Module MA-INF 4111	**Intelligent Learning and Analysis Systems: Machine Learning**		
Workload 180 h	**Credit points** 6 CP	**Duration** 1 semester	**Frequency** every year
Module coordinator	Prof. Dr. Stefan Wrobel		
Lecturer(s)	Prof. Dr. Stefan Wrobel		
Classification	**Programme** M. Sc. Computer Science	**Mode** Optional	**Semester** 1. or 2.
Technical skills	This module is one of two complementary modules in which students gain an understanding of the most important paradigms and methods of intelligent learning systems as they are used in data analysis and/or for implementing adaptive behaviour (machine learning, data mining, knowledge discovery in databases). This module concentrates on the core task of predictive learning from examples and on agent learning, and teaches the main classes of algorithms for these tasks. At the end of the module, students will be capable of choosing appropriate methods and systems for particular predictive learning applications and use them to arrive at convincing results, and will know where to start whenever adaptation or further development of algorithms and systems is necessary. This module complements MA-INF 4112 and can be taken before or after that module.		
Soft skills	Communicative skills (oral and written presentation of solutions, discussions in small teams), self competences (ability to accept and formulate criticism, ability to analyze problems)		
Contents	Types of learning and analysis tasks, most important non-parametric and parametric methods for supervised learning (e.g., decision trees, rules, linear methods, neural networks, neighbourhood methods, kernel methods, probabilistic approaches), reinforcement learning, evaluation and learning theory.		
Prerequisites	**Recommended:** Prior knowledge of probability theory, linear algebra, artificial intelligence, information systems and data bases **Required**: None of the following modules have been passed: MA-INF 4102 – Intelligent Learning and Analysis Systems		

Format

Teaching format	**Group size**	**h/week**	**Workload[h]**	**CP**
Lecture	60	2	30 T / 45 S	2.5
Exercises	30	2	30 T / 75 S	3.5

T = face-to-face teaching; S = independent study

Exam achievements	Written exam	(graded)
Study achievements	Successful exercise participation	(not graded)
Forms of media	Lectures, exercises, software packages	
Literature	- Tom Mitchell, Machine Learning, McGraw-Hill, 1997 - Ian Witten, Eibe Frank, Data Mining, Morgan Kauffmann, 2000	