



Contact Mechanics

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Contact interactions are present in many engineering applications. The course presents basic concepts of modern contact mechanics and selected advanced topics.

Main topics:

1. Overview of contact phenomena:
 - rough surfaces and real contact area,
 - contact compliance,
 - friction,
 - lubrication,
 - wear,
 - contact heat transfer,
 - granular materials.
2. Constitutive modeling of contact phenomena, including micromechanical approaches.
3. Continuum contact mechanics:
 - small-strain formulations,
 - finite-deformation formulations,
 - contact problem as a constrained minimization problem,
 - coupled thermo-mechanical contact problems,
 - classical analytical solutions in the theory of elasticity and plasticity.
4. Computational methods for contact mechanics (computational contact mechanics):
 - discretization techniques in the context of the finite element method,
 - treatment of contact constraints.

The total number of lecture hours: 30, laboratory exercises: 0 hours, self-teaching: 40, direct tutoring and consultations: 10 hours.

ECTS Points: 3