University of Florida
College of Medicine
Department of Health Outcomes and Biomedical Informatics

GMS 6822: *Measuring and Analyzing Health Outcomes*
Spring 2026

Instructors: Yi Guo, PhD
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Credits: 3 credits
Location: MALA 7126
Time: Fridays 9:35AM
Office hours: By appointment

Course Description

This course will introduce measurement methods currently used in population health sciences and clinical research. Students will gain basic knowledge of health outcomes measures and practical skills in selecting appropriate measures for their own research. This course covers the topics of classical test theory and modern test theory, and their applications to population health sciences and clinical research. The principles of psychometrics will be introduced, such as reliability, validity, and responsiveness. Data types corresponding to measurements will be emphasized in the context of statistical analysis. The assessment tools will be compared, especially the generic and disease-specific instruments. Clinical meanings and interpretations for measurement results will be illustrated. Finally, students will have the opportunity to apply content learned during the course to populations across the life course (from childhood to older adulthood).

Course Objectives

By the end of the semester, students will understand the basic concepts of health outcomes measurement:

1. Overview of health outcomes measurement, conceptual framework of measurement, and basic measurement theory;
2. Type of measurement tools and appropriate selection for use;
3. Scale design using qualitative methods (focus group and cognitive debriefing);
4. Psychometric methods for instrument assessment (reliability, validity, and responsiveness);
5. Instrument development and refinement;
6. Cross-cultural translation and validation;
7. Issues of data analysis;
8. Issues of instrument administration;

9. Practical design issues (data collection methods, maximizing and calculating response rates, estimating costs, and reporting issues);
10. Special considerations in selecting instruments for populations at each stage of the life course.

Textbook

David L. Streiner and Geoffrey R. Norman. *Health Measurement Scales: A Practical Guide to Their Development and Use*. 5th edition.

Evaluation and Grading

Grades will be based on completion of:

1) Reaction comments and quality (20%)
2) Project presentation (30%)
3) Final research protocol (30%)
4) Class participation (20%)

Reaction comments:

Students must read the assigned readings prior to attending each class session, and submit 1 single-spaced page (12 points in size) of reactions, thoughts, comments and/or questions on the main issues raised in the readings. Weekly assignments are to be submitted on the Canvas course website by 8:00 a.m. on the day of each class session. Students need to focus on 1) conceptual and methodological implications of the readings, 2) what has been learned from each reading and its implications to student's area of research, and 3) what is not clear and the need for further discussion.

Research protocol and project presentation:

Each student will prepare a research protocol based on his/her research interests and address the following issues: 1) a description of research questions (including brief explanation of importance, description of target population and specific aims of study, review of existing instruments that might address the question), 2) description of an instrument (including conceptual framework, measurement module [new instrument, adopted instruments, or combination of different instruments], format, mode of administration, etc) that is needed to address the research questions, 3) discussion of the choices made during instrument development, and 4) description of a strategy with appropriate justification for evaluating relevant measurement properties (including reliability, validity, responsiveness, etc).

Each student is asked to present the research protocol for 20 minutes (including 5 minutes Q&A) during our last class session. A final research protocol (6 single-spaced pages and 12 points in size) is due during finals week. The content of the research protocol needs to include the following sections: 1) background, 2) conceptual framework, 3) study population and data collection, 4) instrument development process, and 5) instrument validation methods.

Class discussion:
Each class session will start with a discussion of the assigned reading. Each student should come prepared to discuss insights made that they wrote about in their reaction papers. All students must participate in each class discussion.

Grades will be assigned as follows:

Letter Grade	*Grade Percentage*
A	95-100
A-	90-94
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	63-66
D-	60-62
E	59 and below

Tentative Dates and Topics

Date	***Topic***
Week 1 (01/16)	Overview of health outcomes measurement
Week 2 (01/23)	Measurement theory and type of health outcomes instrument
Week 3 (01/30)	Instrument development (1) – focus group and cognitive debriefing
Week 4 (02/06)	Instrument development (2) – design at item and scale levels
Week 5 (02/13)	Measurement methods (1) – classical test theory (Part 1)
Week 6 (02/20)	Measurement methods (2) – classical test theory (Part 2) and response shift
Week 7 (02/27)	Generalizability theory
Week 8 (03/06)	Factors influencing patient-reported outcomes measurement
Week 9 (03/13)	Cross-cultural instrument translation and validation ****Specific Aims Page Due****
Week 10 (03/20)	Spring Break
Week 10 (03/27)	Item response theory (guest lecture)
Week 11 (04/03)	Introduction to measurement in life course research (guest lecture)
Week 12 (04/10)	Application in clinical/health services research and future direction
Week 13 (04/17)	Student presentations ****Final Research Protocol Due: April 29, 11:59pm****

Academic policies and resources

https://go.ufl.edu/syllabuspolicies