Subject Description Form

<table>
<tr><td>Subject Code</td><td>APSS 5041</td></tr>
<tr><td>Subject Title</td><td>Psychometric Theory and Scale Construction</td></tr>
<tr><td>Credit Value</td><td>3</td></tr>
<tr><td>Level</td><td>5</td></tr>
<tr><td>Pre-requisite / Co-requisite/ Exclusion</td><td>Recommended background knowledge:
Basic concepts of inferential statistics including linear regression, correlation and ANOVAs.</td></tr>
<tr><td>Minimum Pass Grade</td><td>D</td></tr>
<tr><td>Assessment Methods</td><td>
<table>
<tr><td>100% Continuous Assessment</td><td>Individual Assessment</td><td>Group Assessment</td></tr>
<tr><td>1. Assignment</td><td>30%</td><td>--</td></tr>
<tr><td>2. Group Presentation</td><td>--</td><td>35%</td></tr>
<tr><td>3. Participation/ Quizzes</td><td>35%</td><td>--</td></tr>
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Note:
• The grade is calculated according to the percentage assigned;
• The completion and submission of all component assignments are required for passing the subject; and
• Student must pass all component(s) if he/she is to pass the subject.
</td></tr>
<tr><td>Objectives</td><td>The subject aims to enable students:
1. To equip students with core measurement theories requiring for conducting validation studies on summative instruments.
2. To apply with reflection different qualitative and quantitative enquiry methods for collecting evidence on psychometric properties of instruments.
3. To critically evaluate the appropriateness and usefulness of common summative instruments used in psychological practices.</td></tr>
<tr><td>Intended Learning Outcomes</td><td>Upon completion of the subject, students will be able to:
a. Evaluate and reflect relevance and representativeness of test content against theoretical constructs based on which the instrument is developed.
b. Analyze characteristics of the instruments and evaluate the appropriateness of using specific method for gathering evidence on its reliability at an in-depth level.
c. Evaluate critically psychometric properties of summative instruments based on evidence generated from structural and substantive validity.</td></tr>
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<tr><td></td><td>d. Criticize strengths and weaknesses of validation studies of common summative instrument.
e. Synthesize psychometric theories and design appropriate validation study on psychometric properties of instruments.</td></tr>
<tr><td>Subject Synopsis/ Indicative Syllabus</td><td>1. Inferential statistics: explorative and confirmatory factor analyses
2. Criterion- and norm-referenced testing
3. Level of measurement and its relationship with psychometric analyses
4. Introduction to classical test theory
5. Concepts of reliability, i.e. coefficients of consistency and stability; different estimation methods: Cronbach's alpha, intraclass correlation, kappa
6. Classical model of validity - its history, Cronbach and Meehl, Anastasi, Nunnally – content, structural, substantive and construct
7. Messick's model of validation
8. Norming and scaling</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>The teaching methods used are lecture, tutorial and laboratory. Students will be given research papers, in-class exercise and quizzes to facilitate learning of concepts and knowledge on psychometrics. Students will conduct statistical analyses on data sets for learning of quantitative analyses. The group presentation and assignments are valuable venue for consolidating the knowledge and skills learnt in classes.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="5">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td></tr>
<tr><td>1. Assignment^</td><td>30 %</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>2. Group Presentation*</td><td>35 %</td><td></td><td>√</td><td>√</td><td>√</td><td></td></tr>
<tr><td>3. Participation/ Quizzes^</td><td>35%</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="5"></td></tr>
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*assessment is based on group effort
^assessment is based on individual effort

In the group presentation, the students are required to evaluate the methods used and results obtained from published or non-published studies on specific clinical/psychological instruments. In the assignment, the students will generate evidence of psychometric properties of an instrument based on a real data set and critically comment on strengths and weaknesses and suggest ways for further improving the instrument. The quizzes and participation in class activities enable the students to review the learnt materials in reliability and applied statistics. All assessment components are useful for consolidating the learning of the theories and concepts in class. The thinking and computation processes involved in the</td></tr>
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	assignments will enrich the students' skills on designing validation studies in the future.	
Student Study Effort Required	Class contact:	
	▪ Lectures and Tutorials	27 Hrs.
	▪ Class discussion	12 Hrs.
	Other student study effort:	
	▪ Preparation for tutorial and supervised practices	35 Hrs.
	▪ Private reading, self-reflection and writing task	30 Hrs.
	Total student study effort	104 Hrs.
Reading List and References	**<u>Essential</u>** Furr, R. M., & Bacharach, V. R. (2018). *Psychometrics: An Introduction* (3rd ed.). Thousand Oaks, CA: Sage Publications Ltd. Morgan, G. A., Leech, N. L., Gloeckner, G. W., & Barrett, K. C. (2014). *IBM SPSS for intermediate statistics: Use and interpretation* (5th ed.). New York: Routledge. Morgan, G. A., Barrett, K. C., Leech, N. L., & Gloeckner, G. W. (2019). *IBM SPSS for introductory statistics: Use and interpretation* (6th ed.). New York: Routledge. George, D., & Mallery, P. (2019). *IBM SPSS statistics 26 step by step: A simple guide and reference.* New York: Routledge. **<u>Supplementary</u>** Anastasi, A., & Urbina, S. (1997). *Psychological Testing* (7th ed.). Upper Saddle River, NJ: Simon & Schuster. Nunnally, J. C., Bernstein, I. H. (1994). *Psychometric Theory* (3rd ed.). New York: McGraw-Hill, Inc. Clark, L. A., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment*, *7*(3), 309-319. 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*(3), 238-247. Blanton, H., & Jaccard, J. (2006). Arbitrary metrics in psychology. *American Psychologist*, *61*(1), 27-41. Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin*, *52*, 281-302.	

	Messick, S. (1995). Validity of psychological assessment: Validation of inferences from persons' responses and performances as scientific inquiry into score meaning. *American Psychologist*, *50*(9), 741-749. Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods*, *4*(3), 272-299. Stevens, S. S. (1945). On the theory of scales of measurement. *Science*, *103*(2684), 677-680.