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 peripheral 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  
| H.-J. Streitberger, K.-F. Dössel: Automotive Paints and Coatings, Verlag Wiley-VCH, Weinheim  
Offered | ✗ every semester  
Relevance to other study programs | Potential elective course in *Supply engineering and Environmental technology*  
Responsible | Prof. Dr.-Ing. J. Domnick  

**Sections and efficiency statements**

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