

Master's Program Computational Engineering Curriculum

		Code	Module Name	hours per week	CP	Semester
1 st & 2 nd semester	P Compulsory Courses 39 CP	CE-Po1	Mathematical Aspects of Differential Equations and Numerical Mathematics	4	6	1
		CE-Po2	Mechanical Modeling of Materials	4	6	1
		CE-Po3	Computer-based Analysis of Steel Structures	4	6	1
		CE-Po4	Modern Programming Concepts in Engineering	4	6	1
		CE-Po5	Finite Element Methods in Linear Structural Mechanics	4	6	1
		CE-Po6	Fluid Dynamics	2	3	2
		CE-Po7	Continuum Mechanics	4	6	2
Subtotal CP: Compulsory Courses					39	
1 st , 2 nd & 3 rd semester	WP Compulsory Optional Courses 35 CP	CE-WPo1	Variational Calculus and Tensor Analysis	3	5	1
		CE-WPo2	Optimization Aided Design - Reinforced Concrete	4	6	2
		CE-WPo3	Adaptronics	3	5	2
		CE-WPo4	Advanced Finite Element Methods	4	6	2
		CE-WPo5	Computational Fluid Dynamics	4	6	2
		CE-WPo6	Finite Element Methods for Nonlinear Analyses of Materials and Structures	2	3	2
		CE-WPo8	Numerical Methods and Stochastics	4	6	2
		CE-WPo9	Numerical Simulation in Geotechnics and Tunneling	4	6	2
		CE-WPo10	Object-oriented Modeling and Implementation of Structural Analysis Software	2	3	2
		CE-WPo11	Applied Computational Simulations of Structures	4	6	2
		CE-WPo12	Computational Plasticity	4	6	2
		CE-WPo25	High-Performance Computing on Multicore Processors	4	6	2
		CE-WPo28	Machine Learning: Supervised Methods	4	6	2
		CE-WPo13	Advanced Control Methods for Adaptive Mechanical Systems	4	6	3
		CE-WPo14	Computational Wind Engineering	2	3	3
		CE-WPo15	Design Optimization	4	6	3
		CE-WPo17	Numerical Methods for Conservation Laws	4	6	3
		CE-WPo18	Safety and Reliability of Engineering Structures	4	6	3
CE-WPo19	Computational Fracture Mechanics	4	6	3		
CE-WPo20	Materials for Aerospace Applications	4	6	3		
CE-WPo26	High-Performance Computing on Clusters	4	6	3		
CE-WPo24	Case Study A	2	3	2+3		
Minimum Subtotal CP: Compulsory optional courses					35	
1 st , 2 nd & 3 rd semester	W Optional Courses 16 LP	CE-Wo1	Training of Competences (part 1)	4	4	1
		CE-Wo9	Scientific C++ Programming (Basics)	2	3	1
		CE-Wo2	Training of Competences (part 2)	4	4	2
		CE-Wo4	Recent Advances in Numerical Modeling and Simulation	2	2	2
		CE-Wo5	Machine Learning: Evolutionary Algorithms	4	6	2
		CE-Wo6	Advanced Constitutive Models for Geomaterials	2	3	2
		CE-Wo10	Scientific C++ Programming (Advanced)	2	3	2
		CE-Wo8	Quantum Computing	2	3	3
		CE-Wo3	Case Study B	2	3	2+3
other relevant courses of the faculty or from engineering faculties of other universities						1+2+3
Minimum Subtotal CP: Optional Courses					16	
4 th Semester	M Master-Thesis	CE-M	Master Thesis	-	30	4
		Subtotal CP: Master Thesis				
Subtotal CP: Compulsory Courses					39	
Subtotal CP: Compulsory optional courses					35	
Subtotal CP: Optional courses					16	
Subtotal CP: Master Thesis					30	
Sum CP in total:					120	