Zurich University of Applied Sciences

School of Engineering

t.CFD - Computational Fluid Dynamics (Numerische Strömungssimulation)

Person responsible for the course:	Egon Lang, lang
Responsible OU:	
ECTS:	4
Valid for:	2012/2013
Last saved:	29.05.2013 12:59

Expertise:

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Methodological skills:

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Social skills:

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Personal skills:

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Learning objectives:

The students:
- know the benefits and limitations of numerical simulations
- know how to evaluate simulation results critically
- can apply a systematic approach to simulate fluid flow problems
- can carry out numerical simulations of simple fluid flow problems

Course content:

Lecture:
- Generation of geometric models with the CAD software CATIA
- Generation of grids of various types
- Setting up a simulation (preprocessing) perfoming a simulation (solver)
- Evaluating the results of a simulation (postprocessing) with ANSYS CFX 10
- Interpretation and discussion of the results
- Introduction to the theory of computational fluid dynamics (finite volumes method)

Practical applications:
- Calculation of the fluid flow through a elbow
- Simulation of a simple mixing process
- Simulation of the flow around an airfoil or hydrofoil, computation of the lift and the drag force
- Calculation of the flow and the heat transfer in a pipe
- Simulation of small problem chosen by the students themselves

Previous knowledge:

- Basics of fluid mechanics (aerodynamics) and thermodynamics
- Knowledge of differential equations

Teaching method:

Type of lesson:	Number of lessons per week:
Lecture	14*4
Tutorial/Practicum	
Block instruction	

Assessment:

According to the table or as specified in writing by the lecture at the beginning of the semester!

description	type	form	scope	assessment	weighting
Performance records during school hours	Report and Presentation	Written / orally			
Semester end exam					

Language of instruction:

English

Instruction material:

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Additional literature:

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Comments:

The infrastructure required for this course limits the number of participants to a maximum of 20. Should there be more than 20 participants, the course has to be held in more than one class. Students in Aviation receive a brief introduction to CATIA to ensure that they are capable of producing geometric models.