

Module Name	Functional Materials for Electronics Packaging
Module Number	Eul-ET-E-FMAVT
Responsible Lecturer	Prof. Dr.-Ing. Juliana Panchenko juliana.panchenko@tu-dresden.de
Qualification Objectives	After completing the module, students are familiar with the material properties, methods for parameter determination and evaluation, as well as their influence on the long-term reliability of electronic products. They are able to scientifically select materials and technologies for product design.
Contents	The module covers the most commonly used materials and the reliability of packaging and interconnection technology (AVT) with micro-/nanomaterials for contact systems, load scenarios for electronic assemblies, the microstructural composition of materials, alloys and their intermetallic phases and transformations, the physical causes of functional failure, as well as elastic and plastic deformation and time-dependent processes, material physics, damage modeling, and characterization methods. Additionally, it includes the reliability of electronic assemblies in AVT, the design of reliability during product development, requirements for electronic components and auxiliary materials, process reliability in the manufacturing process of electronic assemblies (First Pass Yield), proof of functionality and technical reliability (Board Level Reliability) at the product level, selected packaging and material technology requirements for highly integrated components, as well as selected damage mechanisms of electronic assemblies and their transformation to field conditions.
Teaching and Learning Forms	4 hours per week of lectures, 1 hour per week of practical exercises, and self-study. The language of instruction for lectures and practical exercises can be either 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	The competencies to be acquired in the modules Electronics Technology Lab and Electronic Technologies are required.
Usability	The module is an elective module from the elective area "Competence Deepening" according to § 6 Paragraph 3 SO and § 33 Paragraph 4 PO of the main study program in the specialization "Devices, Micro- and Medical Technology" in the diploma program Electrical Engineering. 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 an ungraded complex assignment with a workload of 14 hours.
Credit Points and Grades	7 credit points can be earned through the module. The module grade is determined in accordance with § 15 Paragraph 1 Sentences 5 and 6 PO from the unweighted average of the examination performances.
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.