

Identification	Subject Title, code and credit hours	Psychometrics, CPSY 560, 3KU (6 AKTS)
	Department	Psychology
	Program (bachelor's and master's degree)	Master
	Associated Term	Fall Semester 2026
	Instructor	Prof. Dr. Murat Yildirim
	E-mail:	muratyildirimphd@gmail.com
	Phone	+4407709627782
	Lecture room/Schedule	Neftchilar campus
	Consultations	After classes
Prerequisites	-	
Language	English	
Compulsory/Elective	Mandatory	
Textbooks and course materials	Main textbooks - Goss-Sampson, M. A. (2022). <i>Statistical analysis in JASP: A guide for students</i> (5th ed.). University of Greenwich. https://jasp-stats.org/jasp-materials/ - Hernández, A., Hidalgo-Montesinos, M. D., Hambleton, R. K., & Gómez-Benito, J. (2020). International Test Commission guidelines for test adaptation: A criterion checklist. <i>Psicothema</i>, 32(3), 390–398. - Kline, P. (2015). <i>A handbook of test construction (psychology revivals): Introduction to psychometric design</i>. Routledge. - Navarro, D. J., Foxcroft, D. R., & Faulkenberry, T. J. (2019). <i>Learning statistics with JASP: A tutorial for psychology students and other beginners</i> (Version 0.7). University of New South Wales. https://learnstatswithjasp.com/ Additional readings - Furr, R. M. (2021). <i>Psychometrics: an introduction</i>. SAGE publications. - DeVellis, R. F., & Thorpe, C. T. (2021). <i>Scale development: Theory and applications</i>. Sage publications. - Brown, T. A. (2015). <i>Confirmatory factor analysis for applied research</i>. Guilford publications. - Embretson, S. E., & Reise, S. P. (2013). <i>Item response theory for psychologists</i>. Psychology Press.	
Course description	This course provides graduate students with a comprehensive foundation in psychometric theory and its practical application to psychological measurement. The course covers the principles of measurement, test construction, item writing, reliability, validity, item analysis, exploratory and confirmatory factor analysis, measurement invariance, and item response theory. Particular emphasis is placed on the practical use of JASP for conducting and interpreting psychometric analyses. Students will also examine principles of test adaptation and develop skills in evaluating psychological instruments across different populations and contexts. Through lectures, classroom activities, case analyses, and practical exercises, students will learn to critically evaluate psychometric evidence and communicate statistical findings clearly and appropriately.	
Course objective	1. Develop students' understanding of the fundamental principles and theoretical foundations of psychological measurement and psychometrics. 2. Develop practical skills in using JASP for conducting and interpreting psychometric analyses. 3. Enable students to construct, evaluate, and critically assess psychological tests and measurement instruments. 4. Develop students' ability to evaluate reliability, validity, and item-level evidence for psychological measures.	

	- Introduce students to exploratory and confirmatory factor analysis, measurement invariance, and item response theory. - Develop students' ability to evaluate and apply appropriate procedures for psychological test adaptation across populations and cultural contexts. - Strengthen students' ability to interpret, critically evaluate, and report psychometric findings in a clear and scientifically appropriate manner.		
Learning Outcomes	- Explain fundamental concepts and principles of psychometrics, psychological measurement, test construction, and item development. - Apply JASP to conduct basic and advanced psychometric analyses and interpret the resulting output. - Construct and evaluate psychological test items and identify potential problems in item quality. - Assess and interpret different forms of reliability and explain their implications for psychological measurement. - Evaluate different sources of validity evidence and critically assess construct validity. - Conduct and interpret item analysis using appropriate statistical indicators. - Conduct and interpret exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) using JASP. - Explain and evaluate measurement invariance and its importance when comparing psychological measures across groups. - Apply and interpret basic item response theory (IRT) analyses and evaluate item characteristics. - Explain and apply key principles of psychological test adaptation across languages, cultures, and populations. - Critically evaluate the psychometric quality and suitability of psychological tests for research and applied settings. - Prepare and communicate clear, accurate, and appropriately structured psychometric reports based on statistical analyses and relevant evidence.		
Teaching methods	Lecture	+	
	Group discussion	+	
	Classroom activity	+	
	Cases analyzing	+	
Evaluation Criteria	Methods	Date	Perc. (%)
	Midterm exam	Week 8	30
	Participation	During semester	5
	Presentation	During semester	20
	Final exam	Week 16	40
	Attendance	During semester	5
	Total		100
Class Policy	Assessment and Marking Criteria Midterm Exam (35%) – Week 8 The midterm will assess students' understanding of foundational psychometric concepts and their ability to apply JASP to reliability, validity, and item analysis tasks. Participation (15%) – Throughout the Semester Active engagement in lectures and labs is expected. Students should come prepared, contribute to discussions, ask relevant questions, and demonstrate respect for peers' perspectives. Final Exam (40%) – Week 16 The final exam will evaluate students' mastery of advanced		

psychometric methods, including factor analysis, SEM, measurement invariance, and IRT, as well as their ability to interpret and report results. • Attendance (10%) – Throughout the Semester Regular attendance is required to benefit from the interactive lab sessions. More than two unexcused absences may negatively affect this component. Each lesson is designed to encourage creativity and active engagement, so students are expected to approach every session with focus and participation. To maintain a productive learning environment, disruptive behavior, unethical actions, unauthorized or irrelevant discussions, and the use of mobile phones, listening devices, or other unrelated equipment are strictly prohibited during class. Regular attendance is essential, and students should inform the faculty dean in advance if they are unable to attend due to illness, family circumstances, or other valid reasons. Please note that students who miss more than 25% of the total course hours will not be permitted to sit for the exam. Active participation in all sessions is highly valued, and punctuality is required, as lateness and other violations of classroom conduct will be taken seriously. Permitted Uses of AI Students may use AI tools to: • clarify and explain psychometric and statistical concepts; • obtain alternative explanations of difficult topics; • generate examples, practice questions, and study materials; • assist with brainstorming research or presentation ideas; • develop keywords and search strategies for academic literature; • assist with organizing notes and study materials; • support the interpretation of general statistical concepts; • receive guidance on using JASP and understanding statistical procedures; • check grammar, language, and clarity of students' own academic writing; • identify potential limitations or alternative interpretations of an analysis.		
Week	Topic	Textbook
1.	Introduction to Psychometrics and JASP	Navarro, D.J., Foxcroft , D.R., & Faulkenberry , T.J. (2019). Learning Statistics with JASP: A Tutorial for Psychology Students and Other Beginners (0.7). University of New South Wales. https://learnstatwithjasp.com/ Chapter 1 Goss-Sampson, M. (2022). Statistical Analysis in JASP: A Guide for Students (5th Edition). University of Greenwich. https://jasp-stats.org/jasp-materials/ Chapter 1
2.	Foundations of Measurement	Kline, P. (2015). A handbook of test construction (psychology revivals): introduction to psychometric design. Routledge. Chapter 2
3.	Test Construction and Item Writing	Kline, P. (2015). A handbook of test construction (psychology revivals): introduction to psychometric design. Routledge. Chapter 3
4.	Reliability in JASP	Navarro, D.J., Foxcroft , D.R., & Faulkenberry , T.J. (2019). Learning Statistics with JASP: A Tutorial for Psychology Students and Other Beginners (0.7).

		University of New South Wales. https://learnstatswithjasp.com/ Chapter 5 Goss-Sampson, M. (2022). Statistical Analysis in JASP: A Guide for Students (5th Edition). University of Greenwich. https://jasp-stats.org/jasp-materials/ Chapter 4
5.	Advanced Reliability in JASP	Navarro, D.J., Foxcroft , D.R., & Faulkenberry , T.J. (2019). Learning Statistics with JASP: A Tutorial for Psychology Students and Other Beginners (0.7). University of New South Wales. https://learnstatswithjasp.com/ Chapter 6 Goss-Sampson, M. (2022). Statistical Analysis in JASP: A Guide for Students (5th Edition). University of Greenwich. https://jasp-stats.org/jasp-materials/ Chapter 5
6.	Validity Concepts	Kline, P. (2015). A handbook of test construction (psychology revivals): introduction to psychometric design. Routledge. Chapter 4
7.	Construct Validity	Kline, P. (2015). A handbook of test construction (psychology revivals): introduction to psychometric design. Routledge. Chapter 5
8.		Midterm exam
9.	Item Analysis with JASP	Navarro, D.J., Foxcroft , D.R., & Faulkenberry , T.J. (2019). Learning Statistics with JASP: A Tutorial for Psychology Students and Other Beginners (0.7). University of New South Wales. https://learnstatswithjasp.com/ Chapter 7 Goss-Sampson, M. (2022). Statistical Analysis in JASP: A Guide for Students (5th Edition). University of Greenwich. https://jasp-stats.org/jasp-materials/ Chapter 6
10.	Exploratory Factor Analysis	Navarro, D.J., Foxcroft , D.R., & Faulkenberry , T.J. (2019). Learning Statistics with JASP: A Tutorial for Psychology Students and Other Beginners (0.7). University of New South Wales. https://learnstatswithjasp.com/ Chapter 8 Goss-Sampson, M. (2022). Statistical Analysis in JASP: A Guide for Students (5th Edition). University of Greenwich. https://jasp-stats.org/jasp-materials/ Chapter 7 Kline, P. (2015). A handbook of test construction (psychology revivals): introduction to psychometric design. Routledge. Chapter 3
11.	Confirmatory Factor Analysis	Navarro, D.J., Foxcroft , D.R., & Faulkenberry , T.J. (2019). Learning Statistics with JASP: A Tutorial for Psychology Students and Other Beginners (0.7). University of New South Wales. https://learnstatswithjasp.com/ Chapter 9 Goss-Sampson, M. (2022). Statistical Analysis in JASP: A Guide for Students (5th Edition). University of Greenwich. https://jasp-stats.org/jasp-materials/ Chapter 3 Kline, P. (2015). A handbook of test construction (psychology revivals): introduction to psychometric design. Routledge. Chapter 4
12.	Measurement Invariance	Navarro, D.J., Foxcroft , D.R., & Faulkenberry , T.J. (2019). Learning Statistics with JASP: A Tutorial for

		Psychology Students and Other Beginners (0.7). University of New South Wales. https://learnstatswithjasp.com/ Chapter 10 Goss-Sampson, M. (2022). Statistical Analysis in JASP: A Guide for Students (5th Edition). University of Greenwich. https://jasp-stats.org/jasp-materials/ Chapter 7 Kline, P. (2015). A handbook of test construction (psychology revivals): introduction to psychometric design. Routledge. Chapter 5
13.	Item Response Theory in JASP	Navarro, D.J., Foxcroft , D.R., & Faulkenberry , T.J. (2019). Learning Statistics with JASP: A Tutorial for Psychology Students and Other Beginners (0.7). University of New South Wales. https://learnstatswithjasp.com/ Chapter 11 Goss-Sampson, M. (2022). Statistical Analysis in JASP: A Guide for Students (5th Edition). University of Greenwich. https://jasp-stats.org/jasp-materials/ Chapter 8
14.	Test Adaptation	Hernández, A., Hidalgo Montesinos, M. D., Hambleton, R. K., & Gómez Benito, J. (2020). International test commission guidelines for test adaptation: A criterion checklist. <i>Psicothema</i>, 2020, vol. 32, num. 3, p. 390-398. Chapter 4
15.	Reporting Psychometrics with JASP	Navarro, D.J., Foxcroft , D.R., & Faulkenberry , T.J. (2019). Learning Statistics with JASP: A Tutorial for Psychology Students and Other Beginners (0.7). University of New South Wales. https://learnstatswithjasp.com/ Chapter 12 Goss-Sampson, M. (2022). Statistical Analysis in JASP: A Guide for Students (5th Edition). University of Greenwich. https://jasp-stats.org/jasp-materials/ Chapter 8
16.	Final Exam	