Module MA-INF 1202	**Chip Design**				
Workload 270 h	**Credit points** 9 CP	**Duration** 1 semester	**Frequency** every year		
Module coordinator	Prof. Dr. Jens Vygen				
Lecturer(s)	All lecturers of Discrete Mathematics				
Classification	**Programme** M. Sc. Computer Science		**Mode** Optional	**Semester** 1. or 2.	
Technical skills	Knowledge of the central problems and algorithms in chip design. Competence to develop and apply algorithms for solving real-world problems, also with respect to technical constraints. Techniques to develop and implement efficient algorithms for very large instances.				
Soft skills	Mathematical modelling of problems occurring in chip design, development of efficient algorithms, abstract thinking, presentation of solutions to exercises				
Contents	Problem formulation and design flow for chip design, logic synthesis, placement, routing, timing analysis and optimization, clocktree design				
Prerequisites	none				
Format	**Teaching format**	**Group size**	**h/week**	**Workload[h]**	**CP**
	Lecture	60	4	60 T / 105 S	5.5
	Exercises	30	2	30 T / 75 S	3.5
	T = face-to-face teaching; S = independent study				
Exam achievements	Oral exam (graded)				
Study achievements	Successful exercise participation (not graded)				
Forms of media					
Literature	• C.J. Alpert, D.P. Mehta, S.S. Sapatnekar: The Handbook of Algorithms for VLSI Physical Design Automation. CRC Press, New York, 2008. • S. Held, B. Korte, D. Rautenbach, J. Vygen: Combinatorial optimization in VLSI design. In: "Combinatorial Optimization: Methods and Applications" (V. Chvátal, ed.), IOS Press, Amsterdam 2011, pp. 33-96 • J. Vygen: Chip Design. Lecture Notes (distributed during the course)				