**Course description form**

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| Instructor's name: | Cees Glas, Univ. of Twente, Netherlands |
| Course title: | **IV.1 Test Scaling/Equating** |
| Course type: | Lectures/Workshop |
| Number of credit hours per edition: | 10 x 45 min of lecture and 10 x 45 min of workshop |
| ECTS | 4 |
|  | Lecture: 10hWorkshop:10hReading compulsory as well as supplementary literature and assimilating new knowledge: 40hPreparing for training, preparation tasks: 60hThe total number of hours 120, corresponding to 4 ECTS points |
| Software to be used: | MIRT software, public domain |
| Teaching day schedule preferences: | 2 x 45 min units + 15 min break |
| Course objectives: | At the end of the course the student is able to:* Understand the purpose of equating, scaling and linking and distinguish procedures and methods for this purpose
* Understand the fundamental concepts, such as designs and assumptions underlying statistical methods
* Compute scaling, linking and equating functions, using classical test theory observed score models and latent variable models such as item response theory models.
* Evaluative the appropriateness and precision of scaling, linking and equating results.
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| Knowledge: | Know and understand the purpose of equalizing and combining the results of testsKnow and understand the idea of ​​planning analysis and assumptions using statistical methods |
| Abilities: | Distinguish between procedures and methods, and combine the results of equatingCalculate the equation of the functions and combine the results using the methods in the KTT and IRTAble to assess the accuracy and precision of the results |
| Social competences: | Able to use the knowledge and skills to teach client-discussion skills |
| Prerequisites: | Basic knowledge of statisticsHands-on experience with SPSS |
| Pass requirements: | Pass requirements will be based on the quality of the individual reports of the practicals |
| Recommended reading: | None |
| Course plan: | Material:* Kolen, M. J. & Brennan, R. L. (2004). Test Equating, Scaling, and Linking. Methods and practices. Second Edition. Springer. ISBN 0387400869
* MIRT manual (public domain)

Sessions1. Introduction to the principles of equating, linking and scaling
2. Observed score equating using linear and equipercentile methods
3. Equating methods based on item response theory
4. Linking methods based on item response theory
5. Student presentations

Workshop1. Introduction to MIRT
2. Practical SPSS
3. Practical MIRT
4. Student presentations
5. Student presentations
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| Instructor's name: | Cees Glas, Univ. of Twente, Netherlands |
| Course title: | **IV.2 Differential Item Functioning (DIF)/Item Parameter Drift (IPD)** |
| Course type: | Lectures/Workshop |
| Number of credit hours per edition: | 10 x 45 min of lecture and 10 x 45 min of workshop |
| ECTS | 4 |
|  | Lecture: 10hWorkshop:10hReading compulsory as well as supplementary literature and assimilating new knowledge: 40hPreparing for training, preparation tasks: 60hThe total number of hours 120, corresponding to 4 ECTS points |
| Software to be used: | SPSSMIRT software, public domain |
| Teaching day schedule preferences: | 2 x 45 min units + 15 min break  |
| Course objectives: | At the end of the course the student is able to:1. critically reflect on the concept of differential item and test functioning, its impact on the fairness of testing and the principles underlying statistical techniques for identifying DIF
2. apply much used techniques for detection of DIF, including the Mantel-Haenszel technique, techniques based on factor analysis and techniques based on IRT
3. apply techniques for modeling DIF, such as using virtual item parametersunderstand the concept of parameter drift, its impact on measurement precision, and methods to detect IPD
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| Knowledge: | Know and understand the basics of statistical techniques for detecting DIF |
| Abilities: | Able to critically assess the impact of DIF on fairness and accuracy of test resultsCan be used to test data popular technique for detecting DIF, including the Mantel-Haenszel test, the technique based on FA and IRT |
| Social competences: | Able to use knowledge and skills to teach the known content and discuss with the client |
| Prerequisites: | Basic knowledge of statisticsHands-on experience with SPSS |
| Pass requirements: | Pass requirements will be based on the quality of the individual reports of the practicals |
| Recommended reading: | None |
| Course plan: | Material:* Holland, Paul W., & Wainer, Howard *Differential Item Functioning.*Hardcover. ISBN 9780805809725 Routledge.
* MIRT manual (public domain)

Sessions:1. History and Perspective
2. The Mantel-Haenszel approach
3. Top-down IRT based approaches
4. Bottom-up approaches based on factor analysis
5. Parameter drift in educational surveys and computerized adaptive testing

Workshop1. Introduction to MIRT
2. Practical Mantel-Haenszel
3. Practical MIRT
4. Practical factor analysis
5. Practical parameter drift
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| Instructor's name: | Cees Glas, Univ. of Twente, Netherlands |
| Course title: | **IV.3 Setting Performance Standard - Criterion-Referenced Test (CRT)** |
| Course type: | Lectures/Workshop |
| Number of credit hours per edition: | 10 x 45 min of lecture and 10 x 45 min of workshop |
| ECTS | 4 |
|  | Lecture: 10hWorkshop:10hReading compulsory as well as supplementary literature and assimilating new knowledge: 40hPreparing for training, preparation tasks: 60hThe total number of hours 120, corresponding to 4 ECTS points |
| Software to be used: | SPSSMIRT software, public domain |
| Teaching day schedule preferences: | 2 x 45 min units + 15 min break  |
| Course objectives: | At the end of the course the student is able to:1. apply much used methods (Angoff, JPC, DPM, examinee selection method, holistic booklet method, bookmark method (IRT), analytical method) in a practical context where aggregated decision rules have to be developed and validated dealing with the question whether or not candidate’s performance is satisfactorily enough for being accepted/certified for the professional practice,
2. identify inter and intra-assessor inconsistencies in setting performance standards,
3. reflect critically on the problems of authenticity and generalizability occurring in complex performance assessments as well as the natural tension existing between them,
4. apply psychometric criteria provided by generalizability and decision studies (G- en D studies) (such as, computing G-coefficients, inter-assessor reliability/agreement coefficients, and computing how many assessors are needed for achieving a desired measurement precision),
5. present a product with a set of performance descriptors/ indicators, procedures for establishing proficiency levels and proficiency level descriptions, performance standards as outcomes of the standard-setting process, G- and D studies.
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| Knowledge | Know and understand the principles and procedures for testing standards |
| Abilities | Able to select and apply Angoff, JPC, DPM, examinee selection method, a holistic method booklet, bookmark method (IRT), and analytical method in a practical contextAble to critically address the problem of generalization in complex systems, setting standards for testingCan be used in practice psychometric criteria (G-coefficients, inter-assessor more reliability / agreement coefficients, and calculation of the number of judges needed to obtain the target level of precision) |
| Social competences | Moderate and participate in planning and carry out procedures for setting standards for testing |
| Prerequisites: | Basic knowledge of statisticsHands-on experience with SPSS |
| Pass requirements: | Pass requirements will be based on the following two components:* The quality of presenting selected chapters (individually), including the discussion questions (50%).
* The quality of the essays (individually) about standard setting (50%).
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| Recommended reading: | None |
| Course plan: | Material:* Cizek, Gregory J. & Bunch, Michael B. *Standard Setting – A guide to establishing and evaluating performance standards on tests*. Paperback. ISBN13: 9781412916837. Sage.
* MIRT manual (public domain)
* NCME instructional module Generalizability Theory (public domain)
* Various articles for student presentations (to be distributed)

Sessions:1. Introduction classical and modern test theory
2. Standard setting for linear tests
3. Introduction generalizability theory
4. Standard setting for complex performance assessments
5. Student presentations

Workshop1. Introduction to MIRT
2. Student presentations
3. Student presentations
4. Practical SPSS
5. Practical MIRT
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