M 6.1: Virtual Reality and Optimization in Environmental Engineering

Responsible for the module:	NN (Substitute Prof. Dr. Jürgen Knies)		
ECTS credits:	6 ECTS	**Total workload:**	180h
Use of the module in this degree programme:	Compulsory elective module at 6. Semester	**Of which face-to-face studies:**	60h
Duration and frequency of the offer:	14 Dates in SoSe	**Of which self-study:**	120h
Use of the module in other degree programmes or scientific courses. Further education courses:			

Learning outcomes:

Knowledge and understanding (broadening knowledge, deepening knowledge, understanding knowledge)

- *The students understand the application reference of VR/AR in the context of environmental technology*
- *The students explain the application areas of VR/AR (context plants, context infrastructure)*
- *The students know the basics of CAE*

Use, application and generation of knowledge (utilisation and transfer, scientific innovation)

- *After completing the module, students are able to use VR/AR models specifically for the design of plants and infrastructures and their optimisation using CAE.*
- *The students can carry out VR/AR applications and model the data required for this purpose.*
- *Students analyse systems and infrastructures with the help of VR/AR and identify potential for improvement.*
- *Students modify and optimise the digital models based on their analysis.*

Communication and cooperation

- *Students learn to assess the significance of different visualisations*

Scientific self-image or professionalism

- *Students justify their decision-making regarding the design and optimisation of facilities and infrastructures in a fact-based and transparent manner.*

Teaching content:

Please name the central subject-related, methodical, practical and/or interdisciplinary contents.

- *Basics VR/AR applications and data modelling*
- *Basics or advanced CAD/CAE - applications and data modelling*
- *Visualisation of plants, infrastructures and processes*
- *Determination of boundary conditions and requirements*
- *Development of optimisation strategies*
- *Evaluation of optimisation strategies and results*

Language of instruction:	English
Participation requirements:	
Preparation/Literature:	*Current literature lists are handed out at the beginning of the semester.*
Further information:	*Learning materials on Aulis*

Related courses

Title of the course	Lecturer	SWS	Teaching and learning methods	Forms, scope and duration of examinations
Virtual Reality	NN	3	Seminar	Portfolio (PF)
Digi-Lab VR	NN	1	Laboratory	

Module-related tutorial	NN	(1)	Guided self-study	