Data mining and machine learning (English)

Module Title	Data Mining und maschinelles Lernen
Module Title in English	Data mining and machine learning
Module Leader	Prof. Dr. rer. nat. Jens Allmer
Teaching Staff	Prof. Dr. Jens Allmer
Courselanguage/	English

Code	Workload	Credits	Semester	Semester Offered	Duration
DMML	180 h	6	5th semester	Annually	1 semester

1	Type of Course	Scheduled Learning	Independent Study	Approx. Number of Participants
	Lecture including Exercise: 4 h/week	4 h/week (= 60 h)	Total: 120 h	Lecture including Exercise max. 150 bzw. 120

2 Learning Outcomes / Competences

- Students are able to describe selected machine learning algorithms
- Students are able to discuss different types of machine learning approaches
- Students are able to create and execute basic data analysis workflows
- Students are able to train machine learning models and analyze their results
- Students are able to write an academic report

3 Contents

- Data
  1. Data
  2. Data preprocessing
  3. Analysis workflows
  4. Data analysis
  5. Data visualization
  6. Medical data

- Machine learning I
  1. Supervised learning
  2. Decision trees
  3. Neural networks

- Machine learning II
  1. Unsupervised learning
  2. Self-organizing maps
  3. K-means clustering

- Machine learning III
  1. Sequence analysis

	2. Market basket analysis • Machine learning for medical informatics 1. Current topics 2. Term project
4	**Teaching Methods** Lecture, seminar, integrated practice, and project work
5	**Content-Related Module Prerequisites** none
6	**Formal Module Prerequisites** none
7	**Type of Exams** term paper (3000 words) (80%) Examlanguages: English, German presentation (15 min.) (20%) Examlanguages: English, German
8	**Prerequisite for the Granting of Credits** Passing the modul's exam
9	**This Module Appears in:** **Course of Studies** **Status** Gesundheits- und Medizintechnologien_BPO 2017 Elective Module Gesundheits- und Medizintechnologien_BPO2023 Elective Module
10	**Weighting of Grade in Relationship to Final Grade** Weighting equals the proportion of module credits in relationship to the total number of grade-relevant credits
11	**Additional Information / Literature** Studiengang Gesundheits- und Medizintechnologien: Das Modul ist Bestandteil des Themenfeldes 'Medizininformatik'