

**Spring 2015**  
**Psychometric Theory I Online**  
**15:291:515:90**  
3 Credits

Instructor Name: Youngsuk Suh	Email: youngsuk.suh@gse.rutgers.edu
Phone Number: 848-932-0829	10 Seminar Pl Rm 323
Lecture: Tuesdays	Exercise activity: Thursdays
Office Hours: Tuesday 2:30 - 3:30 PM or by appointment	Prerequisites or other limitations: <i>Statistical Methods in Education I</i> (15:291:531) or the equivalent
Mode of Instruction: <input type="checkbox"/> Lecture <input type="checkbox"/> Seminar <input type="checkbox"/> Hybrid <input checked="" type="checkbox"/> Online <input type="checkbox"/> Other	Permission required: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Directions about where to get permission numbers: Contact the instructor.

**Learning Goals**

Program goals: The master's of education degree in Educational Statistics, Measurement and Evaluation aims to provide students training in basic and intermediate statistical, measurement, and evaluation methods. It serves as a preparation for students interested in working in research institutions, and pursuing Ph.D. studies in educational statistics and measurement or a related field. The Ph.D.in Statistics and Measurement within the Learning, Cognition, Instruction, and Development concentration prepares students to become statisticians and psychometricians with broad expertise in applied statistics, measurement theory, educational assessment and statistical analysis. An important feature of the program is early exposure to research and active learning through a variety of course offerings.

Course goals:

This course is designed to provide an overview of basic but important topics and issues in educational and psychological testing and measurement. The course aims to offer fundamental knowledge and techniques required to analyze educational and psychological tests from the perspective of psychometrics.

After successfully completing this class students should achieve the following goals.

Goal 1. Understand the fundamental concepts, methods, and principles of educational and psychological measurement. Specific objectives are as follows:

- a. Understand the purposes and methods of score transformation, conduct the score transformation, and interpret the results
- b. Be able to obtain and interpret reliability and validity related evidence
- c. Understand the general procedures for test construction and item writing

- d. Be able to conduct an item/test analysis from the classical test theory perspective
- e. Understand the general principles of the item response theory and its applications

Goal 2. Be more measurement literate. That is, be able to read, interpret, and critically evaluate measurement methodology, reported outcomes, and subsequent interpretations, as found in educational or behavioral research journals.

### **Course Catalog Description**

Psychological and statistical principles underlying test design, analysis, and interpretation with emphasis on classical psychometric theory; analysis of reliability and validity and their estimation; the development, analysis, and use of both norm-referenced and criterion-referenced tests; and introduction to scaling techniques.

### **Class Materials/ Textbooks**

#### Required texts:

Allen, M. J. & Yen, W. M. (2002). Introduction to Measurement Theory. Prospect Heights, IL: Waveland Press.

#### Recommended:

Crocker, L. & Algina, J. (1986). Introduction to Classical & Modern Test Theory.  
Wilson, M. (2005). Constructing Measures: An Item Response Modeling Approach.  
Thorndike, R. M. (2005). Measurement and Evaluation in Psychology and Education. (7th ed.).

### **Other Description of Course Methods**

Basic statistical knowledge is required throughout the course because some issues in the field are necessarily technical.

Calculator: A calculator that performs basic operations is necessary for homework assignments, exercises, and exams.

Dropbox: A **Basket** labeled **Question Box** will be created every week for you to drop content-related questions. Your questions will be answered on a daily basis (**weekdays during the daytime**). Therefore, please make sure you are familiar with the function, **Dropbox**.

## Grading Policy

Final letter grade will be assigned as follows:

<b>Final Score</b>	<b>Letter Grade</b>
<b>90% and Above</b>	<b>A</b>
<b>80%-89.99%</b>	<b>B+</b>
<b>75%-79.99%</b>	<b>B</b>
<b>65%-74.99%</b>	<b>C+</b>
<b>60%-64.99%</b>	<b>C</b>
<b>55%-59.99%</b>	<b>D</b>
<b>Below 55%</b>	<b>F</b>

## Assignments and Requirements

1. **Exams:** There will be two online exams, midterm and final, which are worth 30% and 30% of the final grade, respectively.
2. **Homework assignments:** Approximately 4 homework assignments, worth 30% of the final grade, will be given online during the semester. You have a whole week to work on a homework assignment. No late homework assignment is acceptable.
3. **Final Report:** A report/critique from a self-selected journal paper that applies the theories and techniques covered in the course is worth 10% of the final grade. The final report/critique is due on May 1st. More detailed information about the final report will be distributed.
4. **Online exercise activities:** Approximately 8 exercises will be given throughout the semester, but will not be graded. The exercises are designed to help you understand the contents covered by lectures. Therefore each exercise will be posted on Thursdays along with the answers. Discussion will be expected through the Dropbox function.
5. **Extra handouts or readings:** Depending on your questions and feedback, extra handouts or reading materials will be posted in addition to the regular lecture notes. These materials are designed to explain difficult concepts covered in the lecture notes or help you better understand the topic for each week.
6. **Reading assignments:** Assigned readings must be completed prior to each lecture.
7. **Participation:** Your participation is expected throughout the semester.

### **Email & eCollege Access:**

Efficient communication is the key to evaluate how successful an online course is. In this course, emailing and eCollege are the two communication tools that we heavily rely on. To maximize the teaching and learning effects, you should check your emails account frequently and make sure you are able to receive information, download files, drop messages, do homework, and, take exams from our course web page. All information and activities are time sensitive. Late responses and requests will not be handled. For example, you will have a run of time to finish each homework assignment. However, you will not be able to access the homework assignment after its due date.

### **Academic Integrity Policy**

The Office of Student Conduct supervises issues related to violations of academic integrity (see <http://academicintegrity.rutgers.edu>). Please familiarize yourself with the university policy on academic integrity at [http://academicintegrity.rutgers.edu/files/documents/AI\\_Policy\\_2013.pdf](http://academicintegrity.rutgers.edu/files/documents/AI_Policy_2013.pdf)

### **Office of Disability Services**

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: <https://ods.rutgers.edu/students/documentation-guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: <https://ods.rutgers.edu/students/registration-form>.

## Course Schedule

The following class schedule is subject to change if necessary. Reading assignments must be completed each week.

<b>Week</b>	<b>Topics to be Covered</b>	<b>Readings</b>
Jan 20-Jan 24	Getting Started	
Jan 25-Jan 31	Introduction; Basic Statistical Concepts	Ch. 1 & 2
Feb 1-Feb 7	Transforming; Scaling; Equating	Ch. 7 & 8
Feb 8-Feb 14 Feb 10	Classical Test Theory *HW 1 assigned	Ch. 3
Feb 15-Feb 21 <b>Feb 16</b> Feb 17	Reliability * <b>HW 1 due</b> *HW 2 assigned	Ch. 4
Feb 22-Feb 28 <b>Feb 23</b>	Reliability; Preparation for Midterm * <b>HW 2 due</b>	Ch. 4
<b>Mar 7</b>	<b>Midterm Exam</b> (starts at 7pm)	
Mar 8-Mar 14	Validity I	Ch. 5
Mar 15-Mar 22	<b>Spring Break (No Class)</b>	
Mar 23-Mar 28	Validity II	Ch. 5
Mar 29-Apr 4 Mar 31	Test Construction; Item Writing *HW 3 assigned	Ch. 6, Handouts
Apr 5-Apr 11 <b>Apr 6</b> Apr 7	Item Analysis * <b>HW 3 due</b> *Final Project assigned	Ch. 6
Apr 12-Apr 18	Item Response Theory I	Ch. 11.5-11.6, Handouts
Apr 19-Apr 25  Apr 21	Item Response Theory II; Criterion-referenced Test vs. Norm-referenced Test *HW 4 assigned	Ch. 11.7-11.9 Ch. 10.5, Handouts
Apr 26-May 2 <b>Apr 27</b> <b>May 1</b>	Review; Preparation for Final Exam * <b>HW 4 due</b> * <b>Final Report Due</b>	
<b>May 9</b>	<b>Final Exam</b> (starts at 7pm)	