

ME-420

Jamie Paik

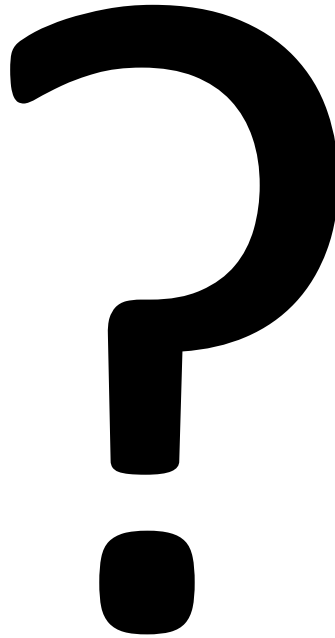
Reconfigurable Robotics Laboratory

EPFL, Switzerland



ME-420 Advanced Design for Sustainable Future





Motivation

- Study and nurture the creativity and decision-making processes in constructing solutions by being immersed in A to Z of product development. In-depth analysis of the operation principles, automation technologies, and production for their sustainable and functional applications.

Content

- Study and explore design principles of the different mechatronic components and systems.
- Study and model the sensor feedback actuator motions and integration, construction methods.
- Understand design and working principles of various smart systems and 3D architectures in the current state-of-the-art.
- Understand and further define engineering specifications that dictate various product design processes.
- The final report and presentation should reflect the considerations made toward the covered methodologies.

Content

- Study and explore design principles of the different mechatronic components and systems.
- Study and model the sensor feedback actuator motions and integration, construction methods.
- Understand design and working principles of various smart systems and 3D architectures in the current state-of-the-art.
- Understand and further **define engineering specifications that dictate design processes.**
- The final report and presentation should reflect the considerations made toward the covered methodologies.

Objectives

- To design and to prototype a new product.
- The goal is to learn principles and methods of product development in a functional context.
- Paying special attention to sustainability



- **COURSE PREREQUISITES**
 - ME 302 (aka ME212) or Microstructures technology I and II
 - Only offered either ME 410 or ME 420
- **Evaluation**
 - 70 % Project (report, presentation and prototype)
 - 30 % Participation
- **Course makeup**
 - 3hr / week contact hours, 5 credits
 - TA office hours on Friday 11-13h on zoom or by appointments

- Students are expected to work in groups of 5-6 to solve the chosen open-ended problem.
- Everyone in the group will receive the same final grade for the report / presentation / prototype but participation grade may vary.
- Each group is expected to produce update slides prior to the class for presenting to the instructor during the individual group meeting.
- Written report should follow the sample report format

EPFL Demo day



ME-420 Advanced Design for Sustainable Future

- Mandatory participation
- Working Prototype Demo for the Public Presentation on **6th Dec** at 9-15h.
- Acuator + sensor + microprocessor kit are provided for building a prototype for each group.
- High importance on the creative solution, working concept, and a functioning prototype
- **Poster + flyer + Screen + Prototype presentation with apero** on the 6th Dec. 12h-15h

Final Presentation in class

- Starts at 8h15, 12th December.
- Soft copy of presentation : upload to Moodle on the 13th Dec.
- 1 representative from each group will present for total of 15 min and followed by a Q&A session.
- All members should be present.
- 5-7 min question period should be answered by anyone from the group

Final report (format on Moodle)

- Due 19 December
- Soft copy: uploaded on the Google drive on MOODLE
- Late submission will lose 50 % of the grade.

See ME 420 schedule on moodle for class info.

Teaching Assistants



Yuhao Jiang
(Yuhao)



Hwayeong Jeong
(Hwayeong)



Ziqiao Wang
(Ziqiao)



Serhat Demirtas
(Serhat)



Alexander Schüssler
(Alex)



Alihan Bakir
(Alihan)



Shaopeng Jiang
(Jaspor)

Material Boxes

- Return Date: December 12th! (Last class in person)
- Choose a representative to get the Material Boxes
 - The name will be written!

Ordering materials

- SPOT use (3D-Printing, assemblies, testing, etc) but! Remember!
- Ordering happens on three dates (week 4, 6, 9)