Name of module	Process and Systems Engineering			
Semester	6			
ECTS-credits	8			
Language	English / German			
Extend of Work	Work load 240	Contact hours 120	Self study 80	Exam preparation 40
Prerequisites	Knowledge from modules surface technology and materials testing, Basic in physics (thermodynamics, heat and mass transfer)			
Total target	Process and systems engineering is considered as a base for successful and sustainable high-quality coatings. Therefore, it is necessary to communicate the importance of a comprehensive assessment of painting processes			
Module content	Presentation of industrially relevant painting processes especially for high quality applications, discussion of the process chain and the individual process steps, introduction of peripherical systems (conveyor, robot), introduction of the thermodynamical layout of various apparatus, discussion of safety requirements and regulations Practical usage of various application techniques and paint systems, considering also the related process technology, Practical demonstration of the correlation between various process steps (pretreatment, application, drying)			
Reference material	H. Kittel: Lehrbuch der Lacke und Beschichtungen, Bd. 9: Verarbeitung von Lacken und Beschichtungsstoffen, S. Hirzel Verlag, Stuttgart A. Goldschmidt, H.-J. Streitberger: BASF-Handbuch Lackiertechnik, Vincentz-Verlag, Hannover T. Brock, M. Groteklaes,P.Mischke: European Coatings Handbook, Vincentz-Verlag, Hannover A. Goldschmidt, H.-J. Streitberger: BASF-Handbook on Basics of Coating Technology, Vincentz-Verlag, Hannover H.-J. Streitberger, K.-F. Dössel: Automotive Paints and Coatings, Verlag Wiley-VCH, Weinheim			
Offered	☒ every semester	☐ in winter term	☐ in summer term	
Relevance to other study programs	Potential elective course in *Supply engineering and Environmental technology*			
Responsible	Prof. Dr-Ing. J. Domnick			

Sections and efficiency statements

Type of instruction/ form of learning	Hours per week	Aims, learning outcomes	Type of assessment	Estimated students workload
Process and systems engineering lecture	4	Assessment of painting processes with respect to technology, costs and environmental impact Ability to verify the interaction between ther various sub-process in a paint shop Basic knowledge of the physical and technological layout of relevant apparatus and facilities	written exams 120 min	112
Laboratory paint application	4	Application of various technologies for pretreatment and coating Experiments with different coating (dip, spray, powder), pretreatment and drying technologies	Each experiment documented in an extensive protocol, throrough discussion of the results	128
Total	8			240