pre366 - Solar Low Temperature

Module label: Solar Low Temperature
Module code: pre366
Credit points: 7.0 KP
Workload: 210 h

Used in course of study:
- Master's Programme European Master in Renewable Energy (EUREC) > Mastermodule

Contact person

Skills to be acquired in this module:
At the end of the module the student will:
- understand the principles of operation, design and methods of low temperature solar energy use: building heating and cooling, microgeneration systems.
- be aware of the potentialities of solar resource for energy saving in building
- be aware of the solar heating and cooling technologies
- understand the different solar collector technologies
- understand the thermodynamics of energy conversion systems
- be familiar with the utilization of different numeric tools for heating systems design, performance evaluation and techno-economic viability
- have a critical understanding of the physical principles relating to the operation and design of solar collectors.
- be able to compare the design and operation of solar heating and/or cooling systems in buildings
- will have a critical understanding of the complete system efficiency on the basis of sub-systems efficiency limitation.

Module contents:
1. Solar Collectors theory and technologies
   - The solar resource
   - Direct and indirect irradiance
   - Mask effects
   - Solar collectors theory
   - Plate collectors
   - Evacuated collectors
   - Low concentrated collectors
   - Solar collectors technologies and application
   - Design software for implantation in buildings.
2. Solar Conversion (solar heating/cooling, microgeneration)
   - Thermodynamics optimisation : exergy analysis
   - Potentialities of low temperature solar energy for cooling
   - Potentialities of low temperature solar energy for electricity production
   - Heat driven cooling system theory and technologies
   - Liquid absorption system
   - Solid sorption systems
   - Microgeneration : ORC and Stirling systems

Reader's advisory:

Links

Language of instruction: English
Duration (semesters): 1 Semester
Module frequency: jährlich
Module capacity: unlimited
Modulart: je nach Studiengang Pflicht oder Wahlpflicht

Vorkenntnisse / Previous knowledge:
Lectures, Tutorials, Laboratories, Excursions

Examination:
Time of examination: Written exam: End of the Semester / end of May
Type of examination: Written exam (50 %): 2 hours
Written report: during the semester / February to May
Written report (50 %): extended laboratory report, 10-20 pages

Course type: Seminar

SWS
Frequency
Workload attendance: 0 h