

# Master in Life Sciences

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

<b>Module title</b>	<b>Life Cycle Assessment</b>
<b>Code</b>	E2
<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> Dr. Matthias Meier  <b>Phone:</b> +41 (0)31 910 22 88  <b>Email:</b> <a href="mailto:matthiassamuel.meier@bfh.ch">matthiassamuel.meier@bfh.ch</a>  <b>Address:</b> Berner Fachhochschule, HAFL, Länggasse 85, 3052 Zollikofen</p>
<b>Lecturers</b>	<ul style="list-style-type: none"> <li>• Dr. Thomas Kägi (Carbotech)</li> <li>• Mischa Zschokke (Carbotech)</li> <li>• Dr. Jan Grenz (BFH-HAFL)</li> </ul>
<b>Entry requirements</b>	<p>To be able to successfully participate in this module, students should have:</p> <ul style="list-style-type: none"> <li>• profound knowledge of subject matter in their field of expertise;</li> <li>• basic knowledge of environmental challenges such as climate change, water pollution, ecosystem eutrophication, soil acidification, etc.;</li> <li>• experience in working with databases and analytical software (needed to be able to work with LCA software during the module).</li> <li>• A self-test for assessing personal competences in relation to the module contents is available on the Moodle platform.</li> </ul>
<b>Learning outcomes and competences</b>	<p>After completing the module, students will be able to:</p> <ul style="list-style-type: none"> <li>• understand the principles of life cycle assessment (LCA) and appraise the potential and limitations of the method for their personal field of expertise/work</li> <li>• correctly plan and do an LCA using common LCA software tools</li> <li>• critically review and interpret LCA studies and results.</li> </ul>
<b>Module contents</b>	<p>Quantitative information on the environmental impacts of production is ever more important in the optimization of production processes and value chains. LCA is the most widely used method for quantifying global warming potential, energy use, eutrophication potential and other environmental impacts of products and services, from cradle to grave.</p> <ul style="list-style-type: none"> <li>• What is LCA? How and for what reasons was it developed? Seminal examples of LCA.</li> <li>• What can an LCA do for you? Use and misuse of LCA.</li> <li>• Overview of environmental management methods (e.g. Eco-Management and Audit Scheme, Environmental Impact Assessment, Ecological footprint) and impact indicators (e.g. eco-indicator 99, Umweltbelastungspunkte, Global Warming Potential 100, ReCiPe)</li> <li>• Steps of the LCA procedure: scoping (defining goals, system boundaries, functional units), life cycle inventory (data collection vs. estimation), software tools to perform the analysis, life cycle impact assessment (interpretation of environmental impact), critical evaluation of reliability and limitations of the analysis</li> <li>• Case study (group work): students do an LCA of a product from their field of specialization</li> </ul>

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<b>Teaching / learning methods</b>	<ul style="list-style-type: none"><li>• Interactive lectures</li><li>• Discussions</li><li>• Group work (practical case study)</li><li>• Presentations (practical case study)</li></ul>
<b>Assessment of learning outcome</b>	<ol style="list-style-type: none"><li>1. Written group report on the LCA case study (50%)</li><li>2. Oral group presentation of the LCA case study (50%)</li></ol>
<b>Format</b>	7-weeks
<b>Timing of the module</b>	Autumn semester, CW 45-51
<b>Venue</b>	Bern
<b>Bibliography</b>	ISO norms 14040 and 14044 Klöpper W, Grahl B, 2014. Life Cycle Assessment (LCA): A Guide to Best Practice. Wiley-VCH Publishers. (Note: If you can read German, you should rather read the German version of this textbook.) Selected, regularly updated, articles that highlight potential and limitations of LCA e.g. in the food and chemical industries. A comprehensive script is available for download from moodle.
<b>Language</b>	English
<b>Links to other modules</b>	There is a link to several specialisation modules dealing with sustainability (e.g. "Holistic assessment of production systems" of BFH or "Material recovery, industrial pollution control and resource recovery" of FHNW).
<b>Comments</b>	Students will DO an LCA. It is important that they can choose the product (or process) to analyse; this allows them to draw on their diverse backgrounds.
<b>Last Update</b>	29.03.2019