Courses in English
Course Description

Department 06 Applied Sciences and Mechatronics

Course title Micro- and Nanostructures (MA)

Hours per week (SWS) 4

Number of ECTS credits 6

Course objective
• Knowledge of micro- and nanostructure fabrication processes
• Understanding of factory integration
• Understanding of exemplary devices and circuits
• Extended knowledge of solid state structures and devices on the nanoscale
• Interdisciplinary understanding of nano-device application

Prerequisites Basics in Micro- and Nanotechnology

Recommended reading
• S.M. Sze, Semiconductor Devices, Wiley
• R. Waser, Nanoelectronics and Information Technology: Materials, Processes, Devices, Wiley-VCH
• Moodle course

Teaching methods lecture and exercise

Assessment methods written exam, 90min

Language of instruction English

Name of lecturer Prof. Christina Schindler

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Link

Course content
Semiconductor physics
• Energy bands in semiconductors

Devices
• MOS diodes
• MOSFETs
• New transistor concepts, e.g. cell-transistor coupling
• Example of use: logic, scaling, integrated circuits

Semiconductor technology
• Lithography
• Etching technology (focus on KOH and dry etching)
• Oxidation, diffusion, implantation
• Thin film deposition (physical and chemical vapor deposition, self-assembling monolayers)
• Printed electronics

Example of use: memory technology

Working on technical publications on the different topics

Remarks •