MICRO-605 **Optical MEMS and micro-optics**

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Cursus	Sem.	Type
Microsystems and Microelectronics		Opt.
Photonics		Opt.

Language of teaching	English
Credits	1
Session	
Exam	Oral
Workload	30h
Hours	**14**
Courses	14
Number of positions	**20**

Frequency

Every 2 years

Remark

Next time November 1st - 4th 2021, 1pm - 4.30pm

Summary

Micro-optics and optical MEMS comprise advanced techniques to manipulate light with superior precision and speed to realize compact yet versatile optoelectronic systems. MICRO605 covers the necessary theory, basic practical aspects, and the device and system concepts for these closely related fields

Content

1. Microoptics

a) Diffractive optics, holograms and micro-optics
b) Propagation of light (Fourier optics)
c) Simulation of optics: ray-tracing
d) System concepts and scaling laws
e) Limits of miniaturisation
f) Moving towards the nanoscale
g) Metasurfaces: new or old concept, is a thin, aberration free lens possible ?

2. Optical MEMS (MOEMS)
a) Actuation and position sensing
b) Scanning and pointing micromirrors
c) Tunable diffraction gratings
d) Tunable optical resonators
e) MOEMS in displays
f) MOEMS in imaging
g) MOEMS in spectroscopy
h) MOEMS in optical telecommunication
i) Emerging topics

Learning Prerequisites

Recommended courses

- Introductory course to optics and microfabrication technologies
- Basics of chemistry and physics

Resources

Websites

- http://opt.epfl.ch/