**Syllabus**

|  |  |
| --- | --- |
| **Instructor's name:** | Agnes Stancel-Piątak |
| **Course title:** | Structural Equation Modeling (SEM) with Mplus Using Large Scale Assessment Data |
| **Course type:** | Workshop  |
| **Number of credit hours per edition:** | 30 x 45 min  |
| **ECTS** | 3ECTS |
|  | Workshop:30h |
| **Software to be used:** | SPSS, Mplus |
| **Teaching day schedule preferences:** | *Day 1**3 x 90 min – sessions with 1 x 15 min breaks and 1 x 90 min lunch break**Day 2-4**4 x 90 min – sessions with 2 x 15 min breaks and 1 x 90 min lunch break* |
| **Knowledge** | After this workshop, students will possess **knowledge** regarding:* Theory of SEM
* Different models in SEM and their specifications for testing hypotheses
* Practical applications of SEM to Large Scale Assessment data with a specific set of methods
 |
| **Abilities** | After the course students will have the **abilities** to:* Correctly apply analysis of latent constructs using large scale data considering specific issues, such as plausible values, sampling weights etc.
* Specify latent models using Mplus software
* Justify the goodness of fit and choose appropriate models using model comparison techniques
* Interpret the results
* Test their hypotheses using Structural Equation Modeling (SEM) with Mplus
 |
| **Social competences** | * Critical interpretation and justification of SEM analysis presented in the current research
* Recognitions of possibilities and complexities of the method in hypothesis testing
* Understanding the implications, advantages and limitations of the method
 |
| **Course objectives:** | The objective of this workshop is to provide an introduction to the basic theory and application of or structural equation modeling (SEM), making special stress on those features that are particular to Large Scale Assessment data in general and the IEA studies; for example, how to deal correctly with sampling and design weights, plausible values, etc. |
| **Prerequisites:** | Knowledge of basic statistics and SPSSKnowledge of basic statistics is necessary to understand the more complex method of MLM. An understanding of methods of the inferential statistics (regression, correlation, and factor analysis) is helpful. |
| **Pass requirements:** | Actively participate during presentations in workshopActively participate in hands-on trainingsDevelop hypothesis and analysis plan and implement the models with MplusPresent results of above listed exercises to the colloquium |
| **Recommended reading:** | Geiser, C. (2013). *Data analysis with Mplus*. Guilford Press.Hox, J. J., & Bechger, T. M. (2007). An introduction to structural equation modeling. Retrieved from http://dspace.library.uu.nl/handle/1874/23738Lee, S.-Y. (2007). *Handbook of latent variable and related models*. Amsterdam; Boston: Elsevier/North-Holland. Retrieved from http://public.eblib.com/EBLPublic/PublicView.do?ptiID=287939Muthén & Muthén -- Home Page. (n.d.). Retrieved December 11, 2013, from http://www.statmodel.com/Tomarken, A. J., & Waller, N. G. (2005). Structural Equation Modeling: Strengths, Limitations, and Misconceptions. *Annual Review of Clinical Psychology*, *1*(1), 31–65. doi:10.1146/annurev.clinpsy.1.102803.144239 |
| **Course plan:** | **Exercise 1** Aim: Hands-on-trainings – Running latent models with a prepared data setOutcome: Participants will learn to run latent models in Mplus and to read the outputForm: group-work**Exercise 2** Aim: Interpretation and discussion on the results of analyses conducted with MplusOutcome: Participants learn to interpret and justify the results of analyses with SEM. Also possible model modifications are discussedForm: colloquium**Exercise 3**Aim: Development of hypothesisOutcome: Applying the knowledge on SEM and sampling design participants will learn, how to develop a new research question and an analysis planForm: group-work/individually**Exercise 4**Aim: Data preparation for Mplus and analysis with HLMOutcome: Participants will learn how to prepare an appropriate data set with SPSS and how to apply the analysis of earlier developed hypothesis with Mplus.Form: group-work/individually**Exercise 5** Aim: Interpretation and critical justification of the resultsOutcome: Participants learn, how to choose the best model, to interpret it and also how to justify the contribution of the analysis to existing research considering the limitations of the methodForm: group work/colloquium |
|  |  |