

Module Description ME_402 Microprocessor Technology

Last update:
November 7, 2016

Degree: Bachelor of Engineering

1	module no. ME 402	degree programme ATB/ETB/FTB	semester 4	starts in <input checked="" type="checkbox"/> WS <input checked="" type="checkbox"/> SS	duration 1 Semester	module type mandatory	workload (h) 150	ECTS Credits 5
2	Klicken Sie hier, um Text einzugeben. a) Microprocessor Technology b) Microprocessor Technology laboratory		type of instruction lectures with practice laboratory		language english english	contact time (SWS) (h) 3 40 2 20	self-study (h) 50 40	ECTS Credits 3 2
3	table of qualifications knowledge & understanding applying knowledge & understanding analysing & judging acquiring & broadening		expertise <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>		methodological skills <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>		personal & social skills <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
4	learning outcome and competences knowledge & understanding The students <ul style="list-style-type: none"> know the structure and programming of commercially available microcontrollers using the example of a 32 bit microcontroller. know the hardware-related programming especially the use of bit-variables and registers. applying skills The students <ul style="list-style-type: none"> are capable of programming microcontrollers in the programming language C. are capable of looking for solutions of given exercises when working in teams. are capable of knowing the fields of application of microcontrollers. The students have gained methodological skills to independently acquire knowledge in the field of microprocessor technology from the sources/documents delivered by the manufacturers. analysing and judging <ul style="list-style-type: none"> They are capable of knowing the application possibilities of microcontrollers. They are capable of analyzing problems incurred with microcontrollers and of working out methods of finding appropriate solutions. acquiring and broadening skills <ul style="list-style-type: none"> 							

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5	<p>content</p> <p>a)</p> <ul style="list-style-type: none"> • structure, functioning and programming of microcontrollers being commercially available on the example of an LPC1769 produced by NXP based on the 32-bit CortexM3 • The students gain basic knowledge of the structure and the operation mode of embedded microcontrollers based on ARM-CortexM3-series. • They are capable of developing, programming and using microcontroller applications. • They apply the professional development software by Arm/Keil and learn programming in C. • The students learn the application of the most used peripheral modules (GPIO-Ports, A/D-converter, D/A-converter/ complex timer modules and simple interfaces (SPI/I2C). <p>b) tests:</p> <p>writing and reading of digital signals with GPIO Ports using a LCD to display characters in an application interrupt technology for internal or external sources/signals analog/ digital and digital/ analog conversion signal generation and measurements with built-in timer units of microcontrollers application of simple communication interfaces (SPI/IEC)</p>
6	<p>Prerequisites According to the study and examination regulation : none</p> <p>Recommended: digital technology (TTL, CMOS technologies, A/D-converter, circuit networks, switch gears, meters, storage elements), basics of C-programming, calculating with hexadecimal and binary number systems</p>
7	<p>Type of assessment and requirements for credits</p> <p>a) written exam b) successful solving of the laboratory tasks working in team</p> <p>A grade is given for the whole module. The grade is subject to the result of the written exam. All parts of the module have to be passed.</p>
8	<p>Use of the module Mandatory module in the bachelor study course ATB, ETB, FTB</p>
9	<p>Module director and other lecturers involved Prof.-Dr.-Ing. Wolfgang Krichel, Prof.-Dr.-Ing. Bernhard Beetz</p>
10	<p>Literature Data book: User-Manual LPC176x/5x, User manual UM10360, http://www.nxp.com (http://www.nxp.com/documents/user_manual/UM10360.pdf) Lecture script of microprocessor technology of Esslingen University of Applied Sciences laboratory instructions of microprocessor technology of Esslingen University of Applied Sciences Yiu, J.: The Definitive Guide to the ARM Cortex-M3; Newnes-Verlag, 2007 http://www.arm.com/products/processors/cortex-m/cortex-m3.php</p>
11	<p>Contribution to the educational aims of the degree programme Gaining specific mechatronical basics in the subject of microprocessor technology .</p>
12	<p>Last update: 07.11.2016</p>