

# Master in Life Sciences

A cooperation between  
BFH, FHNW, HES-SO, ZHAW

<b>Module title</b>	<b>Water Management for Households, Industry and Agriculture</b>
<b>Code</b>	E6
<b>Degree Programme</b>	Master of Science in Life Sciences
<b>Group</b>	Environment
<b>Workload</b>	3 ECTS (90 student working hours: 42 lessons contact = 32 h; 58 h self-study)
<b>Module Coordinator</b>	<p><b>Name:</b> Christoph Hugi  <b>Phone:</b> +41 61 228 55 84  <b>Email:</b> <a href="mailto:christoph.hugi@fhnw.ch">christoph.hugi@fhnw.ch</a>  <b>Address:</b> FHNW Campus MuttENZ, Hofackerstrasse 30, CH-4132 MuttENZ</p>
<b>Lecturers</b>	<ul style="list-style-type: none"> <li>• Christoph Studer, BFH-HAFL</li> <li>• Dirk Hengevoss, FHNW-HLS</li> <li>• Christoph Hugi, FHNW-HLS</li> <li>• Maryna Peter, FHNW-HLS</li> </ul>
<b>Entry requirements</b>	<p>Basic knowledge of environmental technologies and management.  Basic knowledge about water resources and environmental quality aspects (Blanc 2014).  Documents covering these aspects will be made available on Moodle.</p>
<b>Learning outcomes and competences</b>	<p>After completing the module, students will be able to:</p> <ul style="list-style-type: none"> <li>• explain the relationships between water quality aspects and human health as well as environmental quality.</li> <li>• apply basic methods to describe and assess water resources and their utilization for main sectors (household/industry/agriculture) and environmental needs.</li> <li>• apply methods in the different phases of managing the water cycle to enable efficient and effective utilization and conservation of water resources.</li> </ul>
<b>Module contents</b>	<ul style="list-style-type: none"> <li>• Characteristics of water resources: precipitation, surface water, and groundwater</li> <li>• Status and exploitation of water resources (quantitative and qualitative aspects)</li> <li>• Water abstraction, treatment, and distribution systems for the different sectors (household/industry/agriculture)</li> <li>• Water use/reuse/discharge and challenges in different sectors (household/industry/agriculture)</li> <li>• Water demand and supply management</li> <li>• Water distribution and water loss reduction</li> <li>• Monitoring and pricing of water use</li> <li>• Water resources protection</li> <li>• Water quality health and environmental impacts</li> <li>• Total water cycle management / integrated water resources management</li> <li>• Student seminar</li> </ul>
<b>Teaching / learning methods</b>	The module will be a mix of project-/problem-based lectures, tutorials and group work leading to a seminar presentation, and several practical exercises on the water topics covered in the course (quantity and quality).
<b>Assessment of learning outcome</b>	<ol style="list-style-type: none"> <li>1. Group writing assignment and seminar presentation during the course (40%)</li> <li>2. Individual assignments during the course (60%)</li> </ol>

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<b>Format</b>	7-weeks
<b>Timing of the module</b>	Spring semester, CW 15-22
<b>Venue</b>	Mix of online and on-site lectures (in Olten)
<b>Bibliography</b>	<ul style="list-style-type: none"><li>• BAFU about water resources management: <a href="#">Water resource management (admin.ch)</a> and <a href="#">High-level instruments (admin.ch)</a></li><li>• Blanc P (2014) Water in Switzerland – an overview. Swiss Academies of Arts and Sciences</li><li>• Holden JA (2013) Water Resources: An Integrated Approach. Taylor &amp; Francis. ISBN-139780415602822</li><li>• <a href="#">The United Nations world water development report 2020: water and climate change - UNESCO Digital Library</a></li><li>• Federal Office of Public Health and Federal Office for the Environment: <a href="#">Reporting for Switzerland under the Protocol on Water and Health</a></li><li>• UNECE: <a href="#">The Protocol on Water and Health</a></li></ul>
<b>Language</b>	English
<b>Links to other modules</b>	Links with E3 “Sustainable Natural Resource Management”, GIS modules at HES-SO and BFH.
<b>Comments</b>	
<b>Last Update</b>	16.08.2024