

Course syllabus

Lab-on-a-chip i medicinska tillämpningar Lab-on-a-chip in Biomedical Applications

EEMN26, 7,5 credits, A (Second Cycle)

Valid for: 2023/24

Faculty: Faculty of Engineering, LTH

Decided by: PLED BME

Date of Decision: 2023-04-13

General Information

Elective for: B4, BME4-bf, E4-mt, F4, F4-mt, N4-nbm

Language of instruction: The course will be given in English on demand

Aim

The course gives a detailed technical view into miniaturised bioanalysis and highlights some of the lab-on-a-chip technologies that are currently used in clinical medicine and biomedical research. Fundamental principles for bioanalysis integrated in microfluidic systems where sample handling and detection principles are key areas of interest are emphasized. These will be penetrated through lectures and lab exercises.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

- be able to explain fundamental lab-on-a-chip principles
- have an understanding for scaling laws within microfluidics and bioanalysis

Competences and skills

For a passing grade the student must

- be able to analyse and describe the function of microfluidics based bioanalysis systems
- be able to give examples of miniaturised technologies that currently are used within bioanalysis
- be able to recommend and justify the choice of materials for the construction of a lab-on-a-chip system

Judgement and approach

For a passing grade the student must

- be able to analyse and highlight benefits and drawbacks of miniaturising a given bioanalytical quest

Contents

The course is based on a lecture series that will convey both basic lab-on-a-chip technology and describe how this is applied in modern bioanalysis. Guest lecturers from renowned bioanalysis companies in the region will further point out the importance and the value of miniaturised and automated bioanalysis within the health care sector and within medical research. The course will also encompass a series of lab exercises that outline a set of clinically relevant analytical techniques that are based on microfluidics and lab-on-a-chip technology, that aims at giving hands on experience in the basic construction of microfluidics based analysis systems and thereby provide a wholistic view of the lab-on-a-chip technology

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)

Assessment: To pass the course approved lab exercise reports and written exam is required

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Parts

Code: 0118. **Name:** Examination.

Credits: 6. **Grading scale:** TH. **Assessment:** Approved written exam

Code: 0218. **Name:** Lab Exercises.

Credits: 1,5. **Grading scale:** UG. **Assessment:** Approved laboratory work

Admission

Assumed prior knowledge: 3 years of studying at Faculty of Engineering.

The number of participants is limited to: No

Reading list

Contact and other information

Course coordinator: Maria Antfolk, maria.antfolk@bme.lth.se

Course homepage: <http://bme.lth.se/course-pages/lab-on-a-chip-i-biomedicinska-tillaempningar/lab-on-a-chip-in-biomedical-applications/>