Syllabus:

1. Introduction.

2. Topics covered and resources.
   - literature,
   - software.

3. The goals of a missing data analysis.
   - aims of ‘conventional’ analyses,
   - aims of statistical analyses with missing data.

4. The problem and types of missing data.
   - what is relevant to focus on when faced with missing data (pattern and mechanisms of missing data),
   - missing completely at random (MCAR), observed at random (OAR),
   - sufficient and necessary conditions, and what is necessary for MCAR,
   - how to check for OAR,
   - analysis of MCAR data,
   - missing at random (MAR),
   - ignorable missingness and nonignorable missingness

5. Traditional ways of dealing with missing data.
   - listwise deletion,
   - pairwise deletion,
   - dummy variable adjustment,
   - simple imputation methods (unconditional and conditional fill-in, hot-deck imputation),
   - weighting.

6. Full information maximum likelihood (FIML) in the presence of missing data.
   - what is FIML,
   - likelihood function for an incomplete data set,
   - fitting models to data using FIML,
   - examples of FIML applications,
     . fitting the general linear model with missing data,
     . a brief introduction to Mplus,
longitudinal data analysis with incomplete data,
the intercept and slope (IS) model for longitudinal data,
individual trajectories of temporal development,
a simple regression model for change over time,
centering of time and intercept interpretation,
an empirical application of the IS model,
inclusion of ‘informative’ correlates of missing values as predictors.

7. Multiple imputation
   - what is multiple imputation (MI),
   - how does MI work,
     . simple setting,
     . general setting,
   - illustrations of MI
     . analysis of missing data with predictors/covariates measured without error,
     . analysis of missing data using predictors/covariates measured with error,
   - integration of imputation and model fitting in single software (Mplus).

8. Conclusion.