

## Fluid Mechanics (English)

<b>Module Title</b>		<b>Fluid Mechanics (English)</b>				
<b>Module Title in English</b>		<b>Fluid Mechanics</b>				
<b>Module Leader</b>		<b>Prof. Dr. Dinan Wang</b>				
<b>Teaching Staff</b>		<b>Prof. Dr. Dinan Wang</b>				
<b>Courselanguage/</b>		<b>English</b>				
<b>Code</b>	<b>Workload</b>	<b>Credits</b>	<b>Semester</b>	<b>Semester Offered</b>	<b>Duration</b>	
STL	180 h	6	3rd semester	Every Winter semester	1 semester	
1	<b>Type of Course</b>		<b>Scheduled Learning</b>	<b>Independent Study</b>	<b>Approx. Number of Participants</b>	
	Lecture:	3 h/week	5 h/week (= 75 h)	Total: 105 h	Lecture	max. 150 bzw. 120
	Exercise:	1 h/week			Exercise	max. 30
	Practical Course:	1 h/week			Practical Course	max. 15
2	<b>Learning Outcomes / Competences</b>					
	<p>The students should be able to identify and solve the simple technical fluid flow problems; (A2 K1 E3 R2)</p> <p>They should be able to describe the internal flow behaviour and calculate the related pipe flow problems, such as the pressure loss. (A3 K2 E3 R2)</p> <p>The should be able to estimate the forces exerted by the external flow on the immersed bodies. (A3 K3 E3 R3)</p> <p>The students should know the validity of the equations and recognize the limit of their applications. (A3 K2 E4 R4)</p> <p>The students should be able to apply their knowledge from the lecture to understand the working principles of the fluid machines as well as to describe and evaluate the different kinds of machines. (A2 K2 E5 R4)</p>					
3	<b>Contents</b>					
	<p>The physical characters of fluid, the fluid statics and buoyancy, the fluid kinematics, the conservation laws (mass, momentum, and mechanical energy): derivation and application, the characters and difference of laminar and turbulent flows, internal pipe flows , external flow over immersed bodies.</p> <p>Construction, working principle and design of the different fluid machines.</p>					
4	<b>Teaching Methods</b>					
	Lecture, Exercises (one group in German + one group in English) and Lab work.					
5	<b>Content-Related Module Prerequisites</b>					
	Math and natural science modules (e.g. Math 1 +2, fundamental Mechanics)					
6	<b>Formal Module Prerequisites</b>					
	NA.					

7	<b>Type of Exams</b> Written exam (100%, 90 minutes) Successful completion of the practical reports (pass / fail)																
8	<b>Prerequisite for the Granting of Credits</b> Pass of the required exams.																
9	<b>This Module Appears in:</b>  <table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">Course of Studies</th> <th style="text-align: left;">Status</th> </tr> </thead> <tbody> <tr> <td>Energie- und Umwelttechnik_BPO 2015</td> <td>Compulsory Module</td> </tr> <tr> <td>Energie- und Umwelttechnik_BPO 2020_BPO 2021</td> <td>Compulsory Module</td> </tr> <tr> <td>Energieinformatik_BPO2013_BPO2015</td> <td>Elective Module</td> </tr> <tr> <td>Energieinformatik_BPO2017</td> <td>Elective Module</td> </tr> <tr> <td>Modules in English at HRW</td> <td>Compulsory Module</td> </tr> <tr> <td>Wirtschaftsingenieurwesen-Energiesysteme_BPO 2013</td> <td>Compulsory Module</td> </tr> <tr> <td>Wirtschaftsingenieurwesen-Energiesysteme_BPO 2017</td> <td>Compulsory Module</td> </tr> </tbody> </table>	Course of Studies	Status	Energie- und Umwelttechnik_BPO 2015	Compulsory Module	Energie- und Umwelttechnik_BPO 2020_BPO 2021	Compulsory Module	Energieinformatik_BPO2013_BPO2015	Elective Module	Energieinformatik_BPO2017	Elective Module	Modules in English at HRW	Compulsory Module	Wirtschaftsingenieurwesen-Energiesysteme_BPO 2013	Compulsory Module	Wirtschaftsingenieurwesen-Energiesysteme_BPO 2017	Compulsory Module
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10	<b>Weighting of Grade in Relationship to Final Grade</b> Weighting equals the proportion of module credits in relationship to the total number of grade-relevant credits																
11	<b>Additional Information / Literature</b> <b>Literatur:</b> <ul style="list-style-type: none"> <li>• <b>Introduction to fluid mechanics</b>Autor: Young, Donald F. Ort, Verlag: Hoboken, NJ, WileyUmfang: XIX, 474, 9 S.: Ill., graph. Darst.Signatur: 10/WDA49(5)ISBN: 978-0-470-90215-8</li> <li>• <b>Fluid mechanicsfundamentals and applications</b>Autor: Çengel, Yunus A., Cimbala, John M. Ort, Verlag: s.l., McGraw-Hill Higher Education</li> <li>• <b>Kuhlmann, H.; Strömungsmechanik</b>; Pearson Studium; München; 2007.</li> <li>• <b>Böswirth, L.; Technische Strömungslehre - Ein Lehr- und Arbeitsbuch</b>; Vieweg Verlag; Wiesbaden; 2007.</li> </ul>																