Hochschule München University of Applied Sciences

Courses in English
Course Description

Department	07 Computer Science and Mathematics
Course title	**Hardware Design for Software Developers**
Course number	
Hours per week (SWS)	4
Number of ECTS credits	5
Course objective	Students assess the necessity of using programmable hardware - Students combine software and hardware components and justify their use for a specific system - Students evaluate the key performance indicators of a system - Students develop their own hardware components to accelerate software - Students develop projects in teams
Prerequisites	Technical Computer Science, Computer Architecture
Recommended reading	- Peter Sauer, Hardware-Design mit FPGA: eine Einführung in den Schaltungsentwurf mit FPGA-Bausteinen, 2010 - Vincent Himpe, Digitale Logik selbst entwickeln: von 0 und 1 zum FPGA, 2012 - Elias Cord, FPGAs für Maker :eine praktische Einführung in programmierbare Logik, 2016 - Aktuelle Online-Quellen
Teaching methods	
Assessment methods	
Language of instruction	English
Name of lecturer	Prof. Stefan Wallentowitz
Email	stefan.wallentowitz@hm.edu
Link	
Course content	The development of special hardware components (integrated circuits) is very complex and costly. Field Programmable Gate Arrays (FPGA) offer a powerful alternative and are becoming increasingly popular in industrial applications (e.g. driver assistance systems, machine learning) and the maker environment. The development of custom hardware components to accelerate software applications is more accessible than ever before, especially thanks to components that contain programmable processors and programmable logic (embedded FPGA) at the same time. This course covers the following topics, among others: - Basics of hardware development and chip production - classic and new hardware description languages - Function and structure of the Field Programmable Gate Array and its programmingFunktion und Aufbau der Field Programmable Gate Array und deren Programmierung - Development and connection of hardware accelerators for software projects - Gemeinsamer Entwurf von Hardware und Software (Hardware/Software-Codesign)
Remarks	