

Integrated Civil Engineering Systems

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Civil Engineering Structures			Modelling and Forecasting		
Profile Courses (30 EC)	EC	Quartile	Profile Courses (minimum 30 EC)	EC	Quartile
Legal & Governance Aspects	7,5	1	Statistics and Probability (IEM) 191506103	5	1
Sustainability & Circularity in Civil Engineering	5	1	Simulation (IEM)	5	1
Morphology	5	2	Research Methodology & Academic Skills	5	2
Research Methodology & Academic Skills	5	2	Data Science (CSC)	5	2 or 3
Geo Risk Assessment	5	3	Data Analysis in Water Engineering & Management	5	2
Hydraulic Engineering	5	3	Hydrological Modelling & Forecasting	5	2
Advanced Soil Mechanics	5	4	Mathematical Optimization (DMMP)	5	3
			Network Equilibrium Analysis	5	4
Profile Electives			Profile Electives		
<p>- Free to choose any of the CEM-courses (pay attention to the required prior knowledge) - Below: list of CEM-courses that fit best in this profile (in addition to profile courses)</p> <p>- Below: courses from other programmes that fit in this profile (If you include courses from other programmes, we recommend you to make a selection, such that the majority of the programme is still formed by CEM-courses)</p>			<p>- Free to choose any of the CEM-courses (pay attention to the required prior knowledge) - Below: list of CEM-courses that fit best in this profile (in addition to profile courses)</p> <p>- Below: courses from other programmes that fit in this profile (If you include courses from other programmes, we recommend you to make a selection, such that the majority of the programme is still formed by CEM-courses)</p>		
BIM and 5D Planning	5	2	Hydrology	5	1
Data Analysis in Water Engineering and Management	5	2	Long Waves and Tidal Morphodynamics	5	1
Experiments in Water Infrastructure	5	2	Short Waves and Coastal Dynamics	5	1
Mathematical Physics of Water Systems	5	3	Morphology (prior knowledge: Long & Short Waves)	5	2
Systems Engineering in Construction	5	3	Mathematical Physics of Water Systems	5	3
Subsurface Infrastructure Engineering	5	4	Regional Flood Management	5	3
			River Morphodynamics	5	4
			Traffic Operations	5	1
			Modelling Consumer Behaviour (IDE)	5	1
			Network Modelling & Forecasting	5	2
			Choice Modelling	5	2
			Public Transport Modelling	5	3
			Data Science Additional Topics (CSC)	5	3
			Traffic Management	5	4
			Building Information Modelling & 5D Planning	5	2
			Simulation and Optimization of Construction Processes	5	3
			Subsurface Infrastructure Engineering	5	4
Introduction to Finite Elements (part mod11 WB)	± 3	3	Numerical Methods in ME (ME; prior knowledge: Intro FE)	5	1 or 2
Numerical Methods in ME (ME; prior knowledge: Intro FE)	5	1-2	Discrete Optimization (AM)	5	1 or 2
Linear Solid Mechanics (ME)	5	3	Optimization Modelling (AM)	5	3
Nonlinear Solid Mechanics (ME; prior knowledge: Intro FE)	5	4	Scientific Computing (AM)	5	3 or 4
Dynamica 2 & knik (mod 8 WB)	± 4,5	4	Introduction to Finite Elements (part mod11 WB)	5	3
Structural Health and Condition Monitoring (ME)	5	4	Introduction to Partial Differential Equations (AM)	5	3
Failure Mechanisms & Life Prediction (ME)	5	2	Applied Finite Elements for PDE (AM)	5	3 or 4
Data Science (EWI)	5	2 or 3			
Sustainability			Smart Cities		
Profile Courses (30 EC)	EC	Quartile	Profile Courses (30 EC)	EC	Quartile
Water Footprint Assessment	5	1	Planning & Process Management	5	1
Sustainability and Circularity in Civil Engineering	5	1	Sustainability and Circularity in Civil Engineering	5	1
Planning & Process Management	5	1	Research Methodology & Academic Skills	5	2
Research Methodology & Academic Skills	5	2	Land Use and Transport Interactions	5	3
Water and Energy	5	2	Water Management and Governance for Engineering	5	3
Land Use and Transport Interactions	5	3	Sustainable Transport	5	4
Water Management and Governance for Engineering	5	3	Urban Water Management	5	4
Sustainable Transport	5	4	Urban Governance and Resilience for Smarter Cities (2019-2020)		
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Water and Energy	5	2	Water Footprint Assessment	5	1
Water and Climate	5	4	Water and Energy	5	2
Building with Nature	5	4	Regional Flood Management	5	3
Urban Water Management	5	4			
			Public Transport Modelling	5	2
			Data Science (CSC)	5	2
			Traffic Management	5	4
			Smart City Engineering (2019-2020)		
			Transport in Smart Cities (2019-2020)		
			Value Management	5	4
			Building Information Modelling & 5D Planning	5	2
			Systems Engineering in Construction	5	3
			Subsurface Infrastructure Engineering	5	4
			Infrastructure Asset Management	5	4
			Infrastructure Maintenance Machines	5	4
			Energy Conversion Technology (ME)	5	1
			Life-Cycle Strategy (ME)	5	1
			Policy Instr and Evaluation in Environm+Sust. (PA)	5	3
			Economic Methods of Sustainability Assessment (PA)	5	1
			Policy Strat.&Impl. for Water Govern+Sust. Issues (PA)	4	1
			Product Life Cycle (IDE)	5	2
			Electrical Power Engineering + System Integration (SET)	5	2
			Energy management, policy and technology (MEEM)	4	2
			Energy, Sustainability and Society (SET)	5	3
			Wind Energy (SET)	5	3
			Solar Energy (SET)	5	3
			Energy Storage (SET)	5	4
			Data Science (EWI)	5	2 or 3
Free Electives (max 15 EC)					
Any course from UT or approved other university*	EC	Quartile	Any course from UT or approved other university*	EC	Quartile
Thesis **					
Preparation Master Thesis	EC	Quartile	Preparation Master Thesis	EC	Quartile
Preparation Master Thesis	5 or 10	-	Preparation Master Thesis	5 or 10	-
Master Thesis Construction/Traffic/Water	30	-	Master Thesis Construction/Traffic/Water	30	-
ING AND CONSULTATION FOR THE MASTER PROFILES					
Track-coordinator: dr. Jord Warmink					
Coordination of Master Theses: see coordinators from CME, TEM or WEM					