Module number	Module name	Module coordinator
3030145	Remote Sensing in Water Resource Management	Univ.-Prof. Dr.-Ing. Holger Schüttrumpf schuettrumpf@iww.rwth-aachen.de
		Other: Prof. Antara Dasgupta PhD
Learning goals	Students will learn to download, process, and visualize satellite data for water resource applications. The module covers remote sensing principles, advantages of satellite use, data visualization techniques (e.g. time series, histograms), and exporting summaries. Students will gain practical skills using tools like ArcGIS, QGIS, MATLAB, and Python, and learn to assess satellite data quality and integrate it into hydrological modeling.	
Content	This course explores the use of remote sensing for monitoring and managing water resources, which are increasingly impacted by climate change. It covers satellite-based observation of key hydrological components such as precipitation, soil moisture, runoff, water quality, and groundwater. Students will learn about existing remote sensing products, their physical principles, and how to search, download, and process data using open-source tools (e.g. SNAP, QGIS, Google Earth Engine) and programming languages (Python, JavaScript). Applications in land use, erosion, and water quality are also briefly discussed.	
Teaching and learning methods	4 SWS Lecture and self-study.	
Prerequisites	None	
(recommended) Requirements	Basics of hydrology, hydrological modelling and GIS. Basics of GIS software ArcGIS or QGIS. Basics of programming in Matlab and/or Python. Ability to literature review and critical thinking of scientific journal papers.	
Language	English	
Applicability	Compulsory elective module in the Master's program Civil Engineering.	
Requirements for earning credit points	Graded written examination. Prerequisite for participation in the written examination: passed term paper.	
Credit points and grades	5 ECTS Credits	
Module frequency	The module is offered every academic year in summer semester.	
Workload	The total workload is 150 hours.	
Module duration	The module lasts one semester.	