Psychometric Theory (PSY-509; formerly 602)
CRN: 27350; Spring, 2010

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                           Responses usually within 24 hours; unless a holiday
Office Hours: By appointment
Class Meetings: Tuesdays & Thursdays, 8:30 . 9:45 a.m.
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Course Description and Objectives:

This course will provide you with an overview of the concepts and issues central to an understanding of classical and modern test theory and construction. Topics for the course will include an overview of basic statistical concepts, scaling, test construction and scoring algorithms, item analysis, reliability and generalizability theory and application, validity, prediction and classification, analysis of test dimensionality including factor analysis, test refinement and revision, test bias, and item response theory.

The learning objectives of the course are designed to map onto the five dimensions of the Saint Louis University Experience:

- Scholarship and Knowledge: To demonstrate knowledge of the basic elements of modern test theory and development via both written assignments and the ability to respond to conceptual and applied content questions regarding various aspects of the test development and refinement process.
- Intellectual Inquiry and Communication: To be able to write scholarly and comprehensive test descriptions, methodological test construction proposals, and instrument development, evaluation, and refinement proposals; to communicate one's ideas in a clear, concise, and professional manner.
- Community Building: To discuss course materials in a helpful and collaborative manner.
- Leadership and Service: To assist others in learning the course material by participating in classroom discussion and problem solving sessions.
- Spirituality and Values: To demonstrate knowledge of test use and misuse.

Following completion of the course, you should be able to (1) critically evaluate psychological tests and (2) write an instrument development proposal.

Required Materials, Text, and Readings:

Crocker, L., & Algina J. (2006). *Introduction to Classical and Modern Test Theory*. Belmont CA: Wadsworth.

A scientific calculator (you must be able to take a square root and raise to powers). Graphing functions are not necessary.

Required readings are listed at the end of the syllabus. A set of the readings is available in the copy room should you wish to make a personal copy. Electronic copies are available on the shared drive as well as on Blackboard.

Attendance & Participation Policy:

Each of you will be asked to attend class on a regular basis and come to class prepared having read the requisite chapters/articles and completed the problem sets and reading guides (when applicable). You may complete the problem sets and reading guides in any manner (pen, pencil, electronic) that is convenient for you that I can readily see in class (i.e. if electronic, please bring your laptop/netbook to class). You are also welcome to use diagrams, charts, lists, etc. as long as your responses can be reasonably deciphered. It is recognized that you may not always be able to answer all of the questions or to answer them correctly; the purpose of the problem sets and reading guides is to challenge you, direct you, and provide you with an opportunity to gain practice and feedback without grading. Therefore, I will simply be recording whether you come to class prepared and have given good effort. Class preparation will constitute the preparation portion of your grade. You are responsible for obtaining information presented in class from a classmate if you are absent.

If you are unable to attend class, please notify me ahead of time if possible or at your earliest convenience. If you come to class late, please enter quietly. If you will be absent on a date on which a test is scheduled, please notify me as soon as possible. If you give me sufficient notice of your anticipated absence prior to the scheduled test period, I will make reasonable effort to accommodate your requests. However, *if you are absent* from a test and have not made prior arrangements with me, you are *unlikely* to receive a make-up test; such absences will be judged on a case by case basis only.

Written Assignments:

During the course of the semester, you will be asked to prepare three written assignments. A brief description is provided below. Detailed instruction on each assignment will be given out during the course of the semester.

Assignment #1· Test Construction. You will be asked to write a test construction proposal, methods section, complete with proposed items.

Assignment #2· Test Development/Refinement. You will be asked to write a pilot study proposal, methods section, for the collection of information on the test items, as well as preliminary assessment of a test$ reliability and validity.

Assignment #3· Exploratory and Confirmatory Factor Analysis. You will be asked to write a factor analytic study proposal, methods section, for the conduct of an exploratory and a confirmatory factor analysis as used for test development, refinement, and/or evaluative purposes.

All written assignments should be prepared according to APA guidelines (version 5), prepared

electronically in either Microsoft Word (doc or docx) or Word Perfect in Times New Roman 12 or Ariel 11 with 1 inch margins. All written assignments may be submitted either electronically or in hard copy. Each is due by 5:00 pm on the date indicated. Late written assignments will be penalized one letter grade each day late.

You are welcome to take advantage of the Writing Center ϕ services (a part of the Student Success Center); getting feedback benefits writers at all skill levels. The Center helps with writing projects, multimedia projects, and oral presentations. They offer one-on-one consultations that address everything from brainstorming and developing ideas to crafting strong sentences and documenting sources. For more information, contact Sue Mendelsohn at 977-2930 or writing@slul.edu, or visit their website at http://www.slu.edu/x13305.xml.

Exams:

There will be two examinations . a midterm and a final. The final is partially cumulative. Prior to the midterm, you will be given a %practice+midterm to help you prepare. The %practice+midterm will not be graded; rather, its purpose is to help you and your peers prepare for the midterm. Exam questions will consist of problems and short-answer/essay-type questions. For the problems, make sure to show your work so that partial credit may be assigned. For the short-answer/essay-type questions, lists, charts, diagrams, etc are fine as long as your answers are complete and readable. You will be given the entire class period and may leave when you are finished. You will need to bring a writing instrument and scientific calculator. Response paper, scratch paper, and formula sheets (lists of requisite equations) will be provided; however, you must know what the formulas are for and how to use them.

Grades:

Grades will be determined on the basis of written assignments, midterm, final, and class preparation. The midterm and final are designed to be comprehensive and integrative. There will be no opportunity for %extra credit+to improve grades that have already been earned.

These elements will count as follows:

Exam 1	30%	A	90% +
Exam 2	30%	B+	87 . 89%
Written Assignment 1	10%	B	83 . 86
Written Assignment 2	10%	B-	80 -- 82
Written Assignment 3	10%	F	< 80
Problem Sets/Reading Guides	10%		

Accommodations & Assistance:

You are welcome to come and talk with me or call me, particularly if you are having any difficulties in this course or if you have any questions.

Anyone who feels that academic accommodations may be needed to meet the requirements of this course . as outlined in the syllabus . due to the presence of a disability, should contact Disability Services at 314-977-8885, send an email to Mark Pousson, poussonj@slu.edu, visit their office at Busch Student Center room 331, or visit their website at http://www.slu.edu/x24491.xml. Confidentiality will be observed in all inquiries.

Academic Integrity:

The University is a community of learning, whose effectiveness requires an environment of mutual trust and integrity. Academic integrity is violated by any dishonesty such as soliciting, receiving, or providing any unauthorized assistance in the completion of work submitted toward academic credit. While not all forms of academic dishonesty are listed here, examples include copying from another student, copying from a book or class notes during a closed-book exam, submitting materials authored by or revised by another person as one's own work, copying a passage or text directly from a published source without appropriately citing or recognizing that source, taking a test or doing an assignment or other academic work for another student, securing or supplying in advance a copy of an examination without the knowledge or consent of the instructor, or colluding with another student or students to engage in an act of academic dishonesty.

Any clear violation of academic integrity will be met with appropriate sanctions. Possible sanctions for violation of academic integrity may include, but are not limited to, assignment of a failing grade in the course, disciplinary probation, suspension, and dismissal from the University. Students should review the College of Arts and Sciences policy on Academic Honesty, which can be accessed on-line at http://www.slu.edu/colleges/AS.

Schedule of Assignments and Classes:

A tentative outline of topics and primary readings is provided on the next page. References follow. Please be aware that the outline may change in accordance with the need to spend more or less time on a given topic area. Any changes to the outline will be announced in class. You are responsible for keeping informed of changes.

Schedule of Classes

Week	Dates	Topic	Readings
1	Jan 12 Jan 14	Introduction; Statistics	C&A Ch 2; Schwartz
2	Jan 19 Jan 21	Scaling	C&A Ch 3
3	Jan 26 Jan 28	Test Construction/Scoring	C&A Ch 4; Vogt; Clark Comrey Part 1
4	Feb 2 Feb 4	Descriptive & Item Analysis	C&A Ch 5, 14 **Written Assignment #1 Due**
5	Feb 9 Feb 11	Reliability Theory	C&A Ch 6
6	Feb 16 Feb 18	Estimating Reliability	C&A Ch 7, Cortina
7	Feb 23 Feb 25	Validity	C&A Ch 10; Campbell; Haynes; Foster
8	March 2 March 4	Review **Midterm**	Practice Midterm Due
9	March 9 March 11	Spring Break Spring Break	
10	March 16 March 18	Prediction & Classification	C&A Ch 11; Hunsley **Written Assignment #2 Due**
11	March 23 March 25	Dimensionality/FA	C&A Ch 13; Comrey part 2 Reise ₋00; Floyd; Costello
12	March 30 April 1		
13	April 6 April 8	Refinement/Revision	Smith ₋95; Smith ₋00; Cicchetti
14	April 13 April 15	Test Bias	C&A Ch 12 **Written Assignment #3 Due**
15	April 20 April 22	Norms & Standards	C&A Ch 18, 19
16	April 27 April 29	Item Response Theory	C&A Ch 15; Reise ₋05; Fraley; Thissen
17	May 4	**Reading Day**	
	May 6	**Final Exam**	

References

Required Readings:

Campbell, D. P., & Fiske, D. W. (1959). Convergent and discriminant validity in the multitrait· multimethod matrix. *Psychological Bulletin, 56*, 81-105.

Cicchetti, D.V. (1994). Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychological Assessment, 6*, 282-290.

Clark, L.A., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment, 7*, 309-319.

Comrey, A. L. (1988). Factor-analytic methods of scale development in personality and clinical psychology. *Journal of Consulting and Clinical Psychology, 56*, 754-761.

Cortina, J.M. (1993). What is coefficient alpha? An examination of theory and applications. *Journal of Applied Psychology, 78*, 98-104.

Costello, A.B., & Osborne, J.W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical assessment, research and evaluation, 10*(7), 1-9.

Floyd, F.J., & Widaman, K. F.(1995). Factor analysis in the development and refinement of clinical assessment instruments. *Psychological Assessment, 7*, 286-299.

Foster, S. L., & Cone, J. D. (1995). Validity issues in clinical assessment. *Psychological Assessment, 7*, 248-260.

Fraley, R.C., Waller, N., & Brennan, K.A. (2000). An item response theory analysis of self-report measures of adult attachment. *Journal of Personality and Social Psychology*, 78, 350-365.

Haynes, S. N., Richard, D. C. S., & Kubany, E. S. (1995). Content validity in psychological assessment: A functional approach to concepts and methods. *Psychological Assessment, 7*, 238-247.

Hunsley, J., & Meyer, G.J. (2003). The incremental validity of psychological testing and assessment: Conceptual, methodological, and statistical issues. *Psychological Assessment, 15*, 446-455.

Reise, S., Ainsworth, A., & Haviland, M. (2005). Item response theory: Fundamentals, applications, and promise in psychological research. *Current Directions in Psychological Science*, *14,* 95-101.

Reise, S.P., Waller, N.G., & Comrey, A.L. (2000). Factor analysis and scale revision. *Psychological Assessment, 12*, 287-297.

Schwarz, N. (1999). Self-reports: How the questions shape the answers. *American Psychologist, 52*(2), 93-105.

Smith, G. T., & McCarthy, D. M. (1995). Methodological considerations in the refinement of clinical assessment instruments. *Psychological Assessment, 7*, 300-308.

Smith, G.T., McCarthy, D.M., & Anderson, K. (2000). On the sins of short form development. *Psychological Assessment, 12*, 102-111.

Thissen, D. & Steinberg, L. (1988). Data analysis using item response theory. *Psychological Bulletin, 104*, 385-395.

Vogt, D.S., King, D.W., & King, L.A. (2004). Focus groups in psychological assessment: Enhancing content validity by consulting members of the target population. *Psychological Assessment, 16*, 231-243.

Supplemental Readings:

Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin, 52*, 281-302.

Dawes, R. M., Faust, D., & Meehl, P. E. (1989). Clinical versus actuarial judgment. *Science, 243*, 1668-1674.

Grove, W. M., Zald, D. H., Lebow, B. S., Snitz, B. E., & Nelson, C. (2000). Clinical versus mechanical prediction: A meta-analysis. *Psychological Assessment, 12*, 19-30.

Grove, W. M., & Meehl, P. E. (1996). Comparative efficiency of informal (subjective, impressionistic) and formal (mechanical, algorithmic) prediction procedures: The clinical-statistical controversy. *Psychology, Public Policy, and Law, 2*(2), 293-323.

Henry, B., Moffitt, T. E., Caspi, A., Langley, J., & Silva, P. A. (1994). On the "Remembrance of Things Past": A longitudinal evaluation of the retrospective method. *Psychological Assessment, 6*, 92-101.

Miller, M. B. (1995). Coefficient alpha: A basic introduction from the perspectives of classical test theory and structural equation modeling. *Structural Equation Modeling, 2*(3), 255-273.

Westen, D., & Weinberger, J. (2004). When clinical description becomes statistical prediction. *American Psychologist,* 59, 595-613*.*