

Course PM – Mechatronics basic course

Course data

Course code: MF2030

Credits: 6

Level: 2nd cycle

This course instance

Instance: Fall semester 2022, period 1

Course start: Tuesday, August 30, 15:00-17:00 in M2

People involved

Lecturer: Hans Johansson (hbjo@kth.se)

Georgios Andrikopoulos (geoand@kth.se)

Assistants: Tong Liu (tongliu@kth.se)

Kaige Tan (kaiget@kth.se)

Administrative issues: Vicki Derbyshire (vickid@kth.se)

Course responsible: Daniel Frede (frede@kth.se)

Student office

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Schedule

The schedule is found on the course homepage: <https://canvas.kth.se/courses/35116>

Prerequisites

First level course(s) in math, mechanics, electrical engineering, automatic control and programming.

Course objectives

The course gives an overview of the basics of mechatronic systems and products including the components and characteristics typical for such systems. The course introduces a mechatronics design procedure and provides insight into both advantages and difficulties of mechatronics design. The overall aim is that the students in relevant subsequent courses are able to apply this design procedure and in a stepwise manner deepen their proficiency in using it. After completion of the course the students should be able to:

1. Describe the basic building blocks of mechatronic systems (e.g. hardware, software, interfacing, sensing, control and actuation).
2. Discuss if a mechatronic design might be feasible as a solution to a given functional problem formulation.
3. Sketch such a technical solution and select component types.
4. Identify critical problems/design issues and suggest feasible methods and tools to solve those.
5. Be able to summarize, and on smaller problems apply a development model for mechatronic product development.
6. Model, simulate and synthesize (but not realize) smaller mechatronic systems and products.

Course layout

The course is based on 10 two-hour lectures, 7 three-hour guided exercises, a quite substantial hand-in assignment (group work), and selected parts of a rather extensive course book.

Lectures

The lectures reflect the main course content and are supported by clearly specified parts of the course text book, lecture notes and exercises for individual practising. All course material is made available on-line, but not handed out on paper.

Guided exercises

During the exercises the students are working with:

- Tutorials to learn the tools used in the course
- The hand-in assignment

Assistants are present to help out and guide when necessary.

Hand-in assignment

The hand-in assignment consists of a rather large “project” with a set of tasks to be solved through teamwork in groups of three students.

Literature

- Janschek, Klaus, **Mechatronic Systems Design – Methods, Models, Concepts**, 1st Edition., 2012, XXI, 805 p., Springer Science, ISBN: 978-3-642-17530-5 (Print) 978-3-642-17531-2 (Online) (specified parts of the book are used).
- Course material made available on-line: lecture notes, tutorials, assignment, exercises.

Note! Thanks to the fact that KTH subscribes to Springer e-books, students can buy the book as a print-on-demand MyBook version at a fair price or download pdf-files for free chapter by chapter or the book as a whole.

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Examination

- Hand in assignment, 3.0 credits, grade scale: P, F.
The assignment is solved and reported as group work.
- Written Exam, 3.0 credits, grade scale: A, B, C, D, E, FX, F

The ***final total course grade*** equals the grade on the written exam.

Please note that timely and thorough work on the assignment is very likely to pay off on the written exam!

Good luck!