

**Overview - Numerical methods for fluid-structure interaction
(Summer term 2015)**

Technicalities:

- Lecture each Wednesday from 14:00 - 15.30 in room 02.10.011
- Exercises each second week (starting next Monday, Apr 20, 2015)
 - Exercise sheet will be handed-out on which everybody works on. Discussion will be in the subsequent exercise meeting.
- (Hint: Even so that I do not plan to correct individually all exercises, I strongly recommend to work on them for all who consider to obtain the ‘Schein’.)
- On May 18 and May 20 I am not at TUM. I suggest that we meet instead on June 8 for the exercise and on May 11 to have another lecture.

Exam (Schein): Oral exam at the end of the course.

- ECTS credit points: 5
- Duration: 30-40 minutes
- Proposed dates: Jul 16-17, Jul 20-24
- Re-exam (Nachprüfung): Sep 22-25, Sep 28-29.

Contents of this class:

- Challenges of fluid-structure interaction (to sharpen the sense for typical difficulties)
 - Continuum mechanics
 - Modeling of variational-monolithic fluid-structure interaction (FSI) in arbitrary Lagrangian-Eulerian (ALE) coordinates
 - Discretization: Time, space (FEM), nonlinear and linear solvers
 - A posteriori error estimation and mesh adaptivity
 - Sensitivity analysis and optimization (if time permits)
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