

Module Name	Coding Theory
Module Number	Eul-ET-E-CodTh, Eul-IST-E-CodTh
Responsible Lecturer	Prof. Dr.-Ing. Rafael F. Schaefer rafael.schaefer@tu-dresden.de
Qualification Objectives	After completing the module, students know and understand the theory of error-detecting and error-correcting codes. They are familiar with various code classes used in channel coding and are able to independently design and analyze practical codes. They master various coding and decoding methods to detect and correct transmission errors.
Contents	The module covers the theory of error-detecting and error-correcting codes, principles, methods, and procedures applied in channel coding, as well as the corresponding mathematical foundations, such as the theory of finite fields. The module includes the description, properties, and coding and decoding of linear block codes, cyclic codes (including RS and BCH codes), convolutional codes, and the discussion of current coding and decoding methods.
Teaching and Learning Forms	3 hours per week of lectures, 1 hour 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 is required, which can be acquired in the module Introduction to Analysis and Algebra
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 written exam lasting 120 minutes.
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 winter semester.
Workload	The total workload is 150 hours.
Duration of the Module	The module lasts one semester.