

Module Name	Network Coding – from Theory to Practice
Module Number	Eul-ET-E-NWCod, Eul-IST-E-NWCod
Responsible Lecturer	Prof. Dr.-Ing. Dr. h.c. F. H. P. Fitzek frank.fitzek@tu-dresden.de
Qualification Objectives	After completing the module, students will acquire the following qualifications: • Students master the combined treatment of coding and routing in networks. • They understand the fundamentals of graph theory for modeling and analyzing networks as well as the central principles of network coding theory and can design network codes for various scenarios. • They are familiar with both classical network coding in wired networks and its extension to wireless networks and are acquainted with current research topics in network coding. • They understand the performance capabilities of network coding systems (NK systems) and are proficient in simulating and implementing NK systems on simple communication systems.
Contents	The module covers the theoretical foundations of network coding (NK) and the evaluation of the performance of NK in practical applications in current and future communication systems.
Teaching and Learning Forms	2 hours per week of lectures, 1 hour per week of exercises, 1 hour per week of practical lab courses, and self-study. The language of instruction for lectures, exercises, and practical lab courses is English.
Prerequisites for Participation	In the diploma program in Electrical Engineering, the competencies to be acquired in the modules Systems Theory, Communication Engineering, Communication Networks, and Information Theory are required. In the diploma program in Information Systems Engineering, the competencies to be acquired in the modules Systems Theory, Communication Engineering, and Information Theory 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 in 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 in 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 if more than 15 students are registered. If up to 15 students are registered, the written exam is replaced by a non-public oral examination as an individual exam lasting 30 minutes. This will be announced to the registered students at the end of the registration period in the usual manner.
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.