Valid from 2024.HS

Module description: Statistical Modelling

Module Code	t.BA.XX.STMO.20HS
ECTS Credits	4
Language of Instruction/Examination	German
Organizational Unit	IDP
Module Coordinator	Andreas Ruckstuhl
Legal Framework	The module description is part of the legal basis in addition to the general academic regulations. It is binding. During the first week of the semester a written and communicated supplement can specify the module description in more detail.
Module Characteristic	Type 2a 4 consecutive lecture lessons per semester week and class
Module Description	The module introduces students to the basics of statistical modelling using linear regression analysis. Aspects of the model structure, inference, prediction, residuals analysis and model building, including variable selection, are examined in detail, both theoretically and in case studies.
Module Content	• imple and multiple regression models • estimations (incl. principle of maximum likelihood and robust methods), parameter tests, confidence and prediction intervals • model adequacy checking (residual analysis) • model comparison, variable selection (incl. information criterion of Akaike), model building • smoothing (local regression, smoothing spline), additive models • Statistics program package R: Statistics and graphics routines for the treated methods.
Prerequisite Knowledge	• Probability calculus • Statistical inference (estimation, testing, conficence intervals)

Learning Objectives (Competences)

Students...	Competencies	Taxonomies
You are familiar with practice-relevant methods of simple and multiple linear regression analysis and are able to interpret corresponding results	M, F	K3, K4
You can recognize from which principles the methods are derived	M, F	K2
You can develop a regression model using data	M, F	K3, K4, K5
You can assess whether the regression model fits the data	F, M	K3, K4, K6
You can apply the methods covered practically with a statistics program package.	F, M	K3

Performance Assessment

End-of-module exam	Assessment	Length (min.)	Weighting	Form
written exam	Grade	90	80	acc. to module agreement

Performance assessment during the semester	Assessment	Length (min.)	Weighting	Form
written exam	Grade	50	20	acc. to module agreement

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Classroom Attendance Requirement	None
Learning material	• Slides • Tutorials • Lecture Notes
Comments	Exam during the teaching period and its weighting is defined in the module agreement.