EDF 7439 — Item Response Theory
Fall - 2010

Time:
Thursdays 9:35 – 12:35 pm
Room: NRN 1331

Professor: Dr. Walter Leite
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Office Hours:
Mondays, 3-4 pm, Tuesdays 1-2 pm,
Wednesdays 1-2 pm.
Or by appointment

Objectives

The objective of the course is to provide training in the theory and application of item response theory (IRT) as it pertains to educational and psychological measurement. By completion of the course, students are expected to have a firm grasp of: (1) the advantages of IRT compared to classical test theory, (2) the different IRT models that can be used and their properties, and (3) common applications of IRT.

The class website is http://online.education.ufl.edu

The class website is the repository for the class readings, assignments and handouts. I will bring handouts to every class meeting but will post the course handouts at the class website prior to the start of each class. I will also post assignments and data sets on the website, and assignments should be submitted through the website unless different instructions are given for a specific assignment.

Required book

De Ayala, R. J. (2009). The theory and practice of item response theory. Guilford press.

Other required readings

These readings will be available as PDF files in the course website:

Kamata, A. & Bauer, D. J. (2008). A Note on the Relation between Factor Analytic and Item Response Theory Models. *Structural Equation Modeling*, 15, 136–153.

Thissen, D. & Mislevy, R. J. (2000). Chapter 5: Testing Algorithms. In: H. Wainer (ed.). *Computerized adaptive testing: A primer.* Mahwah, NJ: Lawrence Erlbaum.

Von Davier, M. (2005). A General Diagnostic Model Applied to Language Testing Data. ETS Research Report RR-05-16.

Fox, J. (2007). Multilevel IRT Modeling in Practice with the Package mlirt. Journal of Statistical Software, 20, 1-16.

Course Requirements

1. Homework – 20 %
2. Quizzes – 20 %
3. Research critique – 10%
4. Final project – 30 %
5. Presentation of final project - 10 %
6. Participation in online forums – 10%

Description of Requirements

Homework Questions: There will be homework exercises assigned regularly. The number of homework exercises will depend on the pace of the class. The homework questions can be completed individually or with a partner.

Quizzes: There will be quizzes about the topics covered on the previous class. These quizzes will not be scheduled in advance.

Research Critique: The students will submit a detailed methodological analysis of

an academic paper that uses Item Response Theory.

Final Paper: The students will submit a final individual paper, which will take the format of a conference proposal according to the call for proposals for the Annual Meeting of the National Council for Measurement in Education (MCME). There are two types of paper: Methodological and applied. Students in Research and Evaluation Methodology must choose a methodological paper. Students in other areas may choose either one. The methodological paper does not need to contain results. The applied paper should contain at least preliminary results. For the applied paper, design, conduct, and report an application of one of the IRT models. With two exceptions the data used in this project cannot come from a conference paper, dissertation, thesis, unpublished, or published study. The exceptions are for data from a study in which (a) IRT was not used or (b) IRT was used but you propose a radically different model than the one used in the document. The paper should be in either APA style or in a style used in journals in your field.

Presentation of Final Paper: The students will present their final papers at the last day of class using the format of paper sessions presented at the Annual Meeting of the NCME.

Online Discussion Forums

There will be two discussion forums: One about the research critiques and another about the final papers. Each student is expected to read at least one research critique and one final paper of a classmate and post a reaction to each in the respective discussion forums. Students have one week after these assignments are due to post a reaction on the online discussion forums.

Class Attendance

As a matter of mutual courtesy, please let the instructor know when you're going to be late, when you're going to miss class, or if you need to leave early. Please try to do any of these as little as possible. Students are expected to be present for all classes, since much material will be covered only once in class. Students who have extraordinary circumstances preventing attendance, or who must leave early, should explain these circumstances to the course instructor prior to the scheduled class, or as soon as possible thereafter. The instructor will then make an effort to accommodate reasonable requests. Attendance will not be checked or graded, but

you are responsible for the content of all classes, including issues raised in the spontaneous class discussions. If you must miss a class, please request notes from your classmates.

Make-up Exams or Other Work:

Extra credit - No planned opportunities for extra credit exist in this course.

General policy on missed work - It is expected that no students will miss any assignments or in-class tests/exams. No make-ups will be possible. Assignments not turned in by their due date will not be considered for grading, and will be assigned a failing grade of zero (0). In unusual circumstances, unavoidable absences resulting in missed work may be excused by the instructor. Excuse of absence can only be achieved in private consultation with the instructor, and will usually require written supportive documentation (e.g., doctor's certificate). When in doubt, check with the instructor, preferably IN ADVANCE.

Academic dishonesty

For University's honesty policy regarding cheating and use of copyrighted materials, see: http://www.dso.ufl.edu/judicial/procedures/honestybrochure.php
Written assignments will be checked for plagiarism against published works, other papers submitted by classmates at the current and previous semesters and internet pages using Turnitin, which is UF's plagiarism detection software. It is expected that submitted work will solely reflect the student's own efforts.

Course Grades

Final grades will be assigned based on the scale below:

Overall course percent	*grade*
93.0% - 100%	A
90.0% - 92.9%	A-
87.0% - 89.9%	B+
83.0% - 86.9%	B
80.0% - 82.9%	B-
77.0% - 79.9%	C+
73.0% - 76.9%	C
70.0% - 72.9%	C-
67.0% - 69.9%	D+

63.0% - 66.9%	D
60.0% - 62.9%	D-
59.9% or less	E

Unless a computational error has been made, grades will not be changed after the end of the semester.

Calendar of topics

Following are the topics to be covered during the semester and the readings that students are expected to be doing, whether or not the material is explicitly addressed on the date indicated. I may include additional readings at any point of the semester.

Week 1. Introduction to Measurement

Week 2. The One-Parameter Model

Week 3. Joint Maximum Likelihood Parameter Estimation

Week 4. Marginal Maximum Likelihood Parameter Estimation

Week 5. The Two-Parameter Model

Week 6. The Three-Parameter Model

Week 7. Rasch Models for Ordered Polytomous Data

Week 8. Non-Rasch Models for Ordered Polytomous Data

Week 9. Models for Nominal Polytomous Data

Week 10. Models for Multidimensional Data

Week 11. Connections between IRT, Confirmatory Factor Analysis and Hierarchical Linear Modeling

Week 12. Cognitive diagnosis models

Week 13. Computerized Adaptive Testing

Week 14. Linking and Equating

Week 15. Differential Item Functioning

Week 16. Presentation of final projects

Accommodations for Students with Disabilities

If you require classroom accommodation because of a disability, you must first register with the Dean of Students Office (http://oss.ufl.edu/). The Dean of Students Office will provide documentation to you, which you then give to the instructor when requesting accommodation. The College is committed to providing reasonable accommodations to assist students in their coursework.

Counseling and Student Health

Students may occasionally have personal issues that arise in the course of pursuing higher education or that may interfere with their academic performance. If you find yourself facing problems affecting your coursework, you are encouraged to talk with an instructor and to seek confidential assistance at the University of Florida Counseling Center, 352-392-1575, or Student Mental Health Services, 352-392-1171. Visit their web sites for more information:
http://www.counsel.ufl.edu/ or
http://www.health.ufl.edu/shcc/smhs/index.htm#urgent

The Student Health Care Center at Shands is a satellite clinic of the main Student Health Care Center located on Fletcher Drive on campus. Student Health at Shands offers a variety of clinical services, including primary care, women's health care, immunizations, mental health care, and pharmacy services. The clinic is located on the second floor of the Dental Tower in the Health Science Center. For more information, contact the clinic at 392-0627 or check out the web site at: www.health.ufl.edu/shcc

Crisis intervention is always available 24/7 from:

Alachua County Crisis Center: (352) 264-6789.