<table>
<tr><td>Module Number:
M 245</td><td colspan="3">Module Title:
Physical Processes in Surface Waters</td><td>Type of Module:
M.Sc. Elective</td></tr>
<tr><td>Credits (ECTS)</td><td colspan="4">6</td></tr>
<tr><td>Workload
- Contact Time
- Private Study</td><td>Workload:
180 h</td><td colspan="2">Contact Time:
60 h / 4 SWS</td><td>Private Studies:
120 h</td></tr>
<tr><td>Duration
Module Coordinator</td><td colspan="2">1 Semester</td><td colspan="2">Calamita, Zarfl</td></tr>
<tr><td>Regular Cycle</td><td colspan="4">every summer semester</td></tr>
<tr><td>Language</td><td colspan="4">English</td></tr>
<tr><td>Learning- / Teaching Forms</td><td colspan="4">Lecture and exercises</td></tr>
<tr><td>Module Content</td><td colspan="4">This course explores the fundamental physical processes that govern the behaviour of surface waters, including lakes, rivers, and reservoirs. Topics covered include fluid dynamics, thermal stratification, mixing processes, wave dynamics, and sediment transport. The course emphasizes the interaction between physical forces and water chemistry, biological systems, and environmental factors. Students will gain a comprehensive understanding of how physical processes influence water quality, ecosystem dynamics, and hydrological cycles, with practical applications in environmental management, water resource planning, and climate studies.</td></tr>
<tr><td>Qualification Goals</td><td colspan="4">Develop a comprehensive understanding of the physical principles governing surface water flow, including hydrodynamics, wave mechanics and stratification.
Explain the interaction between flow processes and natural landscapes, including rivers, lakes and reservoirs, estuaries.
Analyze and quantify physical processes such as sediment transport, erosion, deposition, and pollutant dispersion in surface water systems.
Evaluate the impact of natural and anthropogenic influences, such as climate change, urbanization, and dam construction, on surface water dynamics.
Validate and interpret model results to support decision-making in water resource management.</td></tr>
<tr><td rowspan="3">Requirements for Obtaining Credit, Grading, Weight if appl.</td><td>Courses</td><td>Type of Lecture</td><td>Status</td><td>CH</td><td>CP</td><td>Type of Exam / Study Requirements</td><td>Duration of Exam</td><td>Grading System</td><td>Weighting</td></tr>
<tr><td>Lecture</td><td>L</td><td>c</td><td>2</td><td rowspan="2">6</td><td rowspan="2">A</td><td></td><td rowspan="2">g</td><td rowspan="2">100%</td></tr>
<tr><td>Seminar</td><td>S</td><td>c</td><td>2</td><td></td></tr>
<tr><td>Applicability</td><td colspan="4">M.Sc. Geowissenschaften/Geosciences, M.Sc. Geoökologie/Geoecology, M.Sc. Applied & Environmental Geoscience</td></tr>
<tr><td>Prerequisites</td><td colspan="4">A firm background in mathematics, physics and chemistry is expected.</td></tr>
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