Module code (1.)	Module description (2.)		Category (3.)
MBI 1530 Stand: 06.10.2021	Numerics		Int. Master
	Degree program (4.)	Sustainable Engineering of Infrastructure	
	Faculty (5.)	Civil Engineering and Conservation / Restoration	

Module supervisor (6.)	Prof. Dr.-Ing. Fritz D. Vogdt
Type of module (7.)	P (obligatory)
Frequency (8.)	Annually
Standard semester of study (9.)	2nd semester
Credits (ECTS) (10.)	5 ETCS
Assessment (11.)	SL (practical work with report)
Language of instruction (12.)	English
Admission requirements (13.)	-
Module is a requirement for (14.)	-
Module duration (15.)	1 semester
Mandatory registration (16.)	
Applicability of module (17.)	Civil Engineering

Course (18.)		Lecturer (19.)	Type (20.)	No. of students (max.) (21.)	No. of courses per week (22.)	Contact hours per week (23.)	Workload	
							Face-to-face (24.)	Self-study (25.)
1	Numerics	F.D. Vogdt	Seminar	25	1	4	60	90
					Total	**4**	**60**	**90**
					Workload for the module (26.)			**150**

Learning objectives (27.)	After successful participation in the module, students have knowledge of computer-aided numerical methods for the simulation of problems in structural mechanics as well as the ability to select and apply specific software.
Course contents (28.)	The following topics will be covered in the module: • systems of linear equations • eigenvalue problems • finite-difference method for the solution of boundary value problems • finite element theory of deformations, stresses, strength and fracture • systems of linear equations • numerical interpolation, differentiation and integration

Preliminary exam requirements and assessment (29.)	• Term paper and presentation
Literature (30.)	• Hermann Friedrich und Frank Pietschmann: Numerische Methoden: Ein Lehr- und Übungsbuch, De Gruyter, 2010 • Klaus-Jürgen Bathe: Finite-Elemente-Methoden, Springer, 2002 • Klaus Knothe, Heribert Wessels: Finite Elemente: Eine Einführung für Ingenieure, Springer, 4. Aufl. 2008 • User manuals, brief instructions and ample applications from software manufacturers