Course Syllabus
16:300:687
Item Response Theory
Fall 2012

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Office hours:	Monday 3:00 – 4:00 PM, or by appointment

Prerequisites:	Statistical Methods I & II (Quantitative Methods I), Psychometric Theory I, or consent of the instructor
Time:	Monday, 4:50 – 7:30 PM
Place:	Room 208, Graduate School of Education
Texts:	de Ayala, R. J. (2009). *The theory and practice of item response theory*. New York: Guilford. Embretson, S. E., & Reise, S. P. (2000). *Item response theory for psychologists.* Mahwah, NJ: Erlbaum.

Course Description

This course in an introduction to the principles and applications of item response theory (IRT), and encompasses a class of probabilistic measurement models commonly used in the educational and organizational settings. The course covers the foundations and assumptions underlying IRT, comparison of various IRT models, application of IRT to practical testing situations, and implementations of IRT using packaged (e.g., BILOG) and generic (e.g., MCMC) computer programs.

Course Requirements

1). **Exam**: There will be one take-home exam worth 40% of the final grade. The exam will cover materials from the class lectures, homework and reading assignments.
2). **Homework assignments:** Homework assignments (worth 30% of the final grade) will be given throughout the semester. The problems are designed to help you further understand and apply the theoretical concepts covered in class.
3). **Project:** An individual or group paper illustrating the principles and applications of IRT will be required. Projects can be selected from a wide range of topics, and can vary from computer simulations to analyses of your own or existing data sets. A one-page project proposal must be submitted around the spring recess. The project presentation and submission is on the last day of the class. As a whole, the project is worth 30% of the final grade.

Final letter grade will be assigned as follows:

Final Score	Letter Grade
90% and Above	A
80%-89%	B+
75%-79%	B
65%-74%	C+
60%-64%	C
Below 60%	F

Class Schedule

The following class schedule is subject to change if necessary.

*Note: For the reading assignments **D** refers to de Ayala, R. J. (2009), whereas **E** refers to Embretson, S. E. & Reise, S. P. (2000), and **A** refers to supplementary articles.*

Week	Date	Topic	Reading Assignment
1	9/10	Background	D1,2a, E2,3,4a
2	9/17	IRT Models	D5a,6a,8a,10a, E4b,5
3	9/24	Metric of Scale	D5b,6b, E6
4	10/1	Ability Parameter Estimation: Scoring	D4a,Appendix A, E7
5	10/8	Using BILOG	
6	10/15	Item Parameter Estimation: Calibration	D3,4b,Appendix B, E8
7	10/22	Assessing Model Fit	D5b,6b, E9
8	10/29	Item and Test Information Functions	D5b,6b, E7,Appendix
9	11/5	Test Construction/Test Equating	D11
10	11/12	**Midterm Exam (Take Home)**	
11	11/19	Differential Item Functioning	D12, E10a, A1
12	11/26	Computerized Adaptive Testing	D-Appendix D, E10b, A2
13	12/3	MCMC and IRT Model Extensions	A3
14	12/10	Cognitive Diagnosis Modeling	A4
15	12/17	**Project Presentation and Submission**	

ACADEMIC INTEGRITY POLICY

Please comply with standards of academic integrity in this course. For the homework assignments, you are allowed to work with your classmates; however, submitted works should be of your own. For the exams, you are not allowed to work with or request help from anyone. The consequence for violating policies of academic integrity and other elements of the student code of conduct are serious and can have a tremendous negative impact on your academic progress and future career. Please familiarize yourself with the university policy on academic integrity: http://studentconduct.rutgers.edu/academic-integrity.

Please refer to the Policy on Academic Integrity for Undergraduate and Graduate Students at http://academicintegrity.rutgers.edu.

The University Code of Student Conduct can be accessed at: http://studentconduct.rutgers.edu/university-code-of-student-conduct.

Related regulations may also be found in the Rutgers Graduate School of Education Catalog.

Clear evidence of violation of academic integrity policy may result in a grade of *F* for the assignment AND the course.