

Department	06 Applied Sciences and Mechatronics
Course title	Semiconductor and Thin Film Technology (PBR 650)
Hours per week (SWS)	4
Number of ECTS credits	5
Course objective	Related to the generic educational objectives of the degree program, this module intensifies the engineering knowledge in engineering physics with focus on the most important fabrication processes in modern semiconductor technology. Students gain the ability to understand, describe, and evaluate correlations between the fabrication processes of semiconductor devices. They gain practical experience with typical fabrication tools. After completing this module, students can plan the fabrication process for a target device, they can recognize failures in thin film systems, and they can develop improved processes.
Prerequisites	
Recommended reading	S.M. Sze, Semiconductor devices, physics and technology, John Wiley & sons R. Waser, Nanoelectronics and Information Technology: Materials, Processes, Devices, Wiley-VCH Moodle-course with videos
Teaching methods	lecture, exercises, lab class
Assessment methods	75% Written: 90'; 25% Lab Class (voluntary)
Language of instruction	English
Name of lecturer	Prof. Christina Schindler
Email	christina.schindler@hm.edu
Link	https://sci-intern.hm.edu/fk/modulbeschreibungen.php?lang_nr=&id=1681
Course content	<p>Introduction</p> <ul style="list-style-type: none">- historical review- short introduction to semiconductor physics- silicon as base material- properties of thin films- semiconductor fabrication- clean room technology <p>Structuring</p> <ul style="list-style-type: none">- lithography- etching technology <p>Thin film fabrication</p> <ul style="list-style-type: none">- oxidation, diffusion, implantation- PVD processes (physical vapor deposition)- CVD processes (chemical vapor deposition) <p>Analytics</p> <ul style="list-style-type: none">- thickness measurement- surface characterization- analysis of interfaces <p>Application: memory devices</p> <ul style="list-style-type: none">- DRAM- Flash <p>Lab class: fabrication of a diode or temperature sensor Experiments to the above mentioned topics</p>
Remarks	