

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	<p>Competence Level 1 „Know“:</p> <ul style="list-style-type: none">• The students know how distinct technologies in the power generation sector affect the world climate. <p>Competence Level 2 „Understand“:</p> <ul style="list-style-type: none">• The students have insight into the complex interaction between electricity demand, generation and storage. <p>Competence Level 3 „Apply“:</p> <ul style="list-style-type: none">• The students can classify energy demand and generation according to the magnitude of their energy and power values. <p>Competence Level 4 „Analyse“:</p> <ul style="list-style-type: none">• The students can perform an efficiency analysis of renewable technologies. <p>Competence Level 5 „Evaluate“:</p> <ul style="list-style-type: none">• The students can interpret the results of their analysis and give recommendations based on their results.
Prerequisites	Basic knowledge of Physics.
Recommended reading	<p>USHER, Bruce, 2019. Renewable Energy: A Primer for the Twenty-First Century, New York: Columbia University Press, Available online: https://www.degruyter.com/document/doi/10.7312/ushe18784/html ISBN: 9780231547529</p> <p>DEMIREL, Yasar, 2021. Energy - Production, Conversion, Storage, Conservation, and Coupling, Cham: Springer, Available online: https://doi.org/10.1007/978-3-030-56164-2, ebook ISBN 978-3-030-56164-2</p> <p>EVERETT, Bob, Godfrey BOYLE, Stephen PEAKE and Janet RAMAGE, 2012. Energy Systems and Sustainability, New York: Oxford University Press, ISBN: 9780199593743</p> <p>Recent publications will be provided by the lecturer.</p>
Teaching methods	Seminar
Assessment methods	<p>Modularbeit modA:</p> <p>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.</p>
Language of instruction	English
Name of lecturer	Prof. Dr. rer. nat. Markus Mauerer
Email	markus.mauerer@hm.edu
Link	

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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