Courses in English
Course Description

Department	09 Engineering and Management
Course title	**Data Analysis**
Hours per week (SWS)	4
Number of ECTS credits	4
Course objective	By the end of the course students will be capable to • understand the main statistical terms, tools and methods in the field of engineering and management • apply these tools and methods in order to solve problems in data analysis that originate from the areas of economics and technology, also by computer support (Excel) • interpret the results of the tools and methods appropriately • assess problems arising within the application of statistical methods (“statistical literacy”: correlation versus causality, conclusions for the population / statistical model, possibilities of manipulation)
Prerequisites	Modules Engineering Mathematics I and Engineering Mathematics II
Recommended reading	FAHRMEIR, Ludwig et. al., 2011. Statistik: Der Weg zur Datenanalyse. 7. Auflage, Berlin: Springer-Verlag. ISBN 978-3- 642-01938-8 BAMBERG, Günter, Franz BAUR and Michael KRAPP, 2012. Statistik. 17. Auflage, München: Oldenbourg Verlag. ISBN 987-3- 486-71651-1 WEIß, Christel, 2013. Basiswissen Medizinische Statistik. 6. Auflage, Berlin: Springer-Verlag. ISBN 978-3- 642-34260-8 HEUMANN, Christian et al., 2016. Introduction to Statistics and Data Analysis. 1. Auflage: Springer-Verlag. ISBN 978-3-319-46160-1
Teaching methods	lectures and exercises, 4 SWS
Assessment methods	Written Exam
Language of instruction	English
Name of lecturer	Prof. Dr. rer. nat. Carsten Voelkmann
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Link	
Course content	• Overview and basic terms of data analysis and statistics • Descriptive statistics for one and more dimensional data - Tables - Graphical representation - Measures (Measures of central tendency, measures of variance, measures of form, measures of concentration, measures of association / correlation) • Probability calculus - Combinatorics - Probability - Random variables, discrete and continuous distributions • Inferential statistics - Parameter estimation: point estimation, confidence intervals - Hypothesis testing - Regression analysis: linear and nonlinear regression, simple and multiple regression
Remarks	Presence time for lectures and exercises: 60 hours Self-studies, preparation of lectures and exam: 60 hours