

Module Name	Innovative Concepts for Active Nanoelectronic Devices
Module Number	Eul-ET-E-ICAND, Eul-NES-E-ICAND
Responsible Lecturer	Prof. Dr.-Ing. Thomas Mikolajick thomas.mikolajick@tu-dresden.de
Qualification Objectives	After completing the module, students will have the ability to identify material science constraints based on their knowledge of the structure, properties, fabrication, and structural formation of materials, as well as the effects and basic types of small structures in device concepts, applications, and future trends, including bottom-up and top-down nanoelectronics concepts. Furthermore, they will be able to design innovative concepts for active devices and systems in nanoelectronics, understand physical effects and transport mechanisms, and recognize specific implementations of devices currently in use or in the research and development stage, along with their respective technological and electrical constraints.
Contents	The module covers innovative semiconductor devices and materials for nanoelectronics.
Teaching and Learning Forms	4 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 "Physics" and "Microelectronic Technologies and Components" are required. In the Master's program in Nanoelectronic Systems, competencies in the fundamentals of physics, semiconductor electronics, and electronic devices at the Bachelor's level are 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 specialization Microelectronics in the diploma program in Electrical Engineering. Furthermore, it is an elective module according to § 6 paragraph 2 SO and § 33 paragraph 3 PO in the Master's program in 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 and a portfolio with a workload of 40 hours.
Credit Points and Grades	7 credit points can be earned through the module. The module grade is calculated as the weighted average of the grades of the examination components. The written exam is weighted fourfold, and the portfolio is weighted singly.
Frequency of the Module	The module is offered every winter semester.
Workload	The total workload is 210 hours.
Duration of the Module	The module lasts one semester.