

Name Module	Lab on a Chip
Language	English
Contact person	Jan Eijkel
Specific prerequisites (regarding incoming exchange)	
Participating study	EE, AT, BME, CT, CREATE
Starting block	2

Theme

With present-day micro- and nanotechnology we can downscale an entire laboratory and put it on a chip. In this module you design and build your own Laboratory on a Chip to address a specific a medical or environmental measurement problem, for example crime scene investigation DNA analysis, ecstasy analysis, or to make a beer brewery on a chip. You will try out your device on a real-life sample. You work in a multidisciplinary team of 4, composed of students from all participating bachelor's programs.

Content (including project)

Leading goal:

- In a multidisciplinary team design, build and measure with a Lab on a Chip

Get introduced to

- laboratory on a Chip technology
- design methodology and tools
- prototyping/manufacturing techniques
- small-scale electrical and optical measurement techniques

Obtain theoretical and practical experience with

measurement science and devices

Learning goals

- Give the students the experience of working in a multidisciplinary development team.
- Make the full *design circle* (design, build, and measure) for a real-life measurement problem using Lab on a Chip technology.
- Make students acquainted with state-of-the-art prototyping techniques such as polymer molding and 3D printing.
- Teach students how to properly perform a measurement and how to interpret measurement data.
- Give students insight in the science behind the transduction process involved in measuring and its possibilities and limits.

Educational forms

Project (leading)

Knowledge exchange within the groups
General introductory lectures/tutorials/problem-based learning
Tutoring on demand.
Practical measuring techniques.

Assessments

Individual:
Weekly assignments; oral exam in week 10.
Group:
Group deliverables: project plan (week 1), design (week 4), final device, report and presentation (week 10)