

MICRO-501

**MEMS practicals I**

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Cursus	Sem.	Type
Microtechnics	MA1, MA3	Opt.

Language of teaching	English
Credits	2
Withdrawal Session	Unauthorized Winter
Semester	Fall
Exam	During the semester
Workload	60h
Weeks	14
<b>Hours</b>	<b>2 weekly</b>
TP	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
- Characterization of MEMS actuators
- Noise in sensors

The part 2 (spring semester) 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**

Capturs, 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 supervised 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, answer to questions during experimental sessions and quality of the report

### Supervision

Office hours	Yes
Assistants	Yes

### Resources

#### Moodle Link

- <http://moodle.epfl.ch/course/view.php?id=14283>