



## Analyse van geclusterde en longitudinale data (C003398)

Cursusomvang (nominale waarden; effectieve waarden kunnen verschillen per opleiding)

Studiepunten 5.0      Studietijd 150 u      Contacturen 62.5 u

Aanbodssessies en werkvormen in academiejaar 2017-2018

A (semester 2)	Engels	hoorcollege	22.5 u
		werkcollege: PC-	22.5 u
		groepswork	17.5 u
B (semester 2)		werkcollege: PC-	22.5 u
		hoorcollege	22.5 u
		groepswork	17.5 u

Lesgevers in academiejaar 2017-2018

Vansteelandt, Stijn	WE02	Verantwoordelijk lesgever
Pircalabelu, Eugen	WE02	Medelesgever
Stijnen, Theo		Medelesgever

Aangeboden in onderstaande opleidingen in 2017-2018

	stptn	aanbodssessie
<a href="#">Master of Science in Bioinformatics (afstudeerrichting Systems Biology)</a>	5	A
<a href="#">Master of Science in Statistical Data Analysis</a>	5	B
<a href="#">Uitwisselingsprogramma Bioinformatics (niveau master)</a>	5	A

Onderwijstalen

Engels

Trefwoorden

Growth curves, longitudinal data analysis, marginal analysis, random effects methods, multilevel analysis

Situering

To provide the student with statistical methods for the analysis of clustered continuous and categorical data, with an emphasis on repeated measures over time. To understand clearly the difference between a marginal analysis and a conditional random effects analysis. Learn how to model correlation structures. Make predictions with justified error margins based on well understood assumptions. Create an awareness of the potential selectivity associated with measurement timing and attrition in the data set.

Inhoud

- Summary statistics for repeated measures over time
  - Covariance structures
  - Marginal analysis and generalized estimating equations
  - Conditional analysis and random-effects methods
  - ML and REML methods
  - Growth curves
  - Multilevel data
  - Model-fitting versus prediction
  - Balancing pros and cons of marginal versus conditional methods
  - Fixed versus random measurement-times
  - Design and sample size, more individuals versus more measures per individual
  - The impact of attrition (missing data) on the analysis
- Applications in ecology, economy, epidemiology, medicine, agriculture, sociology...

## Begincompetenties

### Analysis of Continuous Data

## Eindcompetenties

- 1 Have knowledge of the basic theories and concepts of methods for the analysis of clustered and longitudinal data.
- 2 The students can present and fit appropriate models for correlated data and repeated measures over time.
- 3 They will recognize the problem of bias when measurement points are selectively chosen.
- 4 They can design studies to obtain relevant information in an unbiased and efficient way.
- 5 They can analyse data sets with repeated continuous and categorical data with appropriate software.
- 6 They can draw justified conclusions and report them in a correct and transparent fashion.
- 7 They can critically read clustered data analysis and longitudinal analysis reports in the scientific literature.

## Creditcontractvoorwaarde

Toelating tot dit opleidingsonderdeel via creditcontract is mogelijk mits gunstige beoordeling van de competenties

## Examencontractvoorwaarde

Dit opleidingsonderdeel kan niet via examencontract gevolgd worden

## Didactische werkvormen

Groepswerk, hoorcollege, werkcollege: PC-klasoefeningen

## Leermateriaal

Extensive slides and text book (price +/- 75 EUR):  
Fitzmaurice, G., Laird, N. and Ware, J. (2004). Applied Longitudinal Analysis. Wiley.

## Referenties

Heagerty, P., Liang, K.-Y., Zeger, S.L. and Diggle, P. (2002). Analysis of Longitudinal Data. Oxford University Press.  
Fitzmaurice, G., Laird, N. and Ware, J. (2004). Applied Longitudinal Analysis. Wiley.  
Verbeke, G. and Molenberghs, G. (2000). Linear Mixed Models for Longitudinal Data. Springer-Verlag.

## Vakinhoudelijke studiebegeleiding

Students are coached by assistants during PC-practicals. Through the electronic learning environment they can exchange questions and answers outside lecture hours. A series of projects will provide the students with practical experience in data analysis.

## Evaluatiemomenten

periodegebonden en niet-periodegebonden evaluatie

## Evaluatievormen bij periodegebonden evaluatie in de eerste examenperiode

Schriftelijk examen met open vragen, mondeling examen, werkstuk

## Evaluatievormen bij periodegebonden evaluatie in de tweede examenperiode

Schriftelijk examen met open vragen, mondeling examen, werkstuk

## Evaluatievormen bij niet-periodegebonden evaluatie

Werkstuk

## Tweede examenkans in geval van niet-periodegebonden evaluatie

Examen in de tweede examenperiode is mogelijk

## Toelichtingen bij de evaluatievormen

The knowledge and problem solving skills of the students are tested by means of a written exam and data analytic projects.

## Eindscoreberekening

Theory: periodic

Exercises: periodic and permanent (project work)

Two projects will be assigned. The final project must be orally defended.

Calculation of the total score: exam 60%, first project 10%, second project and oral defense 30%.

A second examination chance for the project is possible. Non-participation to at least

one of the project works implies a maximum score (exam + project) of at most 7/20, regardless of the score obtained on the final exam.