

Module Name	Simulation Methodologies in System Design
Module Number	Eul-ET-E-SimGT, Eul-MT-E-SimGT
Responsible Lecturer	Prof. Dr.-Ing. habil. Jens Lienig jens.lienig@tu-dresden.de
Qualification Objectives	After completing the module, students master the fundamentals for a methodologically sound use of finite element method (FEM) systems. They understand the central importance of holistic system simulation within design processes. They are capable of using system simulation in device technology to find robust, cost-effective compromise solutions while considering the omnipresent variations in parameters and functional behavior.
Contents	The module contents include the finite element method with a focus on: - Fundamentals of model creation for various physical domains of device technology, using examples from structural mechanics, heat transfer, and electromagnetic fields - Generalized process steps for creating theoretically sound FEM models Optimization with a focus on: - Methodology of model creation and simulation under the aspect of holistic system simulation in device technology - Model experiments in the design process, i.e., analysis, nominal value optimization, probabilistic and multi-criteria optimization
Teaching and Learning Forms	2 hours per week of lectures, 4 hours per week of exercises, and self-study.
Prerequisites for Participation	The competencies to be acquired in the module "Electronic Systems Design" 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 fields of Device, Micro, and Medical Technology as well as Microelectronics in the diploma program Electrical Engineering. Furthermore, it is an elective module in the elective area "Methods and Applications" according to § 6 paragraph 3 SO and § 33 paragraph 3 PO of the main study program in the diploma program Mechatronics. 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 portfolio with a workload of 90 hours.
Credit Points and Grades	7 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 210 hours.
Duration of the Module	The module lasts one semester.