

School of Science and Technology

Introduction to Machine Learning, 3 Credits

Course Code:	DT100U	Subject Area:	Field of Technology
Main Field of Study:	Computer Science	Credits:	3
Education Cycle:	Second Cycle	Subject Group (SCB):	Computer Science
Established:	2017-08-24	Progression:	AXX
Valid from:	Autumn semester 2017	Last Approved:	2017-08-24
		Approved by:	Head of School

Aims and Objectives

General aims for second cycle education

Second-cycle courses and study programmes shall involve the acquisition of specialist knowledge, competence and skills in relation to first-cycle courses and study programmes, and in addition to the requirements for first-cycle courses and study programmes shall

- further develop the ability of students to integrate and make autonomous use of their knowledge
- develop the students' ability to deal with complex phenomena, issues and situations, and
- develop the students' potential for professional activities that demand considerable autonomy, or for research and development work.

(Higher Education Act, Chapter 1, Section 9)

Course Objectives

Knowledge and understanding

Completing this course, the student will know about the fundamental concepts in machine learning, the different classes of machine learning algorithms, and ways to choose and apply different basic machine learning algorithms. Furthermore, the student will learn about ways to evaluate the performance of learning systems.

Applied knowledge and skills

Completing this course, the student will be able to prepare data and apply machine learning methods to achieve a learning goal within an intelligent system.

Making judgments and attitudes

Completing this course, the student will be able to judge the suitability of a machine learning paradigm for a given problem and the available data, have an understanding of the capabilities and limitations of the considered machine learning algorithms, and is able to identify problems or misleading results.

Main Content of the Course

- Core concepts and algorithms used for supervised and unsupervised learning.
- Application of machine learning algorithms for the tasks of classification and prediction.
- Methods for data preprocessing including normalisation, feature extraction and selection, dimensionality reduction, and re-balancing.
- Practical recommendations for applying machine learning algorithms.
- Evaluation and analysis of the performance of machine learning algorithms.
- Additional topics: Bias-Variance Dilemma, Reinforcement Learning, Ensemble Learning, and Clustering.

Teaching Methods

The course is designed as a distance learning course including classroom events. It comprises a series of online lectures, group discussions, obligatory self-study exercises and seminar presentations on a literature study and a case-based learning task.

Examination Methods

Exercises, 1.5 Credits. (Code: 0100)

Examination is done through written assignments.

Seminar Presentation, 1.5 Credits. (Code: 0200)

Examination is done by presentation at a seminar.

Grades

According to the Higher Education Ordinance, Chapter 6, Section 18, a grade is to be awarded on the completion of a course, unless otherwise prescribed by the university. The university may prescribe which grading system shall apply. The grade is to be determined by a teacher specifically appointed by the university (an examiner).

According to regulations on grading systems for first- and second-cycle education (vice-chancellor's decision 2010-10-19, reg. no. CF 12-540/2010), one of the following grades is to be used: fail, pass, or pass with distinction. The vice-chancellor or a person appointed by the vice-chancellor may decide on exceptions from this provision for a specific course, if there are special reasons.

Grades used on course are Fail (U) or Pass (G).

Exercises

Grades used are Fail (U) or Pass (G).

Seminar Presentation

Grades used are Fail (U) or Pass (G).

Other Provisions

23/5000

23/5000

The course is given in English.

No course literature is required.

Reading List and Other Teaching Materials

Required Reading

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