Course title | Impact simulation of vehicle structures  
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Department | 03 Mechanical, Automotive and Aeronautical Engineering  
Course objective  
- Profound understanding of nonlinearities in solid mechanics.  
- Profound understanding of solution methods for non-linear 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 non-linear 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.  
- Ability to integrate impact/crash simulations into the development process in a constructive manner.  
Recommended reading  
Teaching methods | Lecture, exercise, lab  
Assessment methods | Project Thesis  
Language of instruction | English  
Name of lecturer | Prof. Dr.-Ing. Markus Gitterle  
Email | markus.gitterle@hm.edu  
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