Studiefiche

Analyse van continue data (C003799)

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

Studiepunten 6.0	**Studietijd** 150 u	**Contacturen**	62.5 u

Aanbodsessies en werkvormen in academiejaar 2017-2018

A (semester 1)	werkcollege: PC-klasoefeningen	5.0 u
	hoorcollege	22.5 u
	groepswerk	2.5 u
	microteaching	5.0 u
	werkcollege: geleide oefeningen	5.0 u
	project	7.5 u
	zelfstandig werk	15.0 u

Lesgevers in academiejaar 2017-2018

Goetghebeur, Els	WE02	Verantwoordelijk lesgever

Aangeboden in onderstaande opleidingen in 2017-2018 stptn aanbodsessie

Master of Science in Statistical Data Analysis	6	A

Onderwijstalen

Engels

Trefwoorden

Confounding, Interaction, Model building, Model diagnostics, Multivariate linear models, Normal distribution, Prediction interval, Regression models, SAS, Statistical data analysis

Situering

The course builds on basic statistical understanding and skills, that is, the material offered in the course `Principles of statistical data analysis'. Several other courses in the program build in turn on this course, most directly all other courses involving regression modeling, such as `Analysis of categorical data', `Causality and missing data analysis', `Experimental Design', 'Longitudinal data analysis', 'Survival Analysis'. This course aims to provide the student with a basic insight in and skills for statistical modeling. This will primarily be developed in the context of multivariate linear models with independent normal errors.

Inhoud

- The simple linear regression model
- The least squares principle and its link with maximum likelihood
- Confidence intervals for conditional means, prediction intervals for new observations
- Graphical and formal diagnostic methods for the inspection of residuals
- Goodness-of-fit tests, checking the model assumptions
- The impact of transforming variables
- Box-Cox regression for non-linear associations
- Detection of influential observations through leverage and Cook's distance
- The link between linear regression and analysis of variance
- Balancing bias and efficiency
- An introduction to the law of iterated expectation
- The multiple regression model with joint predictors that can be binary, categorical and/or continuous
- Confounding and effect modification

- Procedures for stepwise building of a regression model
- Introduction to random intercept models
- Penalized linear regression methods

Begincompetenties

A basis in probability and statistics, such as that covered in `Principles of statistical data analysis', as well as basic matrix algebra.

Eindcompetenties

1 The student can recognize practical problems which can be solved by means of the (multivariate) linear model.
2 The student knows the distinction between association, prediction and causation, and understands the basic role of confounding in this context.
3 The student can interpret the linear model correctly, can fit it to a data set and draw justified conclusions in the theoretical as well as the practical sense.
4 The student can apply diagnostic techniques to check the fit of a (multivariate) linear model.
5 The student can adopt appropriate remedial measures when the current linear model does not fit.
6 The student knows and can derive basic properties of the estimators, paying attention to the distinction between estimation and prediction.
7 The student can link regression analysis with analysis of variance.
8 The student recognizes the limitations of the linear model, can suggest appropriate extensions and develop some methods via the maximum likelihood approach.
9 The student understands the role of efficiency and bias when designing a statistical study.
10 The student can collaborate with colleagues.
11 The student can adequately report results of the statistical analysis of continuous data: both orally and in writing.

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, microteaching, project, zelfstandig werk, werkcollege: geleide oefeningen, werkcollege: PC-klasoefeningen

Leermateriaal

A syllabus is available Geraamde totaalprijs: 10 EUR

Referenties

M. Kutner, C. Nachtsheim, J. Neter, W. Li. 'Applied Linear Regression Models', 5th edition. McGraw-Hill Education, 2004.

Vakinhoudelijke studiebegeleiding

Students are coached by assistants during PC-labs. Through the electronic learning environment they can exchange questions and answers outside lecture hours among themselves and with lecturers. A series of projects will provide the students with practical experience in data analysis. The students will receive coaching and feed back on these projects through organized sessions and feedback on an individual oral presentation.

Evaluatiemomenten

periodegebonden en niet-periodegebonden evaluatie

Evaluatievormen bij periodegebonden evaluatie in de eerste examenperiode

Schriftelijk examen met open vragen, openboekexamen

Evaluatievormen bij periodegebonden evaluatie in de tweede examenperiode

Schriftelijk examen met open vragen, openboekexamen, mondeling examen

Evaluatievormen bij niet-periodegebonden evaluatie

Mondeling examen, werkstuk

Tweede examenkans in geval van niet-periodegebonden evaluatie

Examen in de tweede examenperiode is mogelijk

Toelichtingen bij de evaluatievormen

First examination period:
The non-periodical evaluation takes the form of two take home problem sets for independent work and a data analytic project worked out in a team, one of which is also presented orally.

Second examination period:
The non-periodical evaluation takes the form of a project which oral defense.
The knowledge and problem solving skills of the students are tested.

Eindscoreberekening

Periodic evaluation (50%) + non-periodice evaluation (50%).
Students must pass both parts to pass the course.
Failed students have an option to retake the exam in a modified format in a second session.