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| Modulname | Surface Engineering & Coatings Technology | |
| Modulverantwortlicher/ Modulverantwortliche | Prof. Dr.-Ing. habil Annett Dorner-Reisel | |
| Qualifikationsziele | Surfaces engineering and coatings technology is essential for almost every technology. Motion of industrial parts, like production machines, powertrain components in automotive or airplane applications, environmental or energy technologies causes wear. The student should understand classical phenomena of tribology. Explanation and information about friction, wear and lubrications are given. Basics about tribological systems and the latest development in reduction of wear and energy consumption are after the course. Mechanical and tribological properties as well as functional behaviour (catalytic effects, energy consumption, signal sending) are essential for surface and coating selection and development. The smaller a device, the bigger the importance of the surface. Bio-devices, MEMS (microelectromechanical systems) catalytic surfaces, surfaces interacting with living matter like cells or self-assembling monolayers are already on their way to practical application. Students can recommend methods for surface engineering by treatments and coatings with thin or thick films according the practical demands. The course places great emphasis on micro- and nanostructure of special coatings as well as on trends in technology. | |
| Modulinhalte | Tribology and coatings for adjusted applications will be content. The software Cambridge Engineering Selector CES (company GRANTA DESIGN Ltd., Cambridge U.K.) is available (Hybrid synthesizer) for designing coatings or other hybrid materials. | |
| Lehrformen | Vorlesung (2 SWS) Übung (1 SWS) Praktischer Kurs (1 SWS) case study | |
| Voraussetzungen für die Teilnahme | basic knowledge of material science and chemistry | |

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| Literatur/multimediale Lehr- und Lernprogramme | <p>Mang, T., K. Bobzin, T. Bartels, Industrial Tribology: Tribosystems, Friction, Wear and Surface Engineering, Lubrication, WILEY:VCH Verlag GmbH & Co. KGaA, Weinheim, 2011</p> <p>Kawai, Y., H. Ikegami, S. Noriyoshi, A. Matsuda, K. Uchino, M. Kuzuya, A. Mizuno, Industrial Plasma Technology: Applications from Environmental to Energy Technologies, WILEY:VCH Verlag GmbH & Co. KGaA, Weinheim, 2010</p> <p>Wilson, M., K. Kannagara, G. Smith, M. Simmons, B. Raguse, Nano-technology: Basic science and emerging technologies, Chapman & Hall/CRC, London, 2002</p> <p>Hutchings, I., P. Shipway, Tribology: Friction and Wear of Engineering Materials, Elsevier, Cambridge, 2017</p> | |
| Lehrbriefautor | general disciplines of engineering and natural sciences (i.e. environmental, mechanical, industrial or electrical engineering) | |
| Verwendbarkeit | Pool International (English Lectures for Contact students) F MB PI | |
| Arbeitsaufwand/Gesamtworkload | Präsenzzeit 60 h + Vorbereitung 90 h = 150 Stunden = 5.0 Credit Punkte | |
| ECTS und Gewichtung der Note in der Gesamtnote | 5 | 1 |
| Leistungsnachweis | written exam (120 min) and certificate | |
| Semester | 1. Fachsemester | |
| Häufigkeit des Angebots | annually in the winter semester | |
| Dauer | 1 Semester | |
| Art der Lehrveranstaltung (Pflicht, Wahl, etc.) | annually in winter semester | |
| Besonderes | | |