

Module Name	Introduction to Machine Learning
Module Number	Eul-ET-E-EML, Eul-IST-E-EML
Responsible Lecturer	Prof. Dr.-Ing. Rafael F. Schaefer rafael.schaefer@tu-dresden.de
Qualification Objectives	After completing the module, students are familiar with and understand fundamental structures, concepts, and algorithms of machine learning and deep learning as well as their typical application areas. They are able to design, train, and validate artificial neural networks for specific problems using current software.
Contents	The module provides an introduction to machine learning. It includes an overview of fundamental structures, concepts, and algorithms of machine learning and deep learning, including application-oriented design, classification, and training methods. This particularly involves the discussion of typical and current challenges and application areas of machine learning, their critical evaluation, and practical experience in designing and training artificial neural networks for various application domains using current software libraries.
Teaching and Learning Forms	2 hours per week of lectures, 2 hours per week of exercises, and self-study. The language of instruction for lectures and exercises may be German or English and will be determined by the lecturer at the beginning of the semester and announced in the usual manner.
Prerequisites for Participation	Basic knowledge of linear algebra and calculus is required, which can be acquired in the modules Introduction to Analysis and Algebra as well as Multidimensional Differential and Integral Calculus. Additionally, basic programming skills, for example in Python, are required.
Usability	The module is an elective module in the elective area "Competence Deepening" according to § 6 paragraph 3 of the study regulations and § 33 paragraph 4 of the examination regulations of the main study program in the field of Information Technology in the diploma program Electrical Engineering. Furthermore, it is an elective module in the elective area "Competence Deepening" according to § 6 paragraph 3 of the study regulations and § 33 paragraph 3 of the examination regulations of the main study program in the field of Communication Technology in the diploma program Information Systems Engineering. The module creates the prerequisites for the modules that list it under "Prerequisites for Participation."
Prerequisites for the Award of Credit Points	Credit points are awarded when the module examination is passed. The module examination consists of a portfolio with a workload of 30 hours.
Credit Points and Grades	5 credit points can be earned through the module. The module grade corresponds to the grade of the examination performance.
Frequency of the Module	The module is offered every summer semester.
Workload	The total workload is 150 hours.
Duration of the Module	The module lasts one semester