

<b>Module level</b> Master	<b>Credit points</b> 6	<b>Language</b> English	<b>Return</b> annual
<b>Module designation</b> Computational Fluid Dynamics (CFD)			
<b>Course(s)</b> 1. Methods of Numerical Simulation 2. Mesh generation and Applications			
<b>Code</b>	<b>Subtitle</b>		
<b>Person responsible for the module</b>	Prof. Dr. Andreas Meister, Prof. Dr.-Ing. Olaf Wunsch		
<b>Lecturer</b>	1. Prof. Dr. Andreas Meister 2. Prof. Dr.-Ing. Olaf Wunsch		
<b>Workload</b>	1. Workload: 90 h (15 h online presentation, 45 h private study, 30 h exercise) 2. Workload: 90 h (15 h online presentation, 45 h private study, 30 h exercise)		
<b>Relation to curriculum</b>	Specialist studies, Simulation and Structural Technology, elective		
<b>Type of teaching, contact hours</b>	Skype, virtual classrooms, online presentation, digital communication		
<b>Requirements according to examination regulations</b>	Module Fluid Mechanics		
<b>Recommended prerequisites</b> Modules Fluid Mechanics, Theoretical Fluid Mechanics, Mathematics			
<b>Module objective / intended learning outcomes</b> Students know how to develop and apply methods for numerical simulations.			
<b>Content</b> <b>Methods of Numerical Simulation</b> <b>Part 1</b> Introduction to general numerical methods <b>Part 2</b> Advances in Finite Volume schemes and Applications <b>Mesh generation and Application</b> <b>Part 1</b> Discretization of flow domains and mesh generation (structured/unstructured meshes, grid generation techniques, quality of meshes) <b>Part 2</b> Applications of CFD (simulations of fluid flows in technical apparatus)			
<b>Study and examination requirements and forms of examination</b>	Multiple-choice-test (30min) and online oral examination (30 min) or Written exam (120 min). The examinations are going to 75% (oral examination) of the shares and 25% (Multiple-choice-test) in the final grade of the module.		
<b>Media employed</b>	online script		
<b>Reading list</b> A. Meister, J. Struckmeier: Hyperbolic Partial Differential Equations, Vieweg. C. Hirsch: Numerical Computation of Internal and External Flows, Part 1 and 2, Wiley. E. F. Toro: Riemann Solvers and Numerical Methods for Fluid Dynamics , Springer. R. J. LeVeque: Finite Volume methods for Hyperbolic Problems , Cambridge University Press. D. Kröner: Numerical Schemes for Conservation Laws , Teubner. A. J. Chorin, J. E. Marsden: A Mathematical Introduction to Fluid Mechanics , Springer.			