



**T-535-MECH**

**MECHATRONICS II**

**6 ECTS**

**Year of study:** 3<sup>rd</sup> year BSc / 1<sup>st</sup> year MSc.  
**Semester:** Spring.  
**Level of course:** 3. First cycle, advanced / 4. Second cycle, introductory.  
**Type of course:** Core for MSc Mechatronics Engineering, elective for other programs.  
**Prerequisites:** Mechatronics I (T-411-MECH).  
**Schedule:** Runs for 12 weeks - 6 teaching hours a week.  
**Supervisor:** Torfi Þórhallsson.  
**Lecturer:** Baldur Þorgilsson.

**Learning outcome:**

*Knowledge:* On the completion of the course the student should know

- What an embedded system is
- In details how a microcontroller works
- Of several options of sensors and actuators

*Skills:* On completion of the course the student should

- Be able to program an embedded system
- How to interface various sensors and actuators to a microcontroller

*Competence:* On the completion of the course the student is competent to

- Choose a microcontroller of a specific mechatronic task
- Choose sensors for a given mechatronic problem
- optimize code for a given hardware platform
- can complete a defined personal project in a systematic and predictable way

**Content:** Mechatronics-2 extends Mechatronics-1 by going into more details. While Mechatronics 1 is broader and more about getting results fast (what is possible), Mechatronics 2 is more about accuracy and how to match a design to a task with economy, accuracy and robustness in mind (what is the limit).

The course includes sensors, signal conditioning, interfacing, analog-digital conversion, digital input/outputs, timers, low level embedded firmware programming, actuators, UARTs and serial communication. It is expected that the student is familiar with digital electronics, analog electronics and the programming language C. Along with the lectures, each student has his/her own private project based on the fundamental elements of mechatronics: sense-think-act. For this project the student holds a lab notebook. At the end of the course the student delivers a report about the project.

**Reading material:** *Introduction to Mechatronic Design*, International edition J. Edward Carryer, R Mathew Ohline, Thomas W. Kerry, Pearson 2011, ISBN 978-0-13-609521-7.

**Teaching and learning activities:** Lectures, lab sessions, student's private project.

**Assessment methods:** Homework 20 %, Midterm evaluation 15%, 2 minute video 10%, Lab notebook 10%, Final report 30%, Final project presentation 15 %.

**Language of instruction:** English/Icelandic.

**All course descriptions may be subject to change.** Revised information on the course schedule, reading material, teaching and learning activities, and assessment methods will be introduced in the learning management system Canvas at the beginning of the semester.