Module MA-INF 1203	**Discrete and Computational Geometry**			
Workload 270 h	**Credit points** 9 CP	**Duration** 1 semester	**Frequency** every year	
Module coordinator	Prof. Dr. Rolf Klein			
Lecturer(s)	Prof. Dr. Rolf Klein, Prof. Dr. Norbert Blum, Prof. Dr. Marek Karpinski, PD Dr. Elmar Langetepe			
Classification	**Programme** M. Sc. Computer Science	**Mode** Optional	**Semester** 1., 2., 3. or 4.	
Technical skills	To acquire fundamental knowledge on topics and methods in Discrete and Computational Geometry; to gain experience in, and practice, applying this knowledge autonomously in solving new problems, aiming at reliable experience.			
Soft skills	Sozialkompetenz (Kommunikationsfähigkeit, Präsentation eigener Lösungsansätze und zielorientierte Diskussion im Gruppenrahmen, Teamfähigkeit), Methodenkompetenz (Analysefähigkeit, Abstraktes Denken, Führen von Beweisen), Individualkompetenz (Leistungs- und Lernbereitschaft, Kreativität, Ausdauer). Social competence(communication, presenting one's own solutions, goal-oriented discussions in teams), methodical competence (analysis, abstraction, proofs), individual competence (commitment and willingness to learn,creativity, endurance).			
Contents	Geometric distance problems in dimension two and higher, Voronoi diagrams, well-separated pair decomposition, spanner, metric space embedding, dimension reduction, dilation, geometric inequalities, VC-dimension, epsilon-nets, visibility, point location; randomized incremental construction, Chan's technique.			
Prerequisites	**Recommended:** BA-INF 114 – Grundlagen der algorithmischen Geometrie			

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	• Matousek, Lectures on Discrete Geometry • Narasimhan/Smid, Geometric Spanner Networks • Klein, Concrete and Abstract Voronoi Diagrams	