



## DEPARTMENT OF LEARNING, INFORMATICS, MANAGEMENT AND ETHICS

### **C7F2858, Longitudinal Data Analysis - Classical and Modern Statistical Methods, 3 credits (hec)**

Longitudinell dataanalys - klassiska och moderna statistiska metoder, 3

högskolepoäng

*Third-cycle level / Forskarnivå*

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#### **Approval**

This syllabus was approved by the The Committee for Doctoral Education on 2023-11-06, and was last revised on 2024-09-19. The revised course syllabus is valid from spring semester 2025.

#### *Responsible department*

Department of Learning, informatics, Management and Ethics, Faculty of Medicine

#### **Prerequisite courses, or equivalent**

Knowledge on parameter estimation and interpretation in multivariable linear regression analyses. Experience in using statistical software programs, preferably R, SPSS or STATA.

#### **Purpose & Intended learning outcomes**

##### **Purpose**

The aim of the course is to introduce statistical models and methods for the analysis of longitudinal data and to develop statistical skills of analyzing dependent data.

##### **Intended learning outcomes**

After successful completion of the course the student will be able to: 1. Understand the underlying characteristics of longitudinal data 2. Identify appropriate tests for longitudinal studies 3. Manage longitudinal datasets and prepare these for statistical analysis using statistical software program R, SPSS or STATA 4. Apply both simple and complex statistical methods of longitudinal data 5. Use R, SPSS or STATA to perform the above mentioned statistical analysis 6. Present and interpret the results of analysis.

## Course content

The main focus will be on frequently used statistical methods and how these should be used to provide more insight concerning research questions in longitudinal studies. Thus the course covers both classical and modern methods to analyze longitudinal data. Topics include Univariate repeated measures analysis of variance, Multivariate repeated measures analysis of variance, Drawbacks and limitations of classical methods; General linear models for longitudinal data; Linear mixed effects models. The underlying mathematical theory will not be stressed, and the main focus will be on concepts and applications.

## Forms of teaching and learning

Teaching methods include lectures, computer based exercise and seminars. Participants will have access to materials from a number of studies and are given the opportunity to use the statistical software program, R, SPSS or STATA during practice sessions. In addition, you will have seminars, group discussion and presentations.

### *Language of instruction*

The course is given in English

## Grading scale

Pass (G) /Fail (U)

## Compulsory components & forms of assessment

### Compulsory components

Computer based exercises, seminars, presentations and some lectures are mandatory. The course leader assesses whether and if so, how absence can be compensated.

### Forms of assessment

Assessment of attainment of the intended learning outcomes by a passing grade on the computer based exercises, and the performance during the final seminar.

## Course literature

Recommended literature: Fitzmaurice, G. M., Laird, N. M., & Ware, J. H. (2011). Applied longitudinal analysis (Vol. 998). John Wiley & Sons.