

Sustainable Energy Systems, MB 601, MB 602

Keywords:

Renewable Energy, Energy Carriers, Energy Storage, Sustainability, Energy Efficiency, Hydrogen, Fuel Cell

Target Group(s):	6. Semester	
Workload:	8 ECTS-Credits	(240 hours)
thereof	Contact hours	120 hours
	Self study	80 hours
	Exam preparation	40 hours
Language of instruction:	english	
Module owner:	Prof. Dr.-Ing. Rainer Stauch	
Date:	29.10.2018	

Prerequisites:

Thermodynamics 1

Total Target:

Achieving a fundamental knowledge about: renewable energies, sustainability and the use of hydrogen as an energy carrier. Achieving the knowledge to design and calculate sustainable, effective and decentralized systems converting and storing energy.

Module Content:

Renewable energy sources like solar, wind, hydropower, geothermal, bio-fuels and biomass; energy storage; generation and use of hydrogen; sustainability, efficient power cycles, concept of exergy, environmental impacts, Life Cycle Assessments.

Reference material:

lecture notes

M. Kaltschmitt, W. Streicher, A. Wiese. Renewable Energy. Springer, 2007

D.J.C. MacKay. Sustainable Energy – without the hot air. UIT, 2009

J.W. Tester, E.M. Drake, M.J. Driscoll, M.W. Golay, W.A. Peters. Sustainable Energy – Choosing Among Options. MIT Press, Cambridge, 2005

V. Wesselak, T. Schabbach, T. Link, J. Fischer. Handbuch Regenerative Energietechnik. 3rd edition, Springer, 2017

Offered:

every semester

Relevance for other study programs:

Energy engineering, environmental engineering, supply engineering

Content and type of Assessment:

Renewable Energy Sources and Carriers:

Form of learning: lectures, practices and exam preparation

Semester periods per week: 4 hours

Workload: 120 hours

Targets: Achieving a fundamental knowledge about: renewable energies and energy carriers (e. g. the use of hydrogen as an energy carrier).

Sustainable, Efficient and Decentralized Energy Systems:

Form of learning: lectures, practices and exam preparation

Semester periods per week: 2 hours

Workload: 60 hours

Targets: Achieving the knowledge to design and calculate sustainable, effective and decentralized systems converting and storing energy. Implementing Life Cycle

Assessments

Laboratory Sustainable Energy Systems:

Form of learning: practices in laboratory

Semester periods per week: 2 hours

Workload: 60 hours

Targets: Deepening and using the knowledge obtained in the lectures.

Assessment:

Renewable Energy Sources and Carriers: Written examination (120 minutes),

Sustainable, Efficient and Decentralized Energy Systems: Written examination (60 minutes),

Laboratory Sustainable Energy Systems: Certificate