UNIVERSITY OF GOTHENBURG

FACULTY OF ARTS

# LT2306, Machine Learning, 7,5 higher education credits

Maskininlärning, 7.5 högskolepoäng

*Second Cycle*

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## 1. Confirmation

The course syllabus was confirmed by Department of Philosophy, Linguistics and Theory of Science on 2012-10-11 to be valid from 2012-11-05.

*Field of education:* Science 100 %

*Department:* Department of Philosophy, Linguistics and Theory of Science

## 2. Position in the educational system

The course is part of the Master in Language Technology Programme, H2MLT. It can also be offered as a freestanding course.

| *Main field of studies* | *Specialization* |
|---|---|
| Language Technology | A1F, Second cycle, has second-cycle course/s as entry requirements |

## 3. Entry requirements

Passed courses

- LT2113 Natural language processing, and
- LT2202 Statistical Methods

or equivalent language technological skills and knowledge.

## 4. Course content

The purpose of the course is to give a broad introduction to machine learning topics, with special focus on their application in natural language processing. Topics include:

- supervised learning, e.g. perceptrons, support vector machines, logistic regression
- automatic rule induction, e.g. transformation-based learning, inductive logic programming, decision trees
- lightly supervised approaches, e.g. EM, k-means, domain adaptation
- learning theory, e.g. the PAC and VC frameworks
- learning with structure, e.g. conditional random fields, structured perceptron, tree kernels

## 5. Learning outcomes

After completion of the course the student is expected to be able to:

*Knowledge and understanding*

- account for basic notions of machine learning theory and implementation
- give examples of how machine learning methods have been applied in language technology systems

*Skills and abilities*

- apply machine learning techniques to the development of language technology systems
- implement simple machine learning algorithms for classification tasks

*Judgment and approach*

- choose the appropriate machine learning method for a particular task
- evaluate the significance of statistical results

## 6. Literature

Literature will be permanent eight weeks before course start.

## 7. Assessment

There are laboratory assignments as well as a project that must be completed by the student. The examination consists of the submission of reports for the laboratory exercises and for the project.

A student who has failed an examination twice has the right to change examiners if it is feasible. A written application should be sent to the board of the department. Students who have passed an exam may not resit for a higher grade. A student does not have the right to revoke a submitted exam, and thus avoid to be graded.

## 8. Grading scale

The grading scale comprises Fail (U), Pass (G), Pass with Distinction (VG).

Requirements for Pass:

- completed laboratory assignments
- completed project assignment

Requirements for Pass with distinction

- completed laboratory assignments of good quality
- completed a project assignment of good quality

## 9. Course evaluation

## 10. Additional information

Language of instruction: English.