



COURSE SYLLABUS

Datadriven mjukvaruutveckling Data-driven Software Engineering 7.5 credits (7,5 högskolepoäng)

Course code: PA2572

Main field of study: Software Engineering

Disciplinary domain: Technology

Education level: Second cycle

Specialization: AIN - Second cycle, has only first cycle course/s as entry requirements

Language of instruction: English

Applies from: 2023-01-16

Approved: 2022-09-01

1. Decision

This course is established by Dean 2018-05-22. The course syllabus is approved by Head of Department of Software Engineering 2022-09-01 and applies from 2023-01-16.

2. Entry requirements

Admission to the course requires completed courses in Data Structures and Algorithms, 6 credits, Mathematical Statistics, 6 credits, Software Development, 6 credits and Artificial Intelligence or Data analysis, 6 credits.

3. Objective and content

3.1 Objective

People, organizations, and processes generate increasing amounts of digital data, due to the pervasiveness of societal digitalization and the connectivity provided by Internet. On the one hand, these data present challenges concerning complexity, privacy, and security. On the other hand, the data may be used for automation of activities and to make more informed decisions. The aim of this course is to provide students with a theoretical understanding of data science and its benefits and limitations, as well as practical skills in the application of data-driven techniques to address tasks within the different stages of the software development lifecycle (SDLC).

3.2 Content

The course comprises of three overarching concepts: Theoretical analysis and reflection about a selected data analytics approach, Practical analysis and visualization of a software development related data set, and Practical implementation and evaluation of a knowledge extraction or decision making scenario. These broad concepts are broken down into methods, processes, and frameworks.

4. Learning outcomes

The following learning outcomes are examined in the course:

4.1 Knowledge and understanding

On completion of the course, the student will be able to:

- Describe basic data science approaches and concepts, and reason about their applicability for various SDLC related tasks.
- Explain and motivate the merits and potential weaknesses of a relevant data science approach.
- Analyze and describe the merits and potential weaknesses of a data set, when given a specific context and designated SDLC related task.

4.2 Competence and skills

On completion of the course, the student will be able to:

- Analyze typical data sets from SDLC related tasks
- Design, implement, and empirically evaluate data-driven techniques for SDLC related tasks
- Reason about the merits and weaknesses of a data set, given a specific task

4.3 Judgement and approach

On completion of the course, the student will be able to:

- Evaluate and compare data-driven approaches, given a specific context and data science task

5. Learning activities

Traditional lectures are accompanied by student led scientific seminars, which foster intellectual development, scientific interest and in-depth knowledge related to particularly relevant topics within the framework of data-driven software engineering. The students are expected to actively participate in the seminars. Fictional and real cases are provided in the form of data sets, context descriptions, and task descriptions. The students increase their practical competences and skills by applying various data-driven techniques to address tasks within the provided cases. The theoretical knowledge and practical skills attained are used as a basis to write and present a short scientific report that focuses on one data-driven technique and one specific case.

6. Assessment and grading

Modes of examinations of the course

Code	Module	Credits	Grade
2305	Seminar	1.5 credits	GU
2315	Project Assignment	1.5 credits	GU
2325	Written report[1]	4.5 credits	AF

[1] Determines the final grade for the course, which will only be issued when all components have been approved.

The course will be graded A Excellent, B Very good, C Good, D Satisfactory, E Sufficient, FX Fail, supplementation required, F Fail.

The information before a course occasion states the assessment criteria and make explicit in which modes of examination that the learning outcomes are assessed.

An examiner can, after consulting the Disability Advisor at BTH, decide on a customized examination form for a student with a long-term disability to be provided with an examination equivalent to one given to a student who is not disabled.

7. Course evaluation

The course evaluation should be carried out in line with BTH:s course evaluation template and process.

8. Restrictions regarding degree

The course can form part of a degree but not together with another course the content of which completely or partly corresponds with the contents of this course.

9. Course literature and other materials of instruction

The main literature consists of peer-reviewed articles available online and webpage documents. A content list with reading instructions is provided in the course memo.