

## Applied Machine Learning (E640600)

**Course size** *(nominal values; actual values may depend on programme)*

**Credits 6.0**

**Study time 180 h**

**Course offerings and teaching methods in academic year 2023-2024**

A (semester 1)	Dutch, English	Kortrijk	lecture
			practical

**Lecturers in academic year 2023-2024**

Van Hoecke, Sofie	TW06	lecturer-in-charge
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**Offered in the following programmes in 2023-2024**

	crdts	offering
<a href="#">Master of Science in Industrial Design Engineering Technology</a>	6	A
<a href="#">Master of Science in Machine and Production Automation Engineering Technology</a>	6	A

**Teaching languages**

English, Dutch

**Keywords**

data mining, data analysis, machine learning, clustering, classification, regression, predictive maintenance

**Position of the course**

The goal of this course is to give students an in-depth knowledge and hands-on experience in machine learning. To do so, an overview is given of the principles, techniques and best-practices in machine learning. The course covers both clustering, classification and regression methods, and the student applies these techniques on real-life data sets, mostly from the domain of predictive maintenance. The data extraction techniques to retrieve these data sets, as well as data cleaning techniques, are also covered. Within the course, guest lecturers will present their machine learning research.

**Contents**

- Introduction
- Data extraction
- Unsupervised methods: Clustering
- Supervised methods: Classification, Regression
- Advanced methods such as Neural Networks, Ensemble techniques, Anomaly detection
- Guest lectures on capita selecta (reinforcement learning/robotics, use cases from industry, ...)

**Initial competences**

Informatics, Software development, Mathematics, Statistics

**Final competences**

- 1 Understands advanced machine learning methods
- 2 Understands the functioning of and choice between supervised and unsupervised systems
- 3 Is able to choose and to use, for a given machine learning problem, the most appropriate method to achieve the defined goals
- 4 A comprehensive knowledge of Python and being able to use this knowledge in real machine learning projects
- 5 The construction and cleaning of datasets

**Conditions for credit contract**

Access to this course unit via a credit contract is determined after successful competences assessment

**Conditions for exam contract**

This course unit cannot be taken via an exam contract

**Teaching methods**

Group work, Lecture, Practical

**Learning materials and price**

Slides on the electronic learning platform

**References**

**Course content-related study coaching**

**Assessment moments**

end-of-term and continuous assessment

**Examination methods in case of periodic assessment during the first examination period**

Written assessment with open-ended questions

**Examination methods in case of periodic assessment during the second examination period**

Written assessment with open-ended questions

**Examination methods in case of permanent assessment**

Participation, Assignment

**Possibilities of retake in case of permanent assessment**

examination during the second examination period is possible in modified form

**Extra information on the examination methods**

Exam is closed book, written exam, open questions

Permanent evaluation: graded on participation, reports for practical assignments and project, and project presentation. The evaluation of the according deliverables is based on the accuracy, completeness, efficiency and critical attitude of the source code and the reports submitted for the practical assignments and the project.

**Calculation of the examination mark**

PGE 50% + NPGE 50%

In order to pass the course, the student must obtain at least 8/20 for the PE (exam) and the NPE (handing in all reports for the practical assignments and project deliverables + project presentation, with at least an average score of 8/20). If this condition is not met, the final score will deviate from the calculated score if 10 or more was obtained and the student will receive score 9/20.