Modulbezeichnung:	**Laser Technology (LT)** (Laser Technology)	**5 ECTS**
Modulverantwortliche/r:	Kristian Cvecek	
Lehrende:	Clemens Roider, Kristian Cvecek	

Startsemester: WS 2021/2022	Dauer: 1 Semester	Turnus: jährlich (WS)
Präsenzzeit: 60 Std.	Eigenstudium: 90 Std.	Sprache: Englisch

Lehrveranstaltungen:

Laser Technology (WS 2021/2022, Vorlesung, 4 SWS, Kristian Cvecek et al.)

Inhalt:

- Physical phenomena applicable in Laser Technology: EM waves, Beam Propagation, Beam Interaction with matter
- Fundamentals of Laser Technology: Principals of laser radiation, types and theoretical understanding of various types of lasers
- Laser Safety and common applications: Metrology, Laser cutting, Laser welding, Surface treatment, Additive Manufacturing
- Introduction to ultra-fast laser technologies
- Numerical exercises related to above mentioned topics
- Demonstration of laser applications at Institute of Photonic Technologies (LPT) and Bavarian Laser Centre (blz GmbH)
- Possible Industrial visit (e.g. Trumpf GmbH, Stuttgart)
- Optional: invited lecture about a novel laser application

Lernziele und Kompetenzen:

The student...

- would know the fundamental principles involved in the development of lasers.
- will understand the design and functionality of various types of lasers, and be able to comprehend laser specifications.
- will be able to design and analyse a free spac

e laser beam propagation setup.

- will gain knowledge about basic optical components used in laser setups such lenses, mirrors, polarizers, etc.
- would be able to understand the basic interaction phenomena during laser-matter interaction processes.
- would be able to determine the advantages and disadvantages of using laser process for industrial applications.
- will know and be able to apply the safety principles while handling laser setups.
- will be familiar with several most common industrial application of laser for material processing such as cutting, welding, material ablation, additive manufacturing.
- will be familiar with metrological applications of lasers.
- will become familiar with and be able to use international (English) professional terminology.

Verwendbarkeit des Moduls / Einpassung in den Musterstudienplan:

Das Modul ist im Kontext der folgenden Studienfächer/Vertiefungsrichtungen verwendbar:

[1] **Advanced Optical Technologies (Master of Science)**

(Po-Vers. 2018w | TechFak | Advanced Optical Technologies (Master of Science) | Gesamtkonto | Major Topics | Optical Material Processing | Lasertechnik / Laser Technology)

Dieses Modul ist daneben auch in den Studienfächern "Berufspädagogik Technik (Bachelor of Science)", "Berufspädagogik Technik (Master of Education)", "International Production Engineering and Management (Bachelor of Science)", "Maschinenbau (Bachelor of Science)", "Maschinenbau (Master of Science)", "Mecha-

tronik (Bachelor of Science)", "Mechatronik (Master of Science)", "Wirtschaftsingenieurwesen (Bachelor of Science)", "Wirtschaftsingenieurwesen (Master of Science)" verwendbar.

Studien-/Prüfungsleistungen:

Laser Technology (Prüfungsnummer: 71501)
(englische Bezeichnung: Laser Technology)

Prüfungsleistung, Klausur, Dauer (in Minuten): 120
Anteil an der Berechnung der Modulnote: 100% Prüfungssprache: Englisch

Erstablegung: WS 2021/2022, 1. Wdh.: SS 2022
1. Prüfer: Kristian Cvecek, 2. Prüfer: Michael Schmidt
