

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Basics of microprocessor engineering</b>		Code <b>1010331531010332695</b>
Field of study <b>Information Engineering</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>2 / 3</b>
Elective path/specialty <b>-</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>30</b> Classes: <b>-</b> Laboratory: <b>30</b> Project/seminars: <b>-</b>		No. of credits <b>4</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art		ECTS distribution (number and %)
<b>Responsible for subject / lecturer:</b> dr inż. Dominik Belter email: dominik.belter@put.poznan.pl tel. 61 665 2809 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań		<b>Responsible for subject / lecturer:</b> dr inż. Dominik Belter email: dominik.belter@put.poznan.pl tel. 61 665 2809 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Student has structured and theoretically founded knowledge of the basic algorithms and math for physics, electronic circuits.
2	<b>Skills</b>	Student is able to use programming environments and platforms to write, perform and test simple programs for microcontrollers.
3	<b>Social competencies</b>	Student is aware of and understands the importance and impact of non-technical aspects of engineering activity and the associated responsibility for decisions.
<b>Assumptions and objectives of the course:</b> Description of the concepts that underlie microcontrollers with examples that pertain to the most popular ones, including: STM32, ATmega, PIC, 8051.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Knowledge about architecture and most common modules of microcontrollers - [K_W02 ++, K_W03 +++]		
2. Knowledge about programming of microcontrollers and design of embedded systems - [K_W16 +++]		
<b>Skills:</b>		
1. Ability to apply the knowledge about structure and modules of microcontrollers - [K_U08 ++, K_U19 +]		
2. Skills and abilities to acquire new knowledge about microcontrollers - [K_U01 +++, K_U03 +]		
<b>Social competencies:</b>		
1. Ability to come commercialize solutions from embedded systems - [K-K01 ++, K_K02 +]		
<b>Assessment methods of study outcomes</b>		
Lectures: written tests, pass criterion of 50.1% points.		
Laboratory: tests, evaluation of completed projects and reports		
<b>Course description</b>		

Lecture: uC architectures, digital and analog input and outputs, USART, SPI, I2C, 1-wire, RS-232, RS-485, digital to analog converters, analog to digital converters, USB, SD cards		
Laboratory: digital and analog input and outputs, USART, SPI, I2C, 1-wire, RS-232, RS-485, digital to analog converters, analog to digital converters, USB, SD cards using STM32F407		
<b>Basic bibliography:</b>		
1. M. Galewski, STM32. Aplikacje i ćwiczenia w języku C, Wydawnictwo BTC, Legionowo 2011		
2. R. Pełka, Mikrokontrolery, Mikrokontrolery. Architektura, programowanie, zastosowania, Wydawnictwa Komunikacji i Łączności, Warszawa, 2001		
3. Geoffrey Brown, Discovering the STM32 Microcontroller, Indiana University, 2016		
<b>Additional bibliography:</b>		
1. K. Paprocki, Mikrokontrolery STM32 w praktyce, Wydawnictwo BTC, Legionowo 2011		
2. P. Borkowski, AVR i ARM7. Programowanie mikrokontrolerów dla każdego, Helion, 2010		
3. D. Belter, K. Walas, A Compact Walking Robot - Flexible Research and Development Platform, Recent Advances in Automation, Robotics and Measuring Techniques, vol. 267, R. Szewczyk, C. Zielinski, M. Kaliczynska (Eds.), pp. 343-352, 2014		
<b>Result of average student's workload</b>		
<b>Activity</b>		<b>Time (working hours)</b>
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	100	4
Contact hours	50	2
Practical activities	50	2