

<b>Course:</b>	<b>Energy Efficiency</b>	<b>Course Code</b>
<b>Module:</b>	Compulsory Elective Module I	EM CEM 1.2

<b>Head of the module:</b>	Prof. Dr Verena Rath	<b>Dozent/in:</b>	Prof. Dr Jochen Weilepp
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<b>Part of studies:</b>	One	<b>Semester hours per week:</b>	4
<b>Semester:</b>	Three	<b>Workload:</b>	180 h
<b>Status:</b>	Compulsory elective subject	<b>Credits:</b>	6
<b>Frequency:</b>	Every second semester	<b>Assessment:</b>	Seminar paper
<b>Taught in:</b>	English		

**Breakdown of the total workload:**

On-campus studies	Excursion	Self-study	Assessment
45 h	0 h	135 h	-

**Prerequisites:**

The knowledge of business economics taught in the modules "Business Administration" (Module IV) and "Economics" (Module V) and "Fundamentals of Accounting" (Module VI) is expected. Equally, the energy management contents of "Fundamentals of Energy Management" (Module XI) and "Energy Conversion Technologies" (Module XII) are relevant and are required to be known.

**Qualification objectives:**

The students know what is to be understood by energy efficiency and how it can be measured. They understand the difference between production-side and consumption-side energy efficiency. The possibilities the producers have to increase their degree of efficiency, how the degrees of efficiency have developed over the course of time and where the current feasibility limits lie is known. Concepts for heat utilisation from combined heat and power systems for more efficient management can be evaluated. Methods for users to increase efficiency in buildings, vehicles, electrical devices, etc., are known. The students understand how to judge suggestions in these fields and are able to elaborate solutions for increasing efficiency further on their own. Examples of application from the industry deepen the understanding of the various efficiency measures.

In a separate section, the students become familiar with the various methods of storing electricity and are able to estimate them with regard to their energy efficiency and optimal field of application.

In an outlook, the students understand the increasing significance of IT systems for targeted energy efficiency measures and are able to establish the cross-network of content to another topic of the future "Smart Energy/Smart Grids".

**Content of teaching:**

- The basics
- Data collection for a status quo analysis
- Generic methods for reducing energy consumption
- Interdisciplinary technologies with a high energy efficiency potential
  - Producer side
  - Consumer side
  - Energy recycling
- Energy efficiency measures in energy-intensive industries
- Energy storage technologies
- Outlook: Energy efficiency and IT/Smart Grids

<b>Lecture material:</b>	Script online in Ilias, supplementary handouts as and when required
<b>Recommended reading:</b>	Hesselbach J.: Energie- und klimaeffiziente Produktion, Springer Fachmedien, Wiesbaden 2012
	Blesl, M. / Kessler, A.: Energieeffizienz in der Industrie, Springer Verlag, Berlin / Heidelberg 2013
	Pehnt, M.: Energieeffizienz – Ein Lehr- und Handbuch, Springer Verlag, 2010
	Wosnitza, F. / Hilgers, H.G.: Energieeffizienz und Energiemanagement, Springer Spektrum, 2012
	Servatius, H.-G. / Schneidewind, U. / Rohlfing, D.: Smart Energy, Springer Verlag, 2012