



## COURSE SYLLABUS

# Data-driven AI for Decision-makers, 5 credits

*Datadriven AI för beslutsfattare, 5 högskolepoäng*

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<b>Course Code:</b> TDDR24	<b>Education Cycle:</b> Second-cycle level
<b>Confirmed by:</b> Dean Sep 7, 2023	<b>Disciplinary domain:</b> Technology
<b>Revised by:</b> Director of Education Dec 6, 2023	<b>Subject group:</b> DT1
<b>Valid From:</b> Jan 1, 2024	<b>Specialised in:</b> A1N
<b>Version:</b> 2	<b>Main field of study:</b> Computer Science

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### Intended Learning Outcomes (ILO)

After a successful course, the student shall:

Knowledge and understanding

- demonstrate comprehension for how data-driven AI can be used for decision support in organizations
- display knowledge of tasks and techniques in data-driven AI

Skills and abilities

- demonstrate the ability to apply a process model to design a data-driven AI project
- demonstrate skills in using software to perform simple tasks in data-driven AI, from data pre-processing to evaluation

Judgement and approach

- demonstrate the ability to interpret and evaluate the results of a data-driven AI project, with respect to a decision-making situation
- demonstrate the ability to reason about data sources as the basis for AI and suggest appropriate pre-processing of data

### Contents

The course is aimed at decision-makers, in both industry and the public sector, who wish to gain knowledge about how data-driven AI can be utilized in organizations. The starting point of the course is on how business problems and decision-making in organizations relate to different tasks in data-driven AI. From this, the course explores how data-driven AI projects are conducted and evaluated. Participants will see examples from a variety of domains and problem types, to gain an understanding of how general approaches can be applied in different situations. The course also contains an overview of modern AI techniques and how these are used for different data analysis tasks. Practical experience in both project design and using AI techniques for data analysis will be given in workshops, seminars and project work. Throughout the course, emphasis will be placed on discussing both the technical aspects and the wider implications of using data-driven AI for decision support.

The course includes the following elements:

- Introduction to data-driven AI: terminology, context and evaluation from a business perspective
- Process model for data-driven AI, from business problem to deployment
- Problem types and tasks in AI, related to common business problems and decision-making situations in organizations: prediction, clustering, association rules, anomaly detection, sentiment analysis, text and picture analysis
- Overview of techniques for data-driven AI: decision trees, similarity-based techniques, support-vector machines, neural networks, ensemble models
- Data sources: pre-processing and data quality
- Practical work in a software tool
- Ethical and legal aspects of using data-driven AI in organizations

### Type of instruction

The course is given as an online course with a mix of digital resources, such as recorded lectures and quizzes, and online meetings. Course work in the form of a project is conducted throughout the course with online supervision and seminars. Participation in two online seminars on project work, scheduled in the evening, is mandatory.

The teaching is conducted in English.

### Prerequisites

Passed courses of at least 40 credits in a main field of study within Engineering and Technology, Natural Science or Social Sciences, and at least 1 year of work experience (or equivalent). English proficiency is required (level 6 or equivalent).

Applicants that have at least 4 years of work experience in the industry are exempt from the requirement of at least 40 credits within Engineering and Technology, Natural Science or Social Sciences field.

### Examination and grades

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

The final grade will only be issued after satisfactory completion of all mandatory examination elements.

Registration of examination:

Name of the Test	Value	Grading
Project	5 credits	U/G

### Course literature

The literature list for the course will be provided eight weeks before the course starts.

Title: Guide to Intelligent Data Science

Author(s): Berthold, Borgelt, Höppner, Klawonn, & Silipo (2020)

Publisher: Springer

ISBN: 978-3-030-45573-6 (available online through library services)

Title: Data Science

Author(s): Kelleher, J. D. & Tierney, B. (2018)

Publisher: MIT Essential Knowledge Series, MIT Press

ISBN: 9780262347037

Title: Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking

Author(s): Provost, F. & Fawcett, T. (2013)

Publisher: O'Reilly Media Inc.

ISBN: 9781449361327

Additional texts:

3-5 additional research articles and technical reports