**BIWO-02: Continuum Mechanics, Tensor Calculus (Prof. Zastrau / Dr. Schlebusch)**

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   - Deformation and motion
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## Prerequisite Knowledge

- Good knowledge in mathematics.
  - Vector spaces and linear transformations
  - Finite-dimensional vector spaces and matrices
  - Normed spaces and Inner product spaces
  - Basics on linear operators
  - Functions of real variables
  - Differentiation
  - Differential operators
  - Integration
  - Integral theorems
  - Differential equations
- Good knowledge in statics and strength of materials
  - Analysis of stress and strain states
  - Equations of equilibrium
  - Equations of compatibility
  - Generalized Hooke's law
  - Strength hypotheses

- Energy principles

**Topics of Project and Master Thesis**

- See topics offered by the Institute of Mechanics and Shell Structures

**Literature**

- A. Bertram: Elasticity and Plasticity of Large Deformations. An Introduction. Springer, Berlin, 2005
- R. Bowen: Introduction to Continuum Mechanics for Engineers. (http://www1.mengr.tamu.edu/rbowen/ )
- R. Bowen: Lecture on Applied Mathematics. Part I: Linear Algebra (http://www1.mengr.tamu.edu/rbowen/ )
- G.A. Holzapfel: Nonlinear Solid Mechanics: A Continuum Approach for Engineering, Wiley, Hoboken, 2000

**Links for possible Topics of Master Thesis**

- Please contact for possible Topics the colleagues of the Institute of Mechanics and Shell Structures directly.