Course: Process Data Analysis — credits: 5

Course code	CTVH26PROCESDATA
Name	Process Data Analysis
Study year	2026-2027
ECTS credits	5
Language	English
Coordinator	M.E.F. Apol

Modes of delivery	Assignment Tutorial
Assessments	Process Data Analysis - Theory - Other assessment

Learning outcomes

The module has the following learning outcomes:

You will import data from various sources (such as CSV, TXT and Excel files) into both Excel and Minitab, and select the appropriate methods and functions for different data formats and structures.

You will clean data in preparation for analysis in both Excel and Minitab, by applying techniques to identify and handle missing values, outliers, inconsistencies and duplicates.

You will apply and interpret various advanced data analysis functions in Excel and/or Minitab, including: ANOVA analyses (1-way, 2-way), time series analyses (correlation, correlation functions, principal component analysis), linear and non-linear regression (including model selection and interpolation) and categorical data analysis (1-way and 2-way chi-squared analyses, logistic regression).

You create effective and clear data visualisations in both Excel and Minitab (such as scatter plots, bar charts, line charts, pie charts and box plots) to communicate patterns, trends and relationships in data.

You will use and interpret methods and indices focused on statistical process control (Shewhart charts, process capability indices) in both Excel and Minitab.

The Process Data Analysis module covers the following components of the BOKS Chemical Technology:

Knowledge:

data processing and data analysis

process control

Skills:

Use and application of data analysis and processing software

Content

Making process facilities more energy-efficient requires the identification, adjustment and monitoring of key process parameters. This module covers the collection and cleaning of large volumes of process data, followed by the application of advanced statistical methods such as multivariate data analysis, e.g. multivariate regression, Principal Component Analysis (PCA) and Analysis of Variance (ANOVA). In addition, attention is given to visualising large amounts of data in a clear and effective manner. Finally, an introduction to Statistical Process Control (SPC) is provided. The lessons make use of the Excel and Minitab programmes. Students are required to bring their own laptop to the lessons.

This module forms part of the statistics learning pathway and builds on the previous statistics modules.

Included in programme(s)

Chemical Engineering

School(s)

Engineering, Life Sciences & ICT

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