

Course syllabus

Mikrosensorer Micro Sensors

EEMN01, 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

Main field: Nanoscience.

Elective for: BME4, D4, E4-ss, F4, F4-nf, F4-ss, MNAV1, MSOC2, N4-nf

Language of instruction: The course will be given in English

Aim

Measurement technology and transducers are important in every field of activity for an engineer. For example, detailed studies of brain signals, detection of light in optical fibres or supervision of process industries. The amount of micro sensors is increased in the society, especially in the automobile industry where airbag sensors, tilt sensors and tire pressure sensors are standard today.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

- Have theoretical knowledge of different fabrication processes for micro sensors.
- Be able to explain the function of different detection methods.
- Be able to choose a suitable sensor design and instruments in a given measurement situation and perform measurements.

Competences and skills

For a passing grade the student must

- Have gained experience in experimental work.
- Be able to construct a measurement system in practice.

- Be able to search, sort out and acquire information from an extensive information material without reading instructions.
- Be able to report acquired information and experimental results orally and in writing.

Judgement and approach

For a passing grade the student must

- Be able to critical judge the results to minimize the risk of errors in measurements and misreadings

Contents

The course is characterised by experimental and independent work, combined with a series of lectures that presents the fabrication and physical principles of silicon based micro sensors. Laboratory work and project focus on fabrication of silicon micro structures together with studies and characterization of the sensors that you fabricate in the clean room laboratory work. Basic knowledge in process technology for micro mechanical components and sensors will be given. For example, lithography steps and etch methods will be discussed.

Examination details

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

Assessment: For grade 3 is required teoretical study with written report, passed project and accompished poster presentation. For a higher grade a written exam is given.

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.

Admission

Assumed prior knowledge: EEM007 or BMEF05 Electrical Measurements, EEM045 Sensors, EEMF15 Sensors and Measurements, ESSF10 Electrical Measurements or similar.

The number of participants is limited to: 28

Selection: Number of credits within the programme. Priority is given to students enrolled on programmes that include the course in their curriculum.

The course overlaps following course/s: EEM050

Reading list

- E-books accessible from the university library.

Contact and other information

Course coordinator: Martin Bengtsson, martin.bengtsson@bme.lth.se

Course homepage: <http://bme.lth.se/course-pages/mikrosensorer/mikrosensorer/>