Courses in English

Course Title: Micro- and Nanostructures

Department: 06 Applied Sciences and Mechatronics

Hours per week (SWS): 4

Number of ECTS credits: 6

Course objective: After completing this module successfully students possess or have improved their competencies in the following fields:

- They know micro-and nanostructure fabrication processes and by discussing areas of application they can describe advantages and disadvantages;
- They have an improved understanding of semiconductor processes and tools and can draw them schematically;
- They know selected examples for micro-and nanostructures and -devices based on the mentioned processes, they can describe them physically and point out areas of application and the potential for further development;
- They have improved their physical understanding of solid state structures and devices with dimensions in the nanometer range;
- They understand the interdisciplinary approach and comprehensive use of nanostructures and -devices.
- They can design a process flow for a given device, identify failures in thin film stacks, and develop improved processes.
- They have improved their technical English.

Prerequisites: Bachelor degree, Fundamentals in solid state physics

Recommended reading:
- R. Waser, Nanoelectronics and Information Technology: Materials, Processes, Devices, Wiley-VCH.
- Moodle course with video lectures.

Teaching methods: 180 h, of which:
- 60 h seminaristic teaching
- 120 h individual work

Assessment methods: written exam, 90min

Language of instruction: English

Name of lecturer: Prof. Dr.-Ing. Christina Schindler

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Link: www.fb06.fh-muenchen.de/fb/index.php/de/vita.html?staffid=738
Courses in English
Course Description

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
Excercises to all discussed topics
Working on technical publications on the different topics and presentation in front of the class
short presentations of up-to-date topics in the field of "micro-and nanostructures"

The lecture is held in English.

Remarks
The exam can also be given in German. Videos are available.