Title	Modelling of Steel Structures and Numerical Simulation	
Semester (optional)	2 or 4	
Frequency	Once a year in the summer semester, At least 5 participants	
Interval and duration	Weekly for 1 semester	
ECTS / credit points	6 ECTS / 4 SWS	
Workload	In-class study / online-study	45
	Self-study	105
	Exam preparation	30
Language of instruction	English	
Module coordinator(s)	Prof. Dr.-Ing. Kraus, Matthias – Chair of Steel and Hybrid Structures	
Usability / Type of module	Compulsory elective module in the subject area "Simulation and Validation" for the degree programme M.Sc. Digital Engineering Compulsory elective module for the degree programme M.Sc. Natural Hazards and Risks in Structural Engineering	
Formal requirements for participation		
Recommended requirements for participation	Mechanics	
Required examination (including partial exams if applicable)	Type	Written exam
	Requirements for exam registration	
	Language	English
	Duration / Scope	120 min.
	Weighting	Written exam (100 %)
Target qualifications	The students will be familiar with skills and expertise in the field of nonlinear structural analyses. Extensive knowledge of theoretical basics and modern modelling methods including numerical representations are the aim of the course. The students will acquire skills in handling advanced tools for the analysis and the design of structures.	
Content	Design of steel structures using finite element methods; basics of the design; modelling of structures and loads; nonlinear material behaviour, numerical analyses of steel-members and structures regarding geometric and physical nonlinearities; stability behaviour of members including flexural and lateral torsional buckling	
Teaching and learning forms/ Didactic concept	Lectures, exercises in lecture hall, exercises in computer pool, self-study Lectures provide the theoretical background, which is exemplarily applied to practical tasks in exercises including computer applications.	
Literature and special information	Literature: Kindmann, R., Kraus, M.: Steel Structures – Design using FEM. Ernst & Sohn publishing, Berlin 2011 Internal lecture notes	
Courses with SWS / ECTS	This module is comprised of: "Modelling of steel structures and numerical simulation" (Lecture, 2 SWS) "Modelling of steel structures and numerical simulation" (Exercise, 2 SWS)	