

Module MA-INF 1213	Randomized Algorithms and Probabilistic Analysis				
Workload 270 h	Credit points 9 CP	Duration 1 semester	Frequency every year		
Module coordinator	Prof. Dr. Heiko Röglin				
Lecturer(s)	Prof. Dr. Heiko Röglin				
Classification	Programme M. Sc. Computer Science		Mode Optional	Semester 2. or 4.	
Technical skills	understanding of models and techniques for the probabilistic analysis of algorithms as well as for the design and analysis of randomized algorithms				
Soft skills	oral and written presentation of solutions and methods, abstract thinking				
Contents	design and analysis of randomized algorithms <ul style="list-style-type: none">• complexity classes• Markov chains and random walks• tail inequalities• probabilistic method smoothed and average-case analysis <ul style="list-style-type: none">• simplex algorithm• local search algorithms• clustering algorithms• combinatorial optimization problems• multi-objective optimization				
Prerequisites	Required: None of the following modules have been passed: MA-INF 1210 – Probabilistic Analysis of Algorithms				
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	<ul style="list-style-type: none">• lecture notes• research articles• Motwani, Raghavan: Randomized Algorithms• Mitzenmacher, Upfal: Probability and Computing				