Dispositions: Students are expected to exhibit professional behaviors and dispositions at all times. See <https://cehd.gmu.edu/students/policies-procedures/>

Tentative Course Schedule

Date	Class	Topic	Reading	Due
Intro to Measurement				
1/26	1	Course Overview Foundation of Educational Measurement		
2/02	2	Testing and Assessment Sampling problems Basic/Essential Statistical Concepts	C&A pp. v – 65 & Ch. 1-3	
2/09	3	Sampling problems Basic/Essential Statistical Concepts Legal and Ethical Considerations	C&A pp. v – 65 & Ch. 1-3 Standards...	
2/16	4	Classical Test Theory and Reliability	Allen & Yen Ch. 3 C&A Ch. 6 & 7 RFD Ch. 3 Henson (2001) Streiner (2003)	
2/23	5	Validity	C&A Ch. 10 RFD Ch. 4 Cronbach & Meehl (1955) Messick (1995)	
Survey Development				
3/02	6	Planning and Sampling	Pdf on Bb	
3/09	7	Test Development & Construction Crafting good questions	C&A Ch. 4 & 5 RFD Ch. 5	
3/16	8	Spring Break		
3/23	9	Implementation procedures and multiple survey modes	Pdf on Bb	
3/30	10	Delivery, sponsorship and other survey issues	Pdf on Bb	
Analyzing Survey Data				
4/06	11	Generalizability Theory	C&A Ch. 8	
4/13	12	Exploratory Factor Analysis	C&A Ch. 13 RFD Ch. 6	
4/20	13	Exploratory Factor Analysis	C&A Ch. 13 RFD Ch. 6	
4/27	14	Item Analysis & Item Response Theory	C&A Ch. 14 & 15 RFD Ch. 7	
5/04	15	Research Project Presentations		

Note: 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 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 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 follow the university policy stating that all sound emitting devices shall be silenced during class unless otherwise authorized by the instructor.

Campus Resources

- Support for submission of assignments to VIA should be directed to 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.

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