AUTOMATION & CONTROL INSTITUTE
INSTITUT FÜR AUTOMATISIERUNGS-
& REGELUNGSTECHNIK

TU WIEN

Univ.Prof. Dr.sc.techn. Georg Schitter

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Mechatronic Systems Laboratory

Course LU 376.051 (3 ECTS)
Summer semester 2016

Start of the presentation 15:00

Goals of the course

- The student can analyze the dynamics of a mechatronic system and design the sensors, electronics and control to retrieve the necessary information to examine its behavior
- The student is able to understand and use the different disciplines that are employed in the design of mechatronic systems
- The student can design and implement analog filters and digital control systems and employ them in real mechatronic systems
- The student can solve mechatronic problems from a system engineering perspective

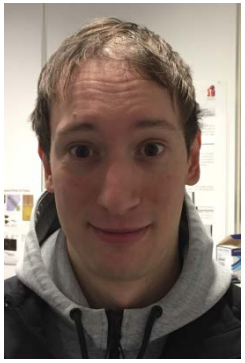
Instructors and teaching assistants

- **Instructors:**
  - Francesco Cigarini

    cigarini@acin.tuwien.ac.at
  - Shingo Ito
  - Han Woong Yoo



- **Teaching assistants:**
  - Christoph Kerschner
  - Bernhard Lindner
  - Johannes Schlarp
  - Wolfgang Stritzinger




Laboratory exercises

- The course is divide into 6 exercises:
  - Controllability and Observability of Dynamic Systems (CO)
  - Sensor Principles (SP) and Optical System (OS)
  - Implementation of Analog and Digital Filters (FI)
  - Principles of Atomic Force Microscopy (AFM)
  - CD Player (CD), divided in:

    CD Player 1: System identification

    CD Player 2: Control design
- Time division:
  - CO + OS + SP: totally 8 hours (two afternoons)
  - FI + AFM: totally 8 hours (two afternoons)
  - CD: totally 8 hours (two afternoons)

Grading

- **Successful completion of <u>all</u> the laboratory exercises is necessary to pass the course**
  - **Negative mark on one exercise = negative grade for the entire course**
- An entrance exam will take place at the beginning of each laboratory exercise (based on the course materials available on TUWel)
  - **A positive result in the entrance exam is a prerequisite to take part to the lab**
- Evaluation is based 25% on the entrance examination, 25% on the laboratory work and 50% on the written reports
- Withdrawal from the course without a grade is not possible
- In case of plagiarism, the student fails automatically and may be reported to the Dean's office.

Schedule

- In order to get a place in the course, fill your name in the registration form **today**
  - You **cannot** fill the form for your friends or colleagues
  - Students who are not present today must contact Francesco Cigarini (cigarini@acin.tuwien.ac.at) **before March 20th 2017** for registration to the course
- Location of the laboratory exercises:
  - Messtechnik Labor 1 (CA0402) and 2 (CA0406), 4th floor, Institute for Automation and Control (ACIN)
- Day and time:
  - Monday: from 13.00 to 17.00
  - Wednesday: from 13.00 to 17.00

Group schedule

Students will be divided in four groups (max. 15 students per group):

- Schedule for groups A and B (afternoons 1–6):
  - March 20th, March 22th, March 27th, March 29th, April 3rd, April 5th
- Schedule for groups C and D (afternoons 7–12):
  - April 24th, April 26th, May 3rd, May 8th, May 10th, May 15th
- **Registration to a specific group must be done electronically on TUWel (https://tuwel.tuwien.ac.at)**

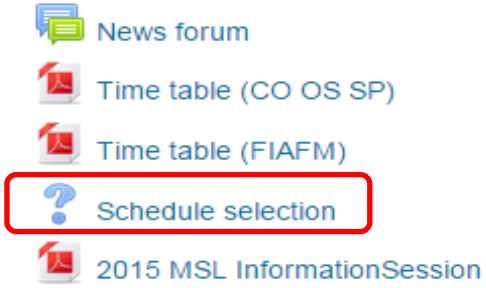
Timeline

Afternoon	Group A	Group B
1	FI + AFM	CO + OS + SP
2	FI + AFM	CO + OS + SP
3	CO + OS + SP	CD
4	CO + OS + SP	CD
5	CD	FI + AFM
6	CD	FI + AFM

Afternoon	Group C	Group D
7	FI + AFM	CO + OS + SP
8	FI + AFM	CO + OS + SP
9	CO + OS + SP	CD
10	CO + OS + SP	CD
11	CD	FI + AFM
12	CD	FI + AFM

TUWEL

- Registration to the course on TUWel is necessary for the selection of laboratory schedule and access to the course material
- Registration available from March 9th 2016, 15:00 to March 20th 2017, 12:00
- Enrolment key: **2017S**
- Selection of laboratory schedule is done by choosing a group



- Contact Francesco Cigarini (cigarini@acin.tuwien.ac.at) as soon as possible if none of the groups is suitable for you
- Also contact Francesco Cigarini to modify the schedule in case of accident or illness (doctor note necessary)

Things to bring with you to the lab

- USB memory stick:
  - At least one USB memory stick is necessary to download experimental data to be used for report writing
  - Not only computers, but also oscilloscopes are compatible with USB memory sticks
- Calculator:
  - Although not absolutely necessary, a calculator may be useful during the entrance examinations
  - For the laboratory exercises themselves, computers with Matlab can also be used for calculation

Thank you for your attention