



Number of module	Name of module	Lecturer
BIWO-02	Continuum Mechanics, Tensor Calculus	Prof. Zastrau
Content and qualification aim	The module focuses on the fundamental concepts of continuum mechanics and the associated variational principles. Content of the module: <ul style="list-style-type: none">• Tensor algebra• Tensor fields• Kinematics• Balance laws• Material theory• Variational principles After having finished the module successfully students have the necessary background in tensor calculus needed in the context of continuum field theories.	
Type of course	4 hours of lectures, 2 hours of exercises per week, and self-study	
Requirements for study	Knowledge of mathematics corresponding to the level of a completed basic studies course in engineering or natural sciences.	
Practical use of the module	Obligatory module in the Master's programme: Advanced Computational and Civil Engineering Structural Studies. The module provides the prerequisites for the elective modules BIWE-02, BIWE-08 and BIWE-09.	
Requirements for the award of credits	The credits are awarded if the module examination is successfully passed. Depending on a student's decision the module examination consists of either a written examination (90 min) or an oral examination (group examination of up to three students, 20 min per student). The module examination also consists of an ungraded assignment of subtasks (60 h).	
Credits and grades	8 credits can be acquired for this module. The grade is calculated by the weighted arithmetic mean of the partial examination results. The weighting factor of the assignment is one and the weighting factor of the written or oral examination is two.	
Frequency of module	The module is offered every academic year (winter semester).	
Workload	The workload is 240 working hours.	
Duration of the module	1 semester	
Recommended literature	A. Bertram: Elasticity and Plasticity of Large Deformations. An Introduction. G. A. Holzapfel: Nonlinear Solid Mechanics: A Continuum Approach for Engineering. P. Wriggers: Nonlinear Finite Element Methods.	