

Module Name	Generative Artificial Intelligence
Module Number	Eul-ET-E-GKI, Eul-IST-E-GKI
Responsible Lecturer	Prof. Dr.-Ing. Peter Birkholz peter.birkholz@tu-dresden.de
Qualification Objectives	After completing the module, students will have the knowledge, skills, and abilities to implement, train, and analyze generative AI models.
Contents	The module content includes a brief introduction to machine learning followed by an examination of various generative artificial intelligence models that enable the generation of texts, images, or audio signals. Specifically, the following topics are covered: - Variational Autoencoders - Language Models, such as Large Language Models - Recurrent Neural Networks - Diffusion Models - Generative Adversarial Networks
Teaching and Learning Forms	2 hours per week of lectures, 2 hours per week of practical lab courses, and self-study.
Prerequisites for Participation	In the diploma program in Electrical Engineering, basic knowledge of programming in Python is required, as acquired in the module "Software Engineering Basics." In the diploma program in Information Systems Engineering, no prior knowledge is required.
Usability	The module is an elective module in the elective area "Competence Deepening" according to § 6 paragraph 3 SO and § 33 paragraph 4 PO 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 SO and § 33 paragraph 3 PO of the main study program in the field of Communication Technology in the diploma program Information Systems Engineering. It creates the prerequisites for the modules that list this module in the field "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 written exam lasting 120 minutes. For up to 15 registered students, the written exam will be replaced by a non-public oral examination as an individual exam lasting 25 minutes. If applicable, this will be announced to the registered students at the end of the registration period in the usual manner. A bonus achievement for the written exam or oral examination is a practical performance review with a scope of 15 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.