

Course name	Laboratory Thin Films and Nanostructures			
In semester number	CIB6/CIB7			
ECTS- Credits (30 hours)	4			
Workload / hours	Total 120	Contact time 60	Self-study 45	Preparation for examination 15
Prerequisites	General, inorganic, and physical chemistry			
Total target	Knowledge of how to prepare thin films with a thickness in the range from several nanometers to several micrometers. Knowledge of how to test and control the function of these layers. Knowledge of how to prepare various types of nanoparticles. Capability to produce such thin films and nanoparticles.			
Content	Experiments: Silanisation of silicodioxide, adsorption of block-co-polymers, dip coating, sol-gel-techniques, hydrothermal synthesis, preparation and application of screen printing paste, photoactivity of nanoporous films, Stober synthesis, preparation of various nanoparticles			
Reference material	Original publications, course manual			
Module owner	M. Dürr			
Language	English/German			

Description

Type of instruction/ type of learning	Hours /week	Targets, learning outcomes	Type of assessment	Estimated student workload in hours
Laboratory including preparation, lab reports, oral presentation and preparation for examination	4	<p>Knowledge of the different methods of how to prepare thin films with a thickness in the range from several nanometers to several micrometers.</p> <p>Knowledge of the different properties which the films may exhibit depending on thickness, base material, type of application, etc.</p> <p>Knowledge of how to test the properties of these films</p> <p>Knowledge of how to control the properties of these films.</p> <p>Capability to produce and test such thin films for surface functionalisation with special focus on silanisation, adsorption of block-co-polymers, sol-gel-techniques, preparation and application of screen printing pastes, photoactivity of nanoporous films.</p> <p>Knowledge of the different methods of how to prepare nanoparticles of different material, size, and shape.</p> <p>Capability to produce and test such nanoparticles with special focus on SiO₂ particles for superhydrophobic surfaces, TiO₂ particles for photocatalytic surfaces, and gold nanoparticles for testing optical properties of nanoparticles.</p>	Exam, 60 min	120
Total	4			120