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>20%</td><td>--</td></tr>
<tr><td>2. Group Project</td><td>10%</td><td>40%</td></tr>
<tr><td>3. Quiz</td><td>30%</td><td>--</td></tr>
</table>
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 for understanding the conceptual and methodological issues behind psychological measurements.
2. To critically evaluate the appropriateness and usefulness of psychological instruments through conducting validation studies.
3. To apply different quantitative analysis methods for collecting evidence for the psychometric properties of measurements.</td></tr>
<tr><td>Intended Learning Outcomes</td><td>Upon completion of the subject, students will be able to:
a. Evaluate and reflect the relevance and representativeness of test content against theoretical constructs based on which the instrument is developed.
b. Analyze the characteristics of instruments and evaluate the appropriateness of using a specific method for gathering evidence on its reliability at an in-depth level.</td></tr>
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<tr><td></td><td>c. Evaluate critically the psychometric properties of instruments based on the evidence generated from different forms of validity.
d. Criticize the strengths and weaknesses of validation studies of common measurement tools.
e. Design an appropriate validation study and effectively interpret and present the validation results according to APA (American Psychological Association) format.</td></tr>
<tr><td>Subject Synopsis/ Indicative Syllabus</td><td>1. Level of measurement
2. Criterion- and norm-referenced testing
3. Norming, scaling, and scale transformation
4. Correlation and regression analyses
5. Introduction to classical test theory
6. Reliability
7. Validity
8. Exploratory and confirmatory factor analyses
9. Item response theory</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>20 %</td><td></td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>2. Group Project*^</td><td>50 %</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>3. Quiz^</td><td>30 %</td><td></td><td>√</td><td>√</td><td></td><td>√</td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="5"></td></tr>
</table>
*assessment is based on group effort
^assessment is based on individual effort

In the group project, students are required to conduct a quantitative research project and develop a reliable and valid test for measuring a specific psychological construct. Data collection is required to verify the psychometric properties of the test. In the assignment, 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 quiz enables the students to review the learnt materials in psychometric theory and applied statistics. All assessment components are useful for consolidating the</td></tr>
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	learning of the theories and concepts in class. The thinking and computation processes involved in the assignments will enrich the students' skills on designing validation studies in the future. Medium of Instruction and Assessment: English	
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	**Essential** Cohen, R. J., & Swerdlik, M. E. (2018). *Psychological testing and assessment: An introduction to tests and measurement* (9th ed.). New York, NY: McGraw Hill. Price, L. R. (2017). *Psychometric methods: Theory into practice*. The Guilford Press. Tenko Raykov, & Marcoulides, G. A. (2011). *Introduction to psychometric theory*. Routledge. Richard Michael Furr. (2021). *Psychometrics*: *An introduction*. Sage Publications Inc. Rust, J., & Golombok, S. (2018). *Modern Psychometrics*. Routledge. Shultz, K. S., Whitney, D. J., & Zickar, M. J. (2021). *Measurement theory in action: Case studies and exercises*. Routledge. Field, A. (2018). *Discovering Statistics Using IBM SPSS Statistics* (5th ed.). Sage Publications. Navarro, D. J., and Foxcroft, D. R. (2022). *Learning statistics with jamovi: A tutorial for psychology students and other beginners.* (This textbook can be downloaded from https://www.learnstatswithjamovi.com). **Supplementary** Allen, M. J., & Yen, W. M. (1979). *Introduction to measurement theory*. Monterey, CA: Brooks/Cole. Ghiselli, E. E., Campbell, J. P., & Zedeck, S. (1981). *Measurement theory for the behavioral sciences*. San Francisco, CA: Freeman.	

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.