MICRO-501

MEMS practicals I

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Cursus	Sem.	Type
Microtechnics	MA1, MA3	Opt.

Language of teaching	English
Credits	2
Withdrawal	Unauthorized
Session	Winter
Semester	Fall
Exam	During the semester
Workload	60h
Weeks	14
Hours	**2 weekly**
Practical work	2 weekly
Number of positions	

It is not allowed to withdraw from this subject after the registration deadline.

Summary

Objective of this practical is to apply in specific experimental settings the knowledge acquired in various MEMS related class

Content

The practical is organized in several lab experiments.
The part I (winter semester) is dedicated to MEMS technology and MEMS simulation:

- Finite element simulation of MEMS
- Design of MEMS actuators
- Fabrication of MEMS actuators
- Caracterization of MEMS actuators
- Noise in sensors

The part 2 (spring smester) is dedicated to sensors:

- capacitive accelerometer
- ISFET
- Glucose sensor
- piezoresistive pressure sensor
- Electrokinetic chip

Keywords

MEMS, FEM simulation, microsensors, microtechnology, microactuators, silicon micromachining

Learning Prerequisites

Recommended courses

Capteurs, Advanced MEMS, Materials and technology of microfabrication, Modeling and simulation of microsystems, Nanotechnology, Flexible bioelectronics, Scaling laws in micro- and nanosystems

Learning Outcomes

By the end of the course, the student must be able to:

- Conduct an experiment
- Report on experiments

Transversal skills

- Demonstrate the capacity for critical thinking

Teaching methods

Practicals suprevised by assistants

Expected student activities

- Make the experiments
- use a lab notebook
- write a short report after each experiment

Assessment methods

- based on work in the lab, anwer to questions during experimental sessions and quality of the report

Supervision

Office hours	Yes
Assistants	Yes

Resources

Moodle Link

- https://go.epfl.ch/MICRO-501