

Module title		Abbreviation
Virtual Prototyping of Embedded Systems		10-I=VPES-232-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	graduate	--
Contents		
<p>Today's companies have to deal with complex hardware architectures such as heterogeneous multi-core systems. Therefore, new development tools and approaches such as virtual prototyping are needed for efficient and fast design on electronic system level. In our research, we use SystemC and gem5 based virtual platforms for a thorough design space exploration on software and hardware level.</p> <ul style="list-style-type: none"> • Introduction to virtual prototyping and virtual product development methodology for embedded systems • • System models and specification • Hardware/Software co-development with virtual prototyping • Modelling with cycle accurate SystemC • Modelling on higher level of abstraction with Transaction Level Modeling (TLM) • Modelling of embedded processors with gem5 • Design space exploration for embedded systems with virtual prototypes 		
Intended learning outcomes		
<ul style="list-style-type: none"> • Understanding advantages of novel virtual product development • Finding the right level of abstraction for a specific problem • Develop a feeling for the tradeoff between accuracy and simulation speed • ◦ Hardware/Software co-development ◦ Design space exploration 		
Courses (type, number of weekly contact hours, language – if other than German)		
V (2) + Ü (2) Module taught in: German and/or English		
Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)		
<p>written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus</p>		
Allocation of places		
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Additional information		
Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): ES		
Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Computer Science (2023)