EPFL

MICRO-332(a)	**Manufacturing DLLs (automne)**

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Cursus	Sem.	Type
Microtechnics	BA5	Obl.

Language of teaching	English
Credits	2.5
Withdrawal	Unauthorized
Session	Summer
Semester	Fall
Exam	During the semester
Workload	90h
Weeks	14
Hours	**5 weekly**
TP	5 weekly
Number of positions	

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

Summary

The goal of this DLL is to introduce students to both the practical aspects of micro-fabrication of a fully functional device.

Content

This course is reserved for students registered in the bachelor of micro-engineering!
This DLL includes two parts. One related to clean-room fabrication process ('Micro332(a)') and a second one ('Micro332(b)'), that addresses system integration and packaging.
The overall goal is to go through a small process chain of a wearable, to fabricate it, to integrate it and finally, to test it.

Keywords

photoresist, photolithography, wet etching, sheet resistance, under-etching, mask alignment, sensor packaging, microassembly, system level integration and testing.

Learning Outcomes

By the end of the course, the student must be able to:
- Conduct experiments on photolitography and etching
- Interpret experimental results
- Apply the guidelines related to the work in a cleanroom environment
- Conduct Assembly experiments
- Interpret obtained measurement data

Transversal skills

- Write a scientific or technical report.
- Evaluate one's own performance in the team, receive and respond appropriately to feedback.
- Keep appropriate documentation for group meetings.

Teaching methods

• Combination of lectures, prerecorded videos, demonstration and lab sessions.

Expected student activities

Micro 332(a): (Fall)
1. *Introduction to the clean room (1 session):* Clean room environment, security aspects, process flow chart.
2. *Basic micro-electronic and microsystem procedures (2 sessions)*
3. Photolithography step with alignment, and wet or dry etching step. *(in Lausanne campus)*
4. *Electrical characterization*
5. *Report and summary preparation for knowledge transfer to the 2nd part of the course*

Micro 332(b): (Spring)
1. *Design of a 3D package for a wearable sensor*
2. *Assembly of the sensor electronics on the board (in Neuchâtel campus)*
3. *Overall integration and functionality testing*
4. *Modelling*
5. *Report preparation*

Assessment methods

Final grade is the ECTS weighted average (2 and 3) of both grades for Micro 332(a) and the Micro 332(b), respectively. Assessment method is based on the reports.

Supervision

Office hours	No
Assistants	Yes
Forum	No
Others	Moodle