

MICRO-706

**Microfluidics for lab-on-a-chip**

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<b>Cursus</b>	<b>Sem.</b>	<b>Type</b>
Microsystems and Microelectronics		Opt.

Language of teaching	English
Credits	1
Session	
Exam	Term paper
Workload	30h
<b>Hours</b>	<b>14</b>
Courses	14
<b>Number of positions</b>	<b>30</b>

**Frequency**

Every 2 years

**Remark**

Next time in Spring 2024

**Summary**

The course covers the entire field of lab-on-a-chip technology, including microfluidic principles and various microfabrication approaches, and presenting concrete examples of devices for (bio)analysis, cell biology, tissue regeneration and microreactors.

**Content**

- Introduction to microfluidics and lab-on-a-chip technology – origins - scaling laws – applications
- Microfluidic principles: flow actuation; pumps; mixers; valves; etc.
- Introduction to fabrication techniques for the production of microfluidic devices, using “cleanroom materials” such as silicon and glass, as well as polymer materials.
- Surface modification: surface passivation; and immobilization of active and/or recognition elements
- (Bio)molecule analysis: sample preparation; molecular separation; integrated devices for biomolecule analysis
- Microreactors
- Microfluidics for cell biology: engineering device for experimentation on cells; tissue regeneration and organ-on-a-chip platforms

**Keywords**

Microfluidics, Lab-on-a-Chip, Bioanalysis, Microfabrication, Organ-on-a-Chip

**Resources****Moodle Link**

- <https://go.epfl.ch/MICRO-706>