

Sommersemester 2023

Course	Machine learning (1V, 3S)
Zielgruppe	<p>Master Program: Mechanical Engineering – all programs Automation and Safety - Safe Systems and all programs Maschinenbau, Wirtschaftsingenieurwesen</p> <p>NOTE: Check if this course is really listed in your actual/updated program description</p> <p>Update (April 24th): This course is part of the most ISE ME programs</p> <p>(cf. https://www.uni-due.de/imperia/md/content/zentralverwaltung/verkuendungsblatt_2023/veranz_23_36.pdf).</p>
URL of the course	https://moodle.uni-due.de/course/view.php?id=38682
Lecturer	Univ.-Prof. Dr.-Ing. Dirk Söffker
Assistant	Jonathan Liebeton, M.Sc.
About course	<p>In SoSe 2023, the course will be realized virtually (if someone wishes also partly in person at the university).</p> <p>The realization is carried out via:</p> <ul style="list-style-type: none"> - Lecture material (pdf) - Lecture video material (mp4) - Exercise scripts (using MATHWORKS) GRADER system - Homework to document results obtained for the personalized datasets you have to work on. <p>The commented material (video) will be published during a period of three weeks in advance of the exercise/seminar.</p> <p>In principal learning exclusively with the video material is not recommended, in this case (course ML) this is different. The main focus is with the seminar part, the lecture serves as introduction. So ... feel free to take the introduction using the online material, but do it before the exercise/seminar starts.</p> <p>In case of interest you can also visit the related in person lecture units of the DAP (diagnosis and prognosis) course (LU4, LU5), which are related to data driven diagnostics and prognosis. Most of the LU4 or LU5 serves as the required theoretical ML parts ... with the application to DAP.</p> <p>The core part of the course is based on Mathworks' webinars as well as structured manuscripts for online learning. The main part of the students work is appointment independent, the student can solve the learning and training part according to her/his options. The given appointments are serving as Q/A</p>

	<p>and discussion meeting point with the supervising assistant.</p> <p>The students will also earn Mathworks certificates. If the course is finalized the grading will be automatically realized by Mathworks. NO additional examination.</p> <p>The grading depends on the written final report.</p> <p>The organization allows interested students to attend both courses in parallel and earn deep insights into Fault Detection and Diagnosis and Prognosis methods using Machine Learning as well as the Matlab-based programming skills applying ML.</p>
Material	<p>Moodle: Machine learning– ML https://moodle.uni-due.de/course/view.php?id=38682 The password can be requested via the e-mail address srs-pw@uni-due.de. The subject must contain the word ML.</p>
Day	EVERYDAY, Q/A: Tuesday
Time	3.00 – 7.00 pm
Room	MB 242
First course	<p>May 9th, 2023 (lecture in person if required) June 6th, 2023 (online exercise/seminar parts starts)</p>
Last course	End of the semester, 2023
Literature	Literature is announced in the DAP-related text description
Additional Reading	To be connected with the related lecture material.
Content	<p>The main contents of the course are:</p> <ul style="list-style-type: none"> - Fundamentals of optimization strategies - Application of machine learning models for clustering, classification, and regression - Basic design of intelligent controllers using reinforcement learning - Application of deep learning and implementation of network architectures <p>The data sets used are standard Mathwork data sets, public known data sets (with respect to fault detection and diagnosis tasks), as well as SRS data sets.</p>
Exam	<p>The grade will be realized by evaluation of the written final report. The grade will be forwarded to the examination office in case of exam enrollment. We accept only students with exam enrollment.</p>