

Modul INF-BSc-273: Fachprojekt „Design of Embedded Systems“					
Englischer Modultitel: Undergraduate Project „Design of Embedded Systems“					
Studiengänge: Bachelorstudiengang Informatik , Bachelorstudiengang Angewandte Informatik					
Turnus / Rota nach Ankündigung (to be announced)	Dauer 1 Semester	Studienabschnitt: 6. Semester	Credits 7 ¹	Aufwand 210 (60/150)	
1	Modulstruktur				
	Nr.	Element / Lehrveranstaltung	Typ	Credits	SWS
	1	Fachprojekt „Design of Embedded Systems“	Projekt	7	4
2	Lehrveranstaltungssprache: englisch				
3	Lehrinhalte / Content				
	<p>This module offers the students exemplary designs and implementations of embedded systems. The detailed subjects change over time. Currently, the following subjects are offered:</p> <p><i>Programming and resource management for mobile/small devices:</i> Mobile/small devices have special requirements in the usage of resources. This project will use embedded platforms, such as Raspberry Pi, Arduino, etc. Students will learn how to install and customize an embedded real-time operating system on such mobile/small platforms and manage the available resources to improve the performance or lifetime of the system.</p> <p><i>Design and evaluation of multicore embedded systems:</i> Some embedded systems require high performance under energy budgets. This has motivated multicore embedded platforms such as big.LITTLE architecture by ARM. This project offers students to explore such platforms and design software and management strategies to use the resources effectively.</p> <p><i>Software modularization and programming for cyber-physical systems (CPS):</i> This offers a project for students to consider the hardware-in-the-loop CPS, such as robots. The students should create and implement a demonstrated CPS. Students learn an example of how A/D converts, information processing, D/A converts, and communications should be designed to make the system behavior predictable.</p> <p><i>Model-based design for embedded systems:</i> In this case, we will study how to design an embedded system by using model-based designs. The benefit for such designs is that the programs generated by the models are easier to be analyzed and integrated. Students will learn different formal models of computation for designing embedded systems.</p>				
4	Kompetenzen / Goals				
	<p>After attending the project, the students can build their confidence and experience for designing complex embedded systems from themselves. They should be able to apply programming languages (depending on the projects), formal models, and tools to implement the design. This project can improve their competence to integrate software and hardware components.</p>				
5	Prüfungen / Examination Requirements				
	<p><i>Voraussetzungen für den Modulabschluss:</i>²</p> <p>(1) Abschlusspräsentation (Project presentation) ^{BOSS-NR. 88692}</p> <p>(2) Erfolgreiches Design und Bearbeitung der gestellten Aufgaben (Successful design and implementation of the offered subject) ^{BOSS-NR. -keine-}</p> <p>Die Voraussetzung (2) ist vor der Voraussetzung (1) zu erbringen.</p>				
6	Prüfungsformen und -leistungen				
	<input checked="" type="checkbox"/> Modulprüfung <input type="checkbox"/> Teilleistungen				
7	Teilnahmevoraussetzungen				
	<p><i>Erfolgreich abgeschlossen:</i> Modul „Rechnerstrukturen (RS)“</p> <p><i>Wünschenswerte Kenntnisse:</i> Modul „Hardware-Praktikum (HaPra)“ (oder Modul „Hardware-</p>				

¹ 6 Leistungspunkte vor dem Wintersemester 2019/20

² vor dem Wintersemester unbenotete Modulprüfung und Studienleistung

	Praktikum (HaPra) für Studierende mit Nebenfach Elektrotechnik ¹), Modul „Elektrotechnik und Kommunikationstechnik“ ¹ oder Modul „Grundlagen der Elektrotechnik“ bei Nebenfach Elektrotechnik		
8	Modultyp und Verwendbarkeit des Moduls Wahlpflicht-Modul im Bachelor-Studiengang Informatik und Angewandte Informatik Fachprojekt		
9	Modulbeauftragte/r Prof. Dr. J.-J. Chen	Zuständige Fakultät Informatik	Beschluss Fakultätsrat 18.05.2016 Änderung Fakultätsrat 22.05.2019

¹ oder Modul „Elektrotechnik und Nachrichtentechnik“