

Module MA-INF 4112	Intelligent Learning and Analysis Systems: Data Mining and Knowledge Discovery				
Workload 180 h	Credit points 6 CP	Duration 1 semester	Frequency every year		
Module coordinator	Prof. Dr. Stefan Wrobel				
Lecturer(s)	Prof. Dr. 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 tasks of pattern discovery in databases and teaches the main classes of algorithms for this task (subgroups discovery. At the end of the module, students will be capable of choosing appropriate methods and systems for particular pattern discovery 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 4111 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, scalability techniques, descriptive data mining methods, association rules, subgroups, clustering, pre- and postprocessing, data storage (data warehouses, OLAP), special data types (spatial, network, text, multimedia data), interactive and visual systems.				
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	- Ian Witten, Eibe Frank, Data Mining, Morgan Kauffmann, 2000 - Jiawei Han, Micheline Kamber, Data Mining: Concepts and Techniques, Morgan Kaufmann, 2000				