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| Modulname | **LASER and Technical Optics** |
| Modulverantwortlicher/  Modulverantwortliche | Prof. Dr. Udo Behn |
| Qualifikationsziele | On completion of this course, the students should have some background knowledge on the wave properties of light. They should know the basic principles of optical imaging and they should be able to design and to calculate simple optical systems. Furthermore, the students should know the most important parameters to characterize a laser and to pick the right laser for the right application. |
| Modulinhalte | **Wave optics** (electromagnetic waves, spectrum, interference, temporal coherence, standing waves, resonance, longitudinal waves, propagation of light in matter, dispersion, reflection, refraction, total internal reflection, diffraction)  **Geometrical Optics** (basic imaging rules, mirrors, thin lenses, thin lens combinations, Oblique-ray-method, concept of principal planes, optical instruments)  **Lasers** (laser principles, light amplification, gain profile and longitudinal modes, resonators, transverse modes, generation of short pulses, frequency doubling, Gaussian beam properties, beam quality, non-Gaussian beams, application-relevant laser parameters and their measurement) |
| Lehrformen | Lectures and exercises, lab experiments, self-study |
| Voraussetzungen für die Teilnahme | Basic knowledge of wave physics and geometrical optics |
| Literatur/ multimediale Lehr-und Lernprogramme |  |
| Lehrbriefautor |  |
| Verwendbarkeit | Master Mechatronics (Mechanical Engineering). |
| Arbeitsaufwand/  Gesamtworkload | Lectures and exercises 45 h + lab 15h + self-studies 90 h = 150 hours = 5 credits |
| ECTS und Gewichtung der Note in der Gesamtnote | 5 ECTS  Gewichtung: 5/90 |
| Leistungsnachweis | Written exam 120min, written lab reports  Total grade = (2/3) written exam + (1/3) lab reports |
| Semester | winter semester |
| Häufigkeit des Angebots | annual |
| Dauer | one semester |
| Art der Lehrveranstaltung  (Pflicht, Wahl, etc.) | Optional compulsory modul |
| Besonderes |  |