

Module title		Abbreviation
Overview Linear Algebra for Mathematical Physics		10-M-LNP-Ü-202-m01
Module coordinator		Module offered by
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics
ECTS	Method of grading	Only after succ. compl. of module(s)
16	numerical grade	--
Duration	Module level	Other prerequisites
2 semester	undergraduate	--
Contents		
<p>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 representation, determinants. Eigenvalue theory: characteristic polynomial, Caley-Hamilton theorem, minimal polynomial, invariant subspaces, diagonalisability, nilpotent maps, Jordan normal form; Euclidean/unitary spaces: scalar product, orthonormal bases, orthogonal complement, ortogonal/unitary matrices, selfadjoint and normal matrices, positive definit matrices.</p>		
Intended learning outcomes		
<p>The student knows and masters the essential methods and proof techniques of linear algebra and is able to apply 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.</p>		
Courses (type, number of weekly contact hours, language — if other than German)		
V (4) + V (4) + Ü (2)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
<p>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</p>		
Allocation of places		
--		
Additional information		
--		
Workload		
480 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
--		
Module appears in		
<p>Bachelor' degree (1 major) Mathematical Physics (2020) Bachelor' degree (1 major) Mathematical Physics (2024)</p>		