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COURSE SYLLABUS

Foundations of Data-Driven Thinking, 2.5 credits

Grunder i datadrivet tänkande, 2.5 högskolepoäng

Course Code:	T2GIDT	Education Cycle:	Second-cycle level
Confirmed:	Sep 01, 2025	Disciplinary domain:	Technology
Valid From:	Aug 31, 2026	Subject group:	Materials Technology
		Specialised in:	A1N Second cycle, has only first-cycle course/s as entry requirements
		Main field of study:	Product Development

Intended Learning Outcomes (ILO)

On completion of the course the student shall:

Knowledge and understanding

- show familiarity with data-driven methods to analyse different types of manufacturing data (e.g. sensor, quality, and process data).

Skills and abilities

- demonstrate the ability to assess the quality of datasets with statistical tools and apply suitable countermeasures.
- demonstrate the ability to perform exploratory data analysis (EDA) on manufacturing data to identify trends, patterns, and outliers, and formulate hypotheses for future modelling and prediction of the data.

Judgement and approach

- demonstrate the ability to draw appropriate conclusions from the EDA to plan data-driven modelling and prediction activities that support relevant process improvement objectives.

Content

The course introduces foundational concepts of data-driven thinking with a focus on industrial manufacturing applications. Emphasis is placed on understanding data types, data quality, and exploratory data analysis (EDA) as a basis for sound analysis and informed decision-making.

Participants work with real or realistic industrial data to develop practical skills in data handling, visualization, and interpretation. The course highlights how early data quality assessment and exploration support robust process understanding and provide a foundation for advanced statistical and AI-based methods.

The course consists of the following elements:

- Foundations of data-driven decision-making in manufacturing.
- Manufacturing data types, including numerical and categorical data.
- Data quality, data cleaning and pre-processing.
- Exploratory data analysis (EDA): univariate and multivariate EDA methods
- A glimpse into modern AI methods for modelling and prediction.

Type of instruction

Lectures, assignments, discussion forums and in-person workshop/s.

Language of instruction is English.

Entry requirements

Academic degree of at least 180 ECTS credits within Engineering and/or Technology or passed courses of at least 40 credits in the main field of study within Engineering and/or Technology and at least 1 year of work experience in the manufacturing industry or at least 4 years of work experience in the manufacturing industry. Proof of English proficiency is required.

Examination and grades

The course is graded Pass (G) or Fail (U).

Registration of examination:

Name of the Test	Value	Grading
Assignment	2.5 credits	G/U

Other information

Students work on a small exploratory data analysis project. All required tools used in the course are accessible free of charge.

Course literature

Please note that changes may be made to the reading list up until eight weeks before the start of the course.

The main course literature will be provided on Canvas.