Blekinge Institute of Technology
Department of Software Engineering

Revision: 1
Reg.no: BTH-4.1.14-0942-2023

COURSE SYLLABUS

Maskininlärningsteknik
Machine Learning Engineering
6 credits (6 högskolepoäng)

Course code: PA2595
Main field of study: Software Engineering, Computer Science
Disciplinary domain: Technology
Education level: Second cycle
Specialization: A1N - Second cycle, has only first cycle course/s as entry requirements

Language of instruction: English
Applies from: 2024-01-15
Approved: 2023-09-01

1. Decision
This course is established by Dean 2023-02-15. The course syllabus is approved by Head of Department of Software Engineering 2023-09-01 and applies from 2024-01-15.

2. Entry requirements
Admission to the course requires at least 120 credits, of which at least 90 credits are in a technical area, and a minimum of 2 years professional experience within an area related to software-intensive product and/or service development (shown by, for example, a work certificate from an employer).

3. Objective and content

3.1 Objective
The theoretical and practical aspects of applied machine learning are themselves clearly challenging to master. However, even the mastery of these aspects does not prepare one to build interfaces between the model solution and the real world. Moreover, it does not inform development patterns that ensure maintainable and reliable solutions that work as expected and according to specification. The aim of this course is to introduce students to a general machine learning engineering framework, and to provide them with the necessary knowledge and skills to efficiently create maintainable machine learning systems of high quality.

3.2 Content
The course is divided into two sequential building blocks: I) the ideation, planning, researching, testing, and evaluation of prototype machine learning systems, and II) the creation of maintainable machine learning systems using principles of modularity and standards, and the writing of production code and testing on production infrastructure.

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 the core tenets and goals of machine learning engineering.
- Explain how to develop modular, debuggable, and testable machine learning code.
- Describe how to test and evaluate machine learning prototypes.

4.2 Competence and skills
On completion of the course, the student will be able to:
- Digitalize and model a task to make it amenable for machine learning solutions.
- Collect, transform, clean, and organize a data set for a specific task.
- Setup and use a basic environment for prototyping and testing machine learning solutions.

4.3 Judgement and approach
On completion of the course, the student will be able to:

- Assess the quality and faithfulness of a digital model of a task or function.
- Compare competing solutions for a task to determine the best solution.

5. Learning activities

The teaching is organized around online lectures and student-led scientific seminars. The students are expected to participate in the seminars actively. The theoretical knowledge and practical skills attained are used as a basis to work on the course assessments. Throughout the course, communication, feedback, and discussions with teachers and fellow participants will take place through email and the course's online learning platform.

6. Assessment and grading

Modes of examinations of the course

Code	Module	Credits	Grade
2405	Seminar	1.5 credits	GU
2415	Presentation	0.5 credits	GU
2425	Project[1]	4 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 G Pass, UX Fail, supplementation required, U 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

Wilson, Ben (2022). Machine Learning Engineering in Action. Shelter Island, New York: Manning Publications. 554 pages.