pre325 - Wind Potential, Aerodynamics & Loading of Wind Turbines

Module label: Wind Potential, Aerodynamics & Loading of Wind Turbines
Module code: pre325
Credit points: 7.5 KP
Workload: 225 h

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

Contact person:

Entry requirements:

Skills to be acquired in this module:
- possess advanced knowledge on wind potential, aerodynamics and loading of wind turbines
- be skilled in simulation programs for design and control of Wind Turbines (GH Bladed), practical experience
- be skilled in wind potential evaluation, wind farm design and environmental impacts using simulation programs (GH WindFarmer),
- have an understanding of economic parameters for a successful project realisation

At the completion of this module, the student will:

Module contents:
1. Introduction
   - Status of Wind Energy
   - Status of European Wind Energy and R&D
2. Advanced Wind Structure and Statistics
   - Gusts and gust probability distributions
   - Effects of topography
3. Evaluation of Wind Energy Potential
   - Wind modelling in flat and complex terrain
   - Wind energy siting approaches
4. Wind Turbine Aerodynamics
   - Advanced methods
   - Aerodynamic stall
   - Unsteady aerodynamics
   - Vortex wake structure
   - Advanced wake models
   - Optimum design of wind turbine blades
5. Static and Dynamic Loading of Wind Turbines
   - Aerodynamic and gravity loading
   - Inertial and structural loads
   - Aeroelastic modelling
   - Fatigue of wind turbine blades

Reader's advisory:

Links:
Language of instruction: English
Duration (semesters): 1 Semester
Module frequency: jährlich
Module capacity: unlimited
Module level: MM (Mastermodul / Master module)
Modulart: je nach Studiengang Pflicht oder Wahlpflicht
Lern-/Lehrform / Type of program: Lectures, Tutorials, Workshop, Laboratory

Examination:
Final exam of module: Exam week (end of May)
Time of examination: Written exam (3 hours)
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