Module MA-INF 4216	**Data Mining and Machine Learning Methods in Bioinformatics**			
Workload 180 h	**Credit points** 6 CP	**Duration** 1 semester	**Frequency** every year	
Module coordinator	Dr. Holger Fröhlich			
Lecturer(s)	Dr. Holger Fröhlich			
Classification	**Programme** M. Sc. Computer Science	**Mode** Optional	**Semester** 2.	
Technical skills	- understanding and knowledge of fundamental data mining and machine learning methods - understanding of their application in bioinformatics			
Soft skills	- communication: oral and written presentation of solutions to exercises - self-competences: ability to analyze application problems and to formulate possible solutions - practical skills: ability to practically implement solutions - social skills: working in a small team with other students			
Contents	- Introduction: Data Mining and Machine Learning in Bioinformatics - Introduction to Statistics: hypothesis tests, (generalized) linear models, Bayesian inference - Clustering algorithms - Hidden Markov Models - Support Vector Machines For all algorithms the specific context in bioinformatics is discussed (e.g. -omics data and sequence analysis)			
Prerequisites	none			
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				
Literature	T. Hastie, R. Tibshirani, J. Friedman, The Elements of Statistical Learning, Springer, 2008 S.Boslaugh, P. Watters, Statistics in a Nutshell, O'Reilly, 2008 N. Jones, P. Pevzner, An Introduction to Bioinformatics Algorithms, MIT Press, 2004			