

Module title		Abbreviation
Scanning Probe Technologies		11-SPT-211-m01
Module coordinator		Module offered by
Managing Director of the Institute of Applied Physics		Faculty of Physics and Astronomy
ECTS	Method of grading	Only after succ. compl. of module(s)
6	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	graduate	--
Contents		
Basic theoretical principles of scanning force, tunneling, and near-field optical microscopy; basic principles of surface science; tip-sample interactions; design principles and material considerations; fundamentals of control engineering; measurement modes, e.g., contact and non-contact, Kelvin probe, friction force microscopy, etc; basic principles of processing and presenting microcopy data; measurement techniques and their application: lock-in, phase-lock loop, etc.		
Intended learning outcomes		
Student acquires specific knowledge in scanning probe microscopy. He/she knows the basic theoretical principles, is aware of basic design principles, knows pros and cons of various materials, and is familiar of measurement modes, contrast mechanisms, and their application. He/she is aware of recent development in the field.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (3) + R (1) Module taught in: German or English		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Language of assessment: German and/or English Assessment offered: In the semester in which the course is offered and in the subsequent semester		
Allocation of places		
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Additional information		
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Workload		
180 h		
Teaching cycle		
Teaching cycle: annually, after announcement		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Master's degree (1 major) Nanostructure Technology (2020) Master's degree (1 major) Physics (2020)		

Master's degree (1 major) Quantum Technology (2021)
exchange program Physics (2023)