


Studiengang: <b>Master of Science Maschinenbau</b> Program: <i>Master of Science in Mechanical Engineering</i>														
1	Modul: <b>Advanced Material Testing</b> Module: <i>Fortgeschrittene Werkstoffprüfung</i>	English <i>Englisch</i>												
	<b>Fach-Nr.</b> <i>Course number</i>	<b>Semester</b> <i>Semester</i>	<b>Dauer</b> <i>Duration</i>	<b>Status</b> <i>Status</i>										
	MM	2	1	elective										
<b>Kreditpunkte</b> <i>Credits</i>	<b>Aufwand</b> <i>Workload</i>	<b>Kontaktzeit</b> <i>Contact-hours</i>	<b>Selbststudium</b> <i>Student's efforts</i>	<b>Turnus</b> <i>Regular cycle</i>										
5 ECTS	150 h	3 h = 45h lecture 1 h = 15h laboratory	30h preparation 30h exercises 30h exam preparation	annual										
2	<b>Beschreibung</b> <i>Description</i>  The current lecture provides knowhow of materials mechanical behaviour looking at loads, such as creep and fatigue. Also the mechanical behaviour of pre crack materials is looked under the topic of linear elastic fracture mechanics (LEFM). Each topic comprises the mechanical and physical laws, the influences effecting material life time and the testing methods for creep, fatigue and LEFM. In laboratory experiments the students can practise the theoretical knowhow and learn how to write a scientific laboratory report.													
3	<b>Lernziele</b> <i>Learning Outcomes</i>  The students... <ul style="list-style-type: none"> <li>• understand the importance of mechanical material behaviour for the application in design.</li> <li>• are able to determine the application limit of materials and the effects on component life.</li> <li>• understand the testing and evaluation methods of creep, fatigue and LEFM</li> <li>• are able to plan and execute laboratory experiments in a self-depending way.</li> <li>• can document their findings and results in a professional way.</li> </ul>													
4	<b>Schlüsselqualifikationen</b> <i>Key qualifications</i> <table border="1" data-bbox="207 1209 1500 1299"> <tr> <td>Sozialkompetenz</td> <td>Methodenkompetenz</td> <td>Selbstkompetenz / Personenkompetenz</td> <td>Interkulturelle Kompetenz</td> <td>Medienkompetenz</td> </tr> <tr> <td></td> <td>X</td> <td>X</td> <td></td> <td></td> </tr> </table>				Sozialkompetenz	Methodenkompetenz	Selbstkompetenz / Personenkompetenz	Interkulturelle Kompetenz	Medienkompetenz		X	X		
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	X	X												
5	<b>Lehrveranstaltung/ -methoden</b> <i>Course type and methods</i>  class room lecture and laboratory exercise													
6	<b>Vorbedingungen / Vorkenntnisse</b> <i>Prerequisites</i>  <ul style="list-style-type: none"> <li>• Basic material science based on courses for bachelor mechanical engineering</li> <li>• Mechanics and strength of materials, mechanical design</li> <li>• testing methods: tensile testing, hardness, Sharpy test</li> <li>• technology of metallic materials: heat treatment, forming and joining</li> </ul>													
7	<b>Arbeitsmittel / Literatur</b> <i>Required material / Literature</i>  U. Täck: Advanced Material Testing, Script University of Applied Science Lübeck H. Blumenauer et.al.: Werkstoffprüfung. VEB Deutscher Verlag für Grundstoffindustrie R. Bürgel: Festigkeitslehre und Werkstoffmechanik. Bd. 1 & Bd. 2. Vieweg J. Rösler et.al.: Mechanical Behaviour of Engineering Materials. Springer-Verlag D. Radaj, M. Vormwald: Ermüdungsfestigkeit. Springer-Verlag D. Gross, Th. Seelig: Bruchmechanik - mit einer Einführung in die Mikromechanik. Springer-Verlag T. L. Anderson: Fracture Mechanics. Taylor & Francis J. Schijve: Fatigue of Structures and Materials. Kluwer Academic Publishers													

Detailinformationen																				
8	<b>Inhalte</b> <i>Course topics</i> <ul style="list-style-type: none"> <li>• Introduction to mechanical behaviour of materials and type of loading</li> <li>• creep</li> <li>• fatigue</li> <li>• linear elastic fracture mechanics</li> </ul>																			
9	<b>Prüfungsform</b> <i>Assessment</i> <ul style="list-style-type: none"> <li>• Written exam</li> <li>• laboratory exercises with reports</li> </ul>																			
10	<b>Voraussetzung für die Vergabe von Kreditpunkten</b> <i>Requirements for granting of credits</i> <p>Class room lecture: Successful passing of exam, minimum 50 %  Laboratory exercises: complete attendance in the exercise and passing report review</p>																			
11	<b>Weiterführende Veranstaltungen</b> <i>Related courses</i> <ul style="list-style-type: none"> <li>• Semester 1: Material Science</li> </ul>																			
12	<b>Zuordnung</b> <i>Classification</i> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 14.28%;">Mathematik &amp; Naturwissenschaft</th> <th style="width: 14.28%;">Ingenieurwissenschaften</th> <th style="width: 14.28%;">Ingenieur-anwendungen</th> <th style="width: 14.28%;">Entwicklung &amp; Konstruktion</th> <th style="width: 14.28%;">Werkstoffe &amp; Fertigung</th> <th style="width: 14.28%;">Wirtschaft, Management, Sprachen</th> <th style="width: 14.28%;">Anderes</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> </tr> </tbody> </table>						Mathematik & Naturwissenschaft	Ingenieurwissenschaften	Ingenieur-anwendungen	Entwicklung & Konstruktion	Werkstoffe & Fertigung	Wirtschaft, Management, Sprachen	Anderes	X	X	X	X	X		
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X	X	X	X	X																
13	<b>Modulbeauftragter / Lehrpersonen</b> <i>Responsible person / Lecturers</i> Prof. Dr.-Ing. U. Täck																			

Last changes: 22.02.2018