Courses in English
Course Description

Department 03 Mechanical, Automotive and Aeronautical Engineering
Course title Impact Simulation of Vehicle Structures
Hours per week (SWS) 4
Number of ECTS credits 6
Course objective After successful completion of this module, the student will have
• Profound understanding of nonlinearities in solid mechanics.
• Profound understanding of solution methods for nonlinear problems.
• Profound understanding of methods for time integration for dynamic problems.
• Ability to choose an appropriate numerical method for the solution of a problem setting in the field of nonlinear dynamics.
• Ability to perform basic impact simulations with a commercial code (lab).
• Ability to validate results of numerical impact simulations and to assess towards plausibility.

Recommended reading
Teaching methods
Assessment methods Exam
Language of instruction English
Name of lecturer Prof. Dr. -Ing. Markus Gitterle
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Link
Course content • Nonlinearities in solid mechanics (general, geometrical nonlinearities, nonlinear materials, contact and friction).
• Methods for numerical treatment of nonlinearities, focal point on contact nonlinearities.
• Methods for discretization in time, implicit and explicit methods, requirements for numerical simulation of highly dynamic problems (impact, crash).
• Application of methods learnt with a commercial code (LS-DYNA), examples with main focus on crash analysis, validation on basis of analytical methods.

Remarks