	HTWK Leipzig, Leipzig University of Applied Sciences			
	Module Course code	**Nonlinear Optimization** **nOp** (AMB8020)		
	Semester	**Summer semester**		
	ECTS, level	**5 points, Bachelor's in Math. / Master's in Engineering**		
	Language of instruction	**English**		
	Teaching staff	**Prof. Dr. rer. nat. habil. Jochen Merker**		
Prerequisites	Basics of mathematics			
Learning outcomes	The students know the basics of nonlinear optimization, particularly they know methods how to find minimizers of nonlinear functions with finitely many variables in the unrestricted and restricted case. Using this knowledge, they are able to solve applications from engineering and management like e.g. parameter estimation and optimal control problems. The students have developed a working knowledge of nonlinear optimization, i.e., they have developed the skills and background needed to recognize, formulate, and solve specific classes of nonlinear optimization problems which occur in applications.			
Course contents	- Introduction (Examples, Problem classes, Convexity) - Least Squares - Unrestricted optimization - Optimization with linear or convex restrictions			
Workload	150 hours, of which 56 hours attendance (14 weeks x 4 hours)			
Pre-examination requirements	Exercises			
Mode of instruction and assessment	**Lecture**	**Seminar**	**Laboratory Course**	**Assessment**
	2 hours per week	2 hours per week		Oral examination
Recommended reading	BOYD, Stephen; VANDENBERGHE, Lieven: *Convex Optimization*, Cambridge University Press BECK, Amir: *Introduction to Nonlinear Optimization*, SIAM BORWEIN, Jonathan M.; LEWIS, Adrian S.: *Convex Analysis and Nonlinear Optimization*, Springer			