Modulbezeichnung	**Regenerative Energien 1**
Semester	4
ECTS-Punkte (Dauer)	7 (1 Semester)
Art	Pflichtfach Energieeffizienz und Vertiefung Umwelttechnik, Wahlpflichtfach Chemietechnik
Studentische Arbeitsbelastung	90 h Kontaktzeit + 120 h Selbststudium
Voraussetzungen (laut BPO)	
Empf. Voraussetzungen	
Verwendbarkeit	BaSES, BaCTUT
Prüfungsform und -dauer	Klausur 2h oder mündliche Prüfung oder mündliche Präsentation und schriftliche Dokumentation
Lehr- und Lernmethoden	Vorlesung
Modulverantwortlicher	I. Herraez

Qualifikationsziele

The students are familiar with the physical principles governing the energy extraction from the wind and the generation of solar thermal energy. They can estimate the potential of a given site for both wind energy and solar thermal applications. They are familiar with the main components of wind turbines and solar thermal installations and are capable to perform a basic design of both types of systems. Furthermore, they are also familiar with the blade element momentum theory and can apply numerical models based on it for computing the loads and estimating the performance of wind turbines. The lectures will be held in English in order to promote the skills required to work in an international environment.

Lehrinhalte

- Solar thermal energy : physical principles, main components, design, efficiency, potential, costs
- Wind turbines: physical principles, main components, design, efficiency, potential, costs
- Simulation of wind turbines: blade element momentum theory, wake induction, loads, engineering correction models, aeroelasticity, numerical models.

Literatur

- Hau, E.: Wind turbines, Springer, 2013.
- Gash, R. and Twele, J.: Wind power plants, Springer, 2012
- Eicker, U.: Energy Efficient Buildings with Solar and Geothermal Resources, Wiley, 2014.

Lehrveranstaltungen

Dozent	Titel der Lehrveranstaltung	SWS
I. Herraez	Solar thermal energy	2
I. Herraez	Wind turbines	2
I. Herraez	Simulation of wind turbines	2