

Robotic Systems Hardware

Course Workload		Assessment form (examination/ graded test/ ungraded test)
ECTS	Hours	
3	108	Exam

The Robotic Systems Hardware course is dedicated to teaching the principles of programming microcontrollers, describing what microcontrollers are, how they work, what peripherals they have, how they can be connected to other devices and how they can interact with them, and how they can be programmed at a low level using the C language.

Course structure:

1. Introduction in Microcontroller systems

1.1. Introduction to ARM

2. Input-output ports.

2.1. Work with registers

2.2. GPIO

3. Simple communication interface with interrupts

3.1. Interrupts

3.2. USART

4. Timing in microcontrollers

4.1. Timers

4.2. Reset and Clock Control

5. Analog signals in robotics

5.1. Direct memory access

5.2. Digital to Analog converters

5.3. Analog to digital converters

6. DC motors control

- 6.1. Motor control
- 6.2. PWM generation
- 6.3. Position sensors

7. Serial peripheral interface

- 7.1. Serial peripheral interface

8. Inter Integrated Circuitous

- 8.1. I2C