pre375 - Smart Grids

Module label: Smart Grids
Module code: pre375
Credit points: 4.5 KP
Workload: 135 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:
By the end of this module, students should be able to program and protect smart grids. Students will get a suitable knowledge on:
- Smart grid concept and development
- Protection system in electrical power systems
- Telecommunication infrastructure in smart grids

Engineering design:
Graduates will be able to design engineering solutions to the challenge of programming smart-grids. They will be able to do the complex task of coordinating protective devices for RE, integrate mini and micro generation in distribution grids or plan and optimise primary-secondary distribution systems.

Transferable skills:
Graduates will be able to work effectively as a professional and as team member in the resolution of technical problems related to integration of RE in electric grids. Also, graduates will demonstrate their abilities to communicate effectively in multinational groups.

Module contents:
1. Programming of intelligent networks
   - Smart Grids from the point of view of the network operator (Demand Management, Electric Vehicle, Storage...)
   - Operation and network planning with quality criteria distribution
   - Optimization Techniques
   - Practice microgrids
2. Protections
   - Introduction
   - Overcurrent protection
   - Distance protection
   - Differential protection
   - Protection coordination
   - Problematic of distributed generation
3. Smart Grids
   - IEC 61850 communications
   - Visit to Red Electrolica de Espana control center
   - Visit to UFD facilities: Smart grids projects
   - PLC communications: Malaga Smart city experience
   - Visit to ERZ control center: smart meters

Reader's advisory:

Links:

Language of instruction: English
Duration (semesters): 1 Semester
Module frequency: jährlich
Module capacity: unlimited
Modullevel: MM (Mastermodul)
Modulart: Pflicht

Vorkenntnisse / Previous knowledge:

Course type: Seminar

Examination:
Final exam of module: Time of examination: After end of lectures of module
Type of examination:
Written exam (50%): 2 hours
Subject's work (10%): approx. 4 hours
(Subject’s work refers to the different assignments that students are asked to finish after a preliminary session during the lessons)
Presentation (40%): 20 minutes (developed topic)
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