Faculty	**Architecture, Civil and Environmental Engineering**
Course Title	Remediation Technologies
Number of ECTS credits	6
Hours per week (SWS)	5
Semester	Autumn Term (Winter Semester)
Course objective	By passing of this module, students are able to understand the fundamentals of environmental remediation practices and technologies. They are able to: • Describe the characteristics of soils in terms of construction and environmental purposes • Understand fundamentally the behaviour of water molecules and relevant pollutants in the soil system as well as interactions between particles, air and water • Select methods to study soil, groundwater and soil air and to evaluate the results • Apply unit operations of process engineering to the purification of air, water and soil • Understand decision-making processes for the assessment of suspected contaminated sites and to use evaluation criteria profession-ally • Plan and carry out the processing of solid samples and analysis of soil parameters, to evaluate the data, to interpret it and to document the same in laboratory reports

Prerequisites	None; however, modules of the 2nd year of study in ISU (Bachelor) or equivalent knowledge and skills are recommended
Recommended reading	Neumaier, Weber: Altlastensanierung Franzius: Handbuch der Altlastensanierung und Flächenmanagement Held: In-Situ-Verfahren zur Boden- und Grundwassersanierung
Teaching methods	Seminars, lab, module-related tutorial
Assessment methods	Written exam, 90 minutes (PL) or experimental work (PL) oral exam, 30 minutes (SL)
Language of instruction	English
Name of lecturer	Prof. Dr.-Ing. Anja Noke
Email	anja.noke@hs-bremen.de
Link	https://www.hs-bremen.de/mam/hsb/fakultaeten/F2/U/u5.2_reme_remediation_technologies.pdf

Course content	The module conveys methods and processes for the investigation, evaluation and remediation of contaminated sites. In detail, the following aspects are covered: • Soil properties: Soil physical and soil mechanical properties, tensions in the soil, deformation of the subsoil (soil settlements), movement of water and pollutants in the soil • Exploration of contaminated sites and remediation planning: Over view of the remediation of contaminated sites from identification to exploration as well as evaluation and follow-up, to the legal aspects and the organizational structure of remediation of contaminated sites, on-site investigations, and remediation processes • The remediation process: Procedures for the protection and decontamination of contaminated sites and possible applications depending on the type of contamination, development of remediation concepts • Evaluation of remediation procedures, selection and plant design, and development of planning fundamentals on the basis of practical examples • Assessment of soils: Planning, implementation and evaluation of experimental methods on selected examples, identification and assessment of soils, effects on the use and treatment of soils