

<b>Module description: Mechanical Systems 1</b>	
<b>Module Code</b>	t.BA.ST.MESY1.19HS
<b>ECTS Credits</b>	4
<b>Language of Instruction/Examination</b>	German
<b>Organizational Unit</b>	IMS
<b>Module Coordinator</b>	Otto Fluder
<b>Legal Framework</b>	The module description is part of the legal basis in addition to the general academic regulations. It is binding. During the first week of the semester a written and communicated supplement can specify the module description in more detail.
<b>Module Characteristic</b>	Type 2a 4 consecutive lecture lessons per semester week and class
<b>Module Description</b>	Statics deals with forces and torques acting on material bodies in equilibrium (not accelerated systems). Several methods exist for determining reactive and internal forces and torques. Statically indeterminate systems are studied through elastostatic relationships on tension and compression bars.
<b>Module Content</b>	<p><b>Fundamental concepts</b></p> <p><b>Concurrent forces</b></p> <p><b>Force Systems and equilibrium of rigid bodies</b></p> <p><b>Centers of gravity</b></p> <p><b>Reactions at supports</b></p> <p><b>Centers of gravity</b></p> <p><b>Forces in beams (shear and moment diagrams)</b></p> <p><b>Static and kinetic friction (general concepts, laws of friction, bolts, jackscrews, belt friction)</b></p> <p><b>Tension and compression in bars</b></p>
<b>Prerequisite Knowledge</b>	vector algebra

# Module description: Mechanical Systems 1

Learning Objectives (Competences)	Students...	Competencies	Taxonomies											
	You are familiar with the basic concepts of the theory of elasticity, such as stress, strain, and Hookes law. You can calculate the load capacity of bars subjected to tension and compression.	M, F	K4											
	You are capable to analyze systems in equilibrium by assuming they are rigid bodies. You will learn how to apply real mechanical systems to simplified models which can be analyzed with mechanical relationships.	M, F	K3											
	You are familiar with the basic concepts and notions of statics. These include space, mass, force, torque, point mass, rigid body and distributed forces.	F	K1, K2											
	You can calculate reaction forces at supports and connections for three dimensional structures in equilibrium.	M, F	K4, K6											
	You can apply your specialized knowledge to real mechanical problems. You can identify your own deficiencies and obtain the required skills by your own.	SE	K3, K4, K6											
	To be prepared for elastostatics you will learn how to calculate internal forces and moments acting on beams and frames. You will learn how to calculate internal forces with equilibrium conditions and how to use differential relationships between load and moments.	F, M	K1, K3, K4											
	You are capable to apply both static and kinetic friction laws and to determine the forces involved between contacting surfaces.	F, M	K4											
<b>Performance Assessment</b>	<table border="1"> <thead> <tr> <th>End-of-module exam</th> <th>Assessment</th> <th>Length (min.)</th> <th>Weighting</th> <th>Form</th> </tr> </thead> <tbody> <tr> <td>written exam</td> <td>Grade</td> <td>90</td> <td>80</td> <td>acc. to module agreement</td> </tr> </tbody> </table>				End-of-module exam	Assessment	Length (min.)	Weighting	Form	written exam	Grade	90	80	acc. to module agreement
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written exam	Grade	45	20	acc. to module agreement										
<b>Classroom Attendance Requirement</b>	None													
<b>Learning material</b>	<ul style="list-style-type: none"> <li>Gross, D. &amp; Hauger, W. &amp; Schröder, J. &amp; Wall, W. (2019). Technische Mechanik 1, Statik. 14 Edition. Deutschland: Springer. ISBN 978-3-662-59157-4. <a href="https://doi.org/10.1007/978-3-662-59157-4">https://doi.org/10.1007/978-3-662-59157-4</a>.</li> <li>Gross, D. &amp; Hauger, W. &amp; Schröder, J. &amp; Wall, W. (2021). Technische Mechanik 2, Elastostatik. 14 Edition. Deutschland: Springer. ISBN 978-3-662-61862-2. <a href="https://doi.org/10.1007/978-3-662-61862-2">https://doi.org/10.1007/978-3-662-61862-2</a>.</li> <li>handouts / One exercise sheet per week with examples will be provided</li> </ul>													
<b>Comments</b>														