Courses in English
Course Description

Department 09 Engineering and Management

Course title Seminar on Renewable Energy for a Sustainable Future

Hours per week (SWS) 3

Number of ECTS credits 4

Course objective

Competence Level 1 „Know“:
• The students know how distinct technologies in the power generation sector affect the world climate.

Competence Level 2 „Understand“:
• The students have insight into the complex interaction between electricity demand, generation and storage.

Competence Level 3 „Apply“:
• The students can classify energy demand and generation according to the magnitude of their energy and power values.

Competence Level 4 „Analyse“:
• The students can perform an efficiency analysis of renewable technologies.

Competence Level 5 „Evaluate“:
• The students can interpret the results of their analysis and give recommendations based on their results.

Prerequisites

Basic knowledge of Physics.

Recommended reading

USHER, Bruce, 2019. Renewable Energy: A Primer for the Twenty-First Century, New York: Columbia University Press,
ISBN: 9780231547529

DEMIREL, Yasar, 2021. Energy - Production, Conversion, Storage, Conservation, and Coupling, Cham: Springer,


Recent publications will be provided by the lecturer.

Teaching methods Seminar

Assessment methods Modularbeit modA:
Student groups (up to 3 persons) will present (20 min.) and comment one publication on a specific topic. During the semester the learning progress will be monitored by several IT-supported tests. Further details will be communicated by the lecturer during the first lesson.

Language of instruction English

Name of lecturer Prof. Dr. rer. nat. Markus Mauerer

Email markus.mauerer@hm.edu

Link
Course content

The seminar will focus on various topics relevant for climate change and sustainable power generation (and use), thereby following the concept of blended learning.

Procedure in each individual topic is as follows:

• Introduction of the basic concept
• Training and exercises in groups
• Group presentation of a recent article

The seminar will be accompanied by a learning app, experiments (also in labs) and if possible by excursions, e.g. to power stations.

Example topics are:

• CO2 sources and the effect on the climate
• Transition to a sustainable energy system
• Energy storage systems
• Solar battery systems – a step towards self-sufficiency
• Next generation wind turbine technology
• Power-to-X technologies
• Emerging photovoltaic technologies
• Energy management systems

Remarks