

Module Guide

39-M-Inf-VML Advanced Machine Learning

Technische Fakultät

Version dated Dec 5, 2025

This module guide reflects the current state and is subject to change. Up-to-date information and the latest version of this document can be found online via the page

<https://ekvv.uni-bielefeld.de/sinfo/publ/modul/27461580>

The current and valid provisions in the module guide are binding and further specify the subject-related regulations (German "FsB") published in the Official Announcements of Bielefeld University.

39-M-Inf-VML Advanced Machine Learning

Faculty

Technische Fakultät

Person responsible for module

Herr Prof. Dr. Helge Ritter

Regular cycle (beginning)

Discontinued

Credit points

5 Credit points

Competencies

Non-official translation of the module descriptions. Only the German version is legally binding.

Participants learn concepts and methods for structuring and using machine learning methods for more complex tasks. This includes learning architectures, active learning strategies and sequential learning with restrictions, such as delayed success feedback or only partial system observability.

system observability. In addition, the lecture provides an overview of the most important theoretical approaches to machine learning.

theoretical approaches to machine learning and their mutual relationships.

Content of teaching

Building on the module "Neural Networks and Learning", the learning methods considered there are subjected to a more detailed theoretical examination - especially from a statistical point of view. Furthermore, various learning architectures, in particular committee methods and reinforcement learning, are discussed.

Recommended previous knowledge

Competences, such as those acquired in modules 39-Inf-NN Introduction to Neural Networks

Necessary requirements

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Explanation regarding the elements of the module

In some degree programmes, the module (partial) examination can also be "ungraded" at the student's discretion. A corresponding specification must be made before the module is taken; a subsequent change (graded - ungraded) is not possible. If the ungraded option is selected, it is not possible to use this module for a degree programme in which this module is taken into account in the overall grade calculation.

Module structure: 0-1 bPr, 0-1 uPr ¹

Courses

Title	Type	Regular cycle	Workload ⁵	LP ²
Advanced machine learning	exercise	WiSe	30 h (15 + 15)	1 [Pr] [Pr]
Advanced machine learning	lecture	WiSe	60 h (30 + 30)	2

Examinations

Allocated examiner	Type	Weighting	Workload	LP ²
Teaching staff of the course Advanced machine learning (exercise) <i>In some degree programmes of the Faculty of Technology, the module examination can also be "ungraded" at the student's discretion (see explanations of the module elements and the respective subject-specific regulations). If the ungraded option is selected, it is not possible to use this module for a degree programme in which this module is taken into account in the overall grade calculation. See below for explanations of this examination (graded examination option).</i>	Portfolio mit Abschlussprüfung	without grades	60h	2
Teaching staff of the course Advanced machine learning (exercise) <i>Portfolio of exercises that are set during the course (pass mark 50% of the achievable points, individual explanation of the solutions). The exercises in the portfolio are usually handed out weekly. Final oral examination (15-25 min.) on the contents of the lecture and tutorials (in connection with lecture/seminar) or alternatively two board presentations on previously selected exercises.</i>	Portfolio mit Abschlussprüfung	1	60h	2

Further notices

Bei diesem Modul handelt es sich um ein eingestelltes Angebot. Ein entsprechendes Angebot, um dieses Modul abzuschließen, wurde bis maximal Wintersemester 2023/24 vorgehalten.
Bisheriger Angebotsturnus war jedes Wintersemester.

Legend

- 1 The module structure displays the required number of study requirements and examinations.
 - 2 LP is the short form for credit points.
 - 3 The figures in this column are the specialist semesters in which it is recommended to start the module. Depending on the individual study schedule, entirely different courses of study are possible and advisable.
 - 4 Explanations on mandatory option: "Obligation" means: This module is mandatory for the course of the studies; "Optional obligation" means: This module belongs to a number of modules available for selection under certain circumstances. This is more precisely regulated by the "Subject-related regulations" (see navigation).
 - 5 Workload (contact time + self-study)
- SoSe** Summer semester
- WiSe** Winter semester
- SL** study requirement
- Pr** Examination
- bPr** Number of examinations with grades
- uPr** Number of examinations without grades