Module MA-INF 3318	**Seminar Verification of Complex Systems**		
Workload 120 h	**Credit points** 4 CP	**Duration** 1 semester	**Frequency** at least every 2 years
Module coordinator	Jun.-Prof. Dr. Janis Voigtländer		
Lecturer(s)	Jun.-Prof. Dr. Janis Voigtländer		
Classification	**Programme** M. Sc. Computer Science	**Mode** Optional	**Semester** 2. or 3.
Technical skills	Knowledge in topics in the area of specifying and verifying behaviour of complex systems such as software. Competence to mine for profound knowledge about a given subject, in particular acquiring and studying original literature. Understanding scientific publications, often written tersely. Distilling this into suitable presentations; determination of relevant vs. irrelevant material. Presenting research results to others, in writing and in oral presentations, and discussing them with an audience. Ability to discuss and evaluate presentations of fellow students, and to constructively deal with critical feedback by others.		
Soft skills	Communication skills (preparing and presenting talks, using visual media, preparing a structured written document), social skills (motivating other students, ability to accept and formulate criticism), self competences (time management with long-ranging deadlines, self-study, ability to analyse, creativity).		
Contents	Techniques for analyzing the correctness of complex systems such as software. Theoretical foundations for such techniques, as well as consideration of practical tools. Spectrum ranging from formal to semi-formal; positioning of techniques within this spectrum. Specific themes of interest include: • Specification formalisms and languages • Decision problems • Modelling desired properties of a system • Model checking • Theorem proving • Static (flow) analysis, abstract interpretation • Code analysis using heuristics • Testing (approaches, frameworks, coverage criteria) • Runtime verification (instrumentation, monitoring) • Applications and pragmatics of verification A selection of topics will be made in each semester.		
Prerequisites	none		
Format	**Teaching format** / **Group size** / **h/week** / **Workload[h]** / **CP** Seminar / 10 / 2 / 30 T / 90 S / 4 T = face-to-face teaching; S = independent study		
Exam achievements	Oral presentation, written report (graded)		
Study achievements	none (not graded)		
Forms of media			
Literature	The relevant literature will be announced in time.		