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