Module description: Linear Algebra

Module Code	t.BA.ITM.LA.19HS
ECTS Credits	4
Language of Instruction/Examination	German
Organizational Unit	IAMP
Module Coordinator	Monika Ulrike Reif
Legal Framework	The module description is part of the legal basis in addition to the general academic regulations. It is binding. During the first week of the semester a written and communicated supplement can specify the module description in more detail.
Module Characteristic	Type 2b 2 times 2 lecture lessons (not necessarily consecutive) per semester week and class
Module Description	The module teaches the basics of linear algebra. Among other things, you will learn how to work with linear systems of equations, vectors and matrices.
Module Content	**Linear systems of equations:** • Solvability criteria • Solution method (Gauss-method, Gauss-Jordan method) **Vector calculus** • Arithmetic operations • Vectors in plane and space • Analytical geometry of straight lines and planes **Matrix calculation** • Special matrices • Arithmetic operations • Inverse Matrix • Determinant **Vector spaces:** • General vector spaces and subspaces • Linear independence, basis, dimension **Linear transforamation** • Linear transformation and matrices • Dimension theorem
Prerequisite Knowledge	Knowledge of the mathematics of the technical vocational baccalaureate Knowledge of discrete mathematics

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Learning Objectives (Competences)	Students...	Competencies	Taxonomies
	You know algorithms for solving linear systems of equations and apply them.	F, M	K2, K3
	You know the abstract concept of a vector space and its description (sub)vector space, basis, dimension, generating system, linear (un)dependency.	M, F	K2, K3
	You are familiar with the matrix calculation and can apply it.	M, F	K2, K3
	You understand the relation between linear transformation and the matrix calculus.	M, F	K2, K3
	You can check linear equation systems for their (unambiguous) solvability.	F, M	K3
	You are familiar with the basic arithmetic operations of vector geometry	M, F	K2, K3

Performance Assessment	End-of-module exam	Assessment	Length (min.)	Weighting	Form
	written exam	Grade	90	90	acc. to module agreement

	Performance assessment during the semester	Assessment	Length (min.)	Weighting	Form
	Weekly short tests	Grade	60	10	acc. to module agreement

Classroom Attendance Requirement	None
Learning material	• Teschl, G. & Teschl, S. Mathematik für Informatiker; Band 1: Diskrete Mathematik und Lineare Algebra. ISBN 978-3-642-37972-7. • Lecture Notes
Comments	