

RMS 4921: Psychometric Theory

Fall 2017 Syllabus

Instructor: Denis Dumas (denis.dumas@du.edu)

Office: KRH 233; **Phone:** 303-871-4710

Office hours: Wednesdays 1:00-4:00pm, Thursdays 1:00-5:30pm (email to reserve a slot)

Also available by appointment

Mailbox: KRH 201A (or on office door)

Class Meetings:

Section 1: Wednesdays 4:00-6:30pm

Section 2: Thursdays 7-9:20pm

Classroom: Ruffatto Hall 305

Graduate Teaching Assistant:

Name: Jinjin Huang

Email: jinjin.huang@du.edu

Prerequisite: Graduate Standing, introductory statistics class such as RMS 4910. No previous psychometric experience is necessary.

Purpose and Goals: This course is about the theory and principles of test reliability and validity, topics in test theory, and statistical procedures applicable to psychometric methods. Goals of this course are (1) to understand and be able to apply concepts from psychometric theory, primarily classical test theory, to measures, (2) to understand and apply methods of measure development, and (3) to develop the capacity for critical judgment of the adequacy of measures. Data analysis using computer software is required. This course is organized in a lecture-discussion format and participation in discussion is expected. This course is *not* designed to make you a skilled psychometrist (test administrator) nor an accomplished psychometrician (test constructor) but rather it is designed to facilitate your introduction to psychometrics and to provide a foundation for future research and practice. The conceptual (theory and statistics) will be balanced with the applied (data analysis and test review).

Materials

Texts

This course does not explicitly require you to purchase any texts. However, it does require you to be curious about and generally engaged with the literature. Here are some non-required texts that you might want to consider consulting.

1. AERA, APA, & NCME, (2014). *Standards for Educational and Psychological Testing*. AERA press: Washington, DC.
2. Carlson, J. F., Geisinger, K. F., & Jonson, J. L. (Eds.). (2017). *The Twentieth Mental Measurements Yearbook*. Buros Center for Testing: Lincoln, NE.
3. Crocker, L., & Algina, J. (1986). *Introduction to Classical and Modern Test Theory*. Holt, Rinehart and Winston: Austin, TX.

4. Furr, R. M., & Bacharach, V. R. (2013). *Psychometrics: An Introduction*. Sage: Thousand Oaks, CA.

Computer Programs

Officially, I am entirely program agnostic. If there is a particular program with which you are comfortable and to which you have access, great. However, I will always demonstrate all procedures we learn in whatever program that is available on campus that makes the analysis most simple. Some programs are just better for certain types of models. For this course, we will do some basic work in Excel but mainly we will focus on SPSS or SAS: JMP.

Calculator

You may need a calculator that is capable of calculating square roots for the quizzes. Students are encouraged to bring calculators to class each day. *I will not provide calculators. No cell-phone calculators please!*

COURSE GRADES

Your attendance, quizzes, measure critique, and take-home exam will be combined according to the percentages shown. Final grades will then be assigned based on the scale below.

Factors Effecting Course Grade

Attendance/Participation	20%
Quizzes	10%
Measure critique	30%
Take-home Exam	40%

Grade Categories

90% and above	A
80%-89.99%	B
70%-79.99%	C
55% - 69.99%	D
54.99% and below	F

Grades will not be changed unless a computational error has been made. No grades will be dropped. There will be no extra credit. Grades of "Incomplete" will not be given unless the student can demonstrate that near catastrophic events have led to a cause of extreme hardship.

INFORMATION ON ASSESSMENTS

Attendance/participation. This class will feature a number of in-class analyses. Some will be conducted by hand, with a calculator, or using another program. I think it's important for each student to be present in both body and mind for the class meetings, so attendance/participation is worth 20% of the grade.

Quizzes. Quizzes in this course will be brief and take place in the very beginning of class. At only 10% of the final grade, the quizzes are designed to help you identify areas in which you need study, not to make/break anyone's grade. Quizzes are zeros if you miss them.

Critique. For this assignment, you must find and read a measurement article to critique. You may need to read multiple articles if a test has been validated across multiple studies. Inspiration for these critiques may be found in the *Mental Measurement Yearbook*, which reviews a number of tests. Published articles must be peer-reviewed and published in a respected journal such as: *Psychological Assessment*, *Journal of Psychoeducational Assessment*, or *Journal of Educational Psychology*.

Critiques should be between 3 and 5 double spaced pages and briefly review the published measure on the functioning of its items, reliability, dimensionality, validity, and fairness. All topics are fair game, depending on the strengths/weaknesses of the work you choose to critique. Critiques are not accepted late.

Take-home final exam. The final in this course will be completed outside of class, and will require usage of statistical software. Essentially, students will be required to demonstrate all procedures covered in this course on the final. Class notes, textbooks, or other reference material may be utilized for the midterm, but the midterm must be completed *independently*, without the aid of your classmates. Final exams are not accepted late.

RMS 4921 Class Schedule: Fall 2017

Class Number	Class Day	Topic	Assignment
1	September 13 th or 14 th	Introduction	
2	September 20 th or 21 st	Classical Test Theory	
3	September 27 th or 28 th	Reliability	Quiz 1
4	October 4 th or 5 th	Intro to item-response theory	
5	October 4 th or 5 th	Item analysis continued	
6	October 11 th or 12 th	Scales, norms, and cut-offs	Quiz 2
7	October 18 th or 19 th	Dimensionality and exploratory factor analysis	
8	October 25 th or 26 th	EFA continued	
9	November 1 st or 2 nd	Validity	Quiz 3
10	November 8 th or 9 th	Fairness	Take-home final posted
11	November 15 th or 16 th	Catch up/Special topics	Measure critique due
--	November 21st		Take-home final due by midnight