pre331 - Ocean Energy Resources

Module label: Ocean Energy Resources
Module code: pre331
Credit points: 6.0 KP
Workload: 180 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:
- have an understanding of the physical mechanisms in the ocean which are on the basis of the
generation of surface waves, tides and currents, and their effects, as well as the biological processes
that may affect or be affected by ocean energy devices.
- be familiar with the statistic description of waves and currents
- be able to use the statistical information in order to make evaluation of the energy resource
- be able to use GIS for site selection characterization.
- Introduction to the ocean environment: ocean water and geology; ocean circulation and
stratification; ocean habitat; ocean economy.
- Ocean surface waves: linear wave theory (regular and random waves); wave spectrum; wave
energy resource: parametrical characterisation of ocean waves, nearshore wave transformation,
wave measurement and modelling.
- Other sources of ocean energy: ocean tidal currents (current measurement; current turbulence;
current energy resource); ocean thermal energy conversion; ocean salinity gradient energy resource.
- Site selection and characterization for ocean energy systems: criteria on energy resource, expected
cost levels, water depth, seabed geology and ecology, distance to shore, ports, O&M bases and
electrical grid, marine environmental issues.

Module contents:
- Introduction to the ocean environment: ocean water and geology; ocean circulation and
stratification; ocean habitat; ocean economy.
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energy resource: parametrical characterisation of ocean waves, nearshore wave transformation,
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cost levels, water depth, seabed geology and ecology, distance to shore, ports, O&M bases and
electrical grid, marine environmental issues.

Reader’s advisory:
Boon, J.: Secrets of the tide: Tide and tidal current analysis and predictions, strom surges and sea
323 pp.
Roberts, J.: Marine Environment protection and biodiversity conservation. Springer-Verlag Berlin

Links:
- Language of instruction: English
- Duration (semesters): 1 Semester
- Module frequency: jährlich
- Module capacity: unlimited
- Modulart: je nach Studiengang Pflicht oder Wahlpflicht
- Lern-/Lehrform / Type of program: Lectures, Tutorial, Self-study

Vorkenntnisse / Previous knowledge:

Examination:
- Final exam of module: Exam: end of lecture period (early June)
- Report: deadline end of May
- Written exam (60%): 2.5 hours
- Written report (40%): essay on a chosen topic, 10-20 pages

Course type: Seminar

SWS:
- Frequency: 0 h