Technology
Arts Sciences
TH Köln

Course
MNST - Micro and nano systems

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General information

Long name	Micro and nano systems
Approving CModule	MNST_MaET
Responsible	Prof. Dr. Karl Kohlhof Professor Fakultät IME
Level	Master
Semester in the year	winter semester
Duration	Semester
Hours in self-study	78
ECTS	5
Professors	Prof. Dr. Karl Kohlhof Professor Fakultät IME
Requirements	Basic knowledge of material science desired
Language	German
Separate final exam	Yes

Final exam

Details

Oral seminar presentation

Minimum standard

Grade 4.0

Exam Type

Oral seminar presentation

Lecture / Exercises

Learning goals

Knowledge

Introduction
Micro systems at market
Production principles and strategies

Sensors and actuators
Signal transformation
Materials

Production technologies
Clean room
Lithography, micro structuring
Thermal procsses
Thin film techologies
Construction techniques
Mass production

Design and simulation
MEMSPro - Spice based circuit simulation
ANSYS - Finite element simulation of physical processes

Applications
Micro pump, micro valve, ink jet head
Micro motor
Acceleration sensors, gear rate sensor
Micro cimate sensor
Micro mirror display / digital light processor
Micro sensors in smart phones

Skills

Selection of known micro / nano procduction concepts

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strategic integration of mico and nano technologies

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structured design and simulation of micro / nano systems

Seminar talk: research, preparation, structuring, presentation

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simulation of micro / nano systems

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Lecture	2
Exercises (whole course)	0
Exercises (shared course)	0
Tutorial (voluntary)	0

Separate exam

Exam Type

discussion (interview) about special issues (szenario, project assignment, literature research)

Details

Presentation of result of literature reseach

Minimum standard

Approve

Seminar

Learning goals

Knowledge

Presentation structure

Skills

Scientific research tools

Scientific citation

Literatur research to given topic

Structuring, preparation and oral presentation of scientific talk

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Seminar	2
Tutorial (voluntary)	0

Separate exam

Exam Type

working on projects assignment with your team e.g. in a lab)

Details

Structuring of presentation

Minimum standard

Grade 4.0