

Module Name	Future Communication Networks
Module Number	Eul-ET-E-FCN, Eul-IST-E-FCN, Eul-NES-E-FCN
Responsible Lecturer	Jun.-Prof. Dr.-Ing. Riccardo Bassoli riccardo.bassoli@tu-dresden.de
Qualification Objectives	After completing the module, students possess in-depth knowledge of future communication networks, such as quantum, molecular, and others, as well as their performance evaluation. They are familiar with the processes and protocol structures in future communication networks. Students are capable of gaining an overview of future technologies and their development directions and are acquainted with methods of investigation through prototyping and implementation. They master the most important network technologies, their operating principles, and protocols, can apply these to new problems, and correctly model, analyze, and evaluate the performance of systems.
Contents	The module focuses on future communication networks with selected technologies and protocols, such as quantum, molecular, post-Shannon, and others, as well as routing in communication networks with an in-depth examination of the associated protocols. It also covers methods of prototyping, implementation, and performance evaluation of communication networks. The emphasis is on the investigation and design methods for the functions of the physical and data link layers.
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 acquired in the modules "Communications Engineering" "Communication Networks," and "Advanced Communication Networks" are required. In the diploma program in Information Systems Engineering, the competencies acquired in the modules "Computer Networks" and "Systems Theory" are required. In the Master's program in Nanoelectronic Systems, basic knowledge of communication engineering and communication networks at the Bachelor's level 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. Additionally, it is an elective module according to § 6 paragraph 2 SO and § 33 paragraph 3 PO in the Master's program Nanoelectronic Systems. 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 is replaced by a non-public oral examination as an individual exam lasting 30 minutes. If applicable, 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.
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