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:

Teaching methods: lectures and exercises, 4 SWS
Assessment methods: Written Exam
Language of instruction: English
Name of lecturer: Prof. Dr. rer. nat. Carsten Voelkmann
Email: carsten.voelkmann@hm.edu
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