

Modulbezeichnung		Master Green Engineering Modul 9 Wahlpflichtmodul Geothermal Energy	
Verwendbarkeit		Master Green Engineering - Nachhaltige ET+VT für die Bioökonomie	
Lernziele / Kompetenzen		Students ... - learn about basic geological concepts (permeability, porosity, faults, fractures etc.). - become aware of the role of geothermal energy, its potential and limitations. - differentiate and compare shallow and deep geothermal systems. - learn about different drilling equipment and technics. - understand geological and technical prerequisites for geothermal energy in Göttingen. - can assess economic parameters of geothermal systems.	
Lehrinhalte		- Introduction and general aspects including: geothermal energy as energy source; geothermal potential and current status; geothermal systems classification. - Shallow geothermal energy including: open- and closed-loop systems and underground thermal energy storages; installation of borehole heat exchangers; heat pumps. - Geothermal energy in Göttingen: potential, risks, challenges (bike excursion including different locations in the north campus related to geothermal energy) - Deep geothermal energy including: drilling equipment and technics; stimulation of low-permeability reservoirs; different types of deep geothermal plants. - Excursion to the laboratory of the Geoscience Center Göttingen (GZG): introduction to the basic geological concepts; laboratory methods of measuring thermophysical properties of ground; microscopic analysis of porosity of rocks; test field with shallow boreholes. - Economic aspects of geothermal systems including: main indicators of project profitability; economic parameters in the context of geothermal projects; risks and uncertainties.	
Lehr- und Lernformen		Seminar / Field trip	
Modulsprache		English	
Voraussetzungen		Formal: none Inhaltlich: basics of energy technology	
Prüfungsleistung		Präsentation (PR)	
Kreditpunkte		3	
Arbeits- aufwand	Präsenzzeiten	30	
	Selbststudium	60	
Schwerpunkte im Selbststudium		- Pre- and post-processing of seminars - Literature research - Preparation of a presentation	
Angebot des Moduls		Wintersemester	
Modulverantwortliche/r		Dr. Romanov	
Lehrende/r		Dr. Romanov	