## Module description

Module title					Abbreviation
Overview Linear Algebra for Mathematical Physics					10-M-LNP-Ü-202-m01
Module coordinator				Module offered by	
Dean of Studies Mathematik (Mathemati			atics)	Institute of Mathematics	
ECTS Method of grading		Only after succ. compl. of module(s)			
16 numerical grade					
Duration		Module level	Other prerequisites		
2 semester 🛛 ur		undergraduate			
Contents					
Basic notions and structures: groups, rings, fields, polynomials;matrices: Gauß algorithm, echolon form, rank; vector spaces over arbitrary fields: linear independance, basis, dimension, coordinates, change of basis, sums, direct sums and quotients of subspaces, linear maps, kernel and image, dimension theorem, matrix represen- tation, determinants. Eigenvalue theory: characteristic polynomial, Caley-Hamilton theorem, minimal polynomi- al, invariant subspaces, diagonalisability, nilpotent maps, Jordan normal form; Euclidean/unitary spaces: scalar product, orthonormal bases, orthogonal complement, ortogonal/unitary matrices, selfadjoint and normal matri- ces, positive definit matrices.					
Intended learning outcomes					
The student knows and masters the essential methods and proof techniques of linear algebra and is able to ap- ply them independently. He/She has an overview over the fundamental notions and methods of linear algebra, knows about their algebraic and geometric background, is able to relate them to each other and can present them adequately in written and oral form.					
Courses (type, number of weekly contact hours, language — if other than German)					
V(4) + V(4) + U(2)					
<b>Method of assessment</b> (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)					
oral examination of one candidate each (20 to 40 minutes) Assessment will have reference to the contents of modules 10-M-LNAP1 and 10-M-LNP-Ü. Language of assessment: German and/or English					
Allocation of places					
Additional information					
Workload					
480 h					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in					
Bachelor's degree (1 major) Mathematical Physics (2020) Bachelor's degree (1 major) Mathematical Physics (2024)					

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