

<b>Module level</b> Master	<b>Creditpoints</b> 6	<b>Language</b> English	<b>Return</b> annual
<b>Module designation</b> <a href="#">Reliability, Availability, Maintenance Strategies</a>			
<b>Course(s)</b> <a href="#">Reliability, Availability, Maintenance Strategies</a>			
<b>Person responsible for the module</b>	Prof. Dr. rer. nat. Clemens Hoffmann		
<b>Lecturer</b>	Stefan Faulstich, Berthold Hahn		
<b>Workload</b>	180 h (30 h contact time and 150 h private study)		
<b>Language</b>	English		
<b>Relation to curriculum</b>	Specialist studies, Electrical Systems Technology, elective		
<b>Type of teaching, contact hours</b>	Online presentation, digital communication		
<b>Requirements according to examination regulations</b>	None		
<b>Recommended prerequisites</b> Module Mathematics			
<b>Module objective / intended learning outcomes</b> Students know different approaches regarding collection and analysis of reliability data in order to use the information for maintenance optimization. They know regulatory requirements, industry standards and optimization strategies. They are able to apply these strategies to the operation and maintenance of wind farms and to make use of experience gained during wind turbine operation as well as additional information coming from different monitoring systems.			
<b>Module content</b> <ul style="list-style-type: none"> <li>• Maintenance of wind turbines <ul style="list-style-type: none"> <li>– regulatory requirements</li> <li>– activities</li> <li>– strategies</li> </ul> </li> <li>• Wind turbine reliability <ul style="list-style-type: none"> <li>– definitions</li> <li>– failure statistics</li> <li>– Influence on availability and cost of energy</li> </ul> </li> <li>• Reliability Based Maintenance <ul style="list-style-type: none"> <li>– Acquisition of maintenance information</li> <li>– statistical analysis of failure behavior</li> <li>– qualitative analyzing techniques (e.g. FMEA)</li> </ul> </li> <li>• Condition based maintenance <ul style="list-style-type: none"> <li>– Condition Monitoring Systems</li> <li>– Structural Health Monitoring</li> <li>– appropriate sensors</li> </ul> </li> </ul>			
<b>Study and examination requirements and forms of examination</b>	Written exam (120min)		
<b>Media employed</b>	online script		

**Reading list**

- Tavner, Peter: Offshore Wind Turbines – Reliability, availability and maintenance, ISBN 978-1-84919-229-3
- Walford C.A.: Wind Turbine Reliability: Understanding and Minimizing Wind Turbine Operation and Maintenance Costs, SANDIA REPORT, SAND2006-1100
- Wiggelinkhuizen, E., et al: Assessment of condition monitoring techniques for offshore wind farms, Journal of Solar Energy Engineering