

Module description: Data Analysis and Forecasting						
Module Code	t.BA.VS.DP.09HS					
ECTS Credits	4					
Language of Instruction/Examination	German					
Organizational Unit	IDP					
Module Coordinator	Marcel Dettling					
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 is centered around multiple linear regression and time series analysis. These techniques are at the heart of statistical modelling and thus provide the basis for the analysis and prediction of important variables such as demand for transport, accident numbers, etc.					
Module Content	<ul style="list-style-type: none"> <li>Nonparametric Smoothing: idea and fundamental difference vs. parametric regression, knowledge and use of the most important smoothing algorithms as an aid for statistical modelling. . Simple Linear Regression: model and assumptions, fitting, confidence and prediction intervals, graphical presentation, model extensions by variable transformations. . Multiple Linear Regression: model and assumptions, fitting, confidence and prediction intervals, dealing with categorical predictor variables, model diagnostics, collinearity, model interpretation, estimation of prediction accuracy by cross validation. . Time Series Analysis: visualization, mathematical concepts, identifying trend and seasonality, time series decomposition, autocorrelation, autoregressive models, exponential smoothing, time series forecasting, point and interval forecasts, forecasting accuracy.</li> </ul>					
Prerequisite Knowledge						
Learning Objectives (Competences)	<b>Students...</b>		<b>Competencies</b>	<b>Taxonomies</b>		
	Fitting statistical regression models		M, F	K5		
	Differencing between systematic and non-systematic effects		F	K6		
	Determining significant predictor variables in regression models		M, F	K6		
	Generating predictions with regression and time series methods		M, F	K6		
Performance Assessment	<b>End-of-module exam</b>	<b>Assessment</b>	<b>Length (min.)</b>	<b>Weighting</b>	<b>Form</b>	
	written exam	Grade	90	80	acc. to module agreement	
	<b>Performance assessment during the semester</b>		<b>Assessment</b>	<b>Length (min.)</b>	<b>Weighting</b>	<b>Form</b>
	written exam		Grade	90	20	acc. to module agreement
Classroom Attendance Requirement	None					
Learning material						

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<b>Comments</b>	