

Module Title	Impact Assessment
Code	MCCf443
Degree Programme	Master of Science – Circular Innovation and Sustainability
ECTS Credits	3
Workload	90 hours
Module Coordinator	<p>Name: Dr. Matthias Meier Phone: +41 (0) 31 910 22 88 Email: matthiassamuel.meier@bfh.ch Address: BFH – HAFL, Food Science & Management Länggasse 85, 3052 Zollikofen</p>
Lecturers	<ul style="list-style-type: none"> • Ariane Reist; HAFL
Entry Requirements	<p>Prerequisite:</p> <ul style="list-style-type: none"> • MCCf123: Biological Cycles: Natural Resources and Ecosystem Services <p>Recommended:</p> <ul style="list-style-type: none"> • MCCf113: Technological Cycles: Materials and Processes • MCCf133: Pathways to Net Zero GHG Emissions in the Energy and Chemical Sectors <p>Optional:</p> <ul style="list-style-type: none"> • MCCf313: Society and Technology <p>Further requirements:</p> <ul style="list-style-type: none"> • Understanding cause-effect relationships between emissions/pollutants and environmental impacts. • Basic knowledge of environmental challenges such as climate change, water pollution, ecosystem eutrophication, soil acidification, impacts on biodiversity and soil quality, etc. • Basic understanding of environmental modelling. • Basic understanding of impact assessment using the Life Cycle Approach. • Understanding of the concept of sustainable development, Agenda 2030 with the Sustainable Development Goals (SDGs).
Competencies upon Completion	<p>After completing the module, students will be able to:</p> <ul style="list-style-type: none"> • understand the principles of Life Cycle Assessment (LCA) and appraise the potential and limitations of the method for different applications; • correctly plan and carry out an LCA using software tools and inventory databases; • report an LCA in a scientifically sound and comprehensible manner; • understand how, from a product-based perspective, environmental impacts need to be interpreted and how LCA results contribute to the overall sustainability discussion; • demonstrate better social, self-management and group work skills.

Content	<p>In module MCCf443 you will acquire methodological competencies for Life Cycle Assessment (LCA), which is one of the most widely used methods of environmental sustainability assessment.</p> <p>Starting from the ecological sustainability dimension you will learn how to quantitatively assess the environmental impacts of products and services along their life cycle using environmental life cycle assessment (E-LCA). You will conduct an LCA on a case study using common LCA software and inventory databases and acquire a profound understanding of how to interpret the results. You will gain insight into different applications of life cycle assessment from industrial to agricultural products. Further you will gain an overview of additional applications of life cycle thinking e.g., for social (social life cycle assessment / S-LCA), economic aspects (life cycle costing / LCC) or the newest developments in LCA applications linking LCA impact categories to sustainable development goals (SDG-LCA) and referencing LCA results with planetary boundaries.</p>
Teaching and Learning Methods	<p>Most of the theoretical background you will elaborate yourself through self-study assignments on Moodle. The application of the method will then be trained and coached in groups during the lectures.</p> <ul style="list-style-type: none"> • Self-study • Lectures • Coached group work
Competency Assessment	<ul style="list-style-type: none"> • Written exam - Moodle test (60%) • Group report on LCA research case (40%)
Mode of Repetition	<p>Should a student fail the module, they have one more attempt.</p> <p>They may either:</p> <ul style="list-style-type: none"> • Submit a new assignment (individual report, 100%), defined by the <i>Module Coordinator</i>, for the next resit examination session. • Repeat the entire module next time it is offered.
Format	2 lessons per week over 7 weeks with inputs and coaching sessions; in addition, software teaching in the afternoon of Calendar Week 18
Attendance	Not mandatory, except software teaching & written examination in Calendar Week 18
Module Type	Compulsory
Timing of the Module	<p>Spring Semester, Calendar Weeks 17 to 23</p> <ul style="list-style-type: none"> • Preparation work starts in Calendar Week 13. • Written examination in Calendar Week 18 (45 minutes).
Venue	<p>Onsite Brückenstrasse 73, 3005 Bern</p> <ul style="list-style-type: none"> • Coaching onsite and online
Literature	<p>Some of the literature can be found on the Moodle page of the course.</p> <ul style="list-style-type: none"> • Curran, M (Ed.). 2017. Goal and Scope Definition in Life Cycle Assessment. Dordrecht: Springer. pp 170. https://link.springer.com/book/10.1007/978-94-024-0855-3 • Hauschild, M.Z., Rosenbaum, R.K., Olsen, S.I. (Eds.). 2018. Life Cycle Assessment. Theory and Practice. Cham: Springer. pp. 1216. https://link.springer.com/book/10.1007/978-3-319-56475-3 • Klöpffer, W. Grahl, B. 2014. Life Cycle Assessment (LCA): A Guide to Best Practice. Wiley-VCH Publishers. pp 440. https://www.wiley.com/en-us/Life+Cycle+Assessment+%28LCA%29%3A+A+Guide+to+Best+Practice-p-9783527655649 • Life Cycle Initiative and Social Life Cycle Alliance. 2022. Pilot Projects on Guidelines for Social Life Cycle Assessment of Products and Organizations. https://www.lifecycleinitiative.org/library/pilot-projects-on-guidelines-for-social-life-cycle-assessment-of-products-and-organizations-2022/

	<ul style="list-style-type: none"> • Ryberg, M W. Owsianiak, M. Richardson, K. Hauschild, M Z (2018): Development of a life-cycle impact assessment methodology linked to the Planetary Boundaries framework. In Ecological Indicators 88, pp. 250-262. https://doi.org/10.1016/j.ecolind.2017.12.065 • United Nations Environment Programme (UNEP). 2009. Guidelines for Social Life Cycle Assessment of Products. https://www.unep.org/resources/report/guidelines-social-life-cycle-assessment-products • United Nations Environment Programme (UNEP). 2021. Methodological Sheets for Subcategories in Social Life Cycle Assessment (S-LCA) https://www.lifecycleinitiative.org/library/methodological-sheets-for-subcategories-in-social-life-cycle-assessment-s-lca-2021/ • Weidema, B. Goedekoop, M. Meijer, E. Harmens, R. 2020. LCA-based assessment of the Sustainable Development Goals. 2.-0 LCA consultants and PRé Sustainability. https://lca-net.com/publications/show/lca-based-assessment-of-the-sustainable-development-goals/ • Willett, W. Rockström, J. Loken, B. Springmann, M. Lang, T. Vermeulen, S. et al. (2019). Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems. In The Lancet 393 (10170), pp. 447-492. https://doi.org/10.1016/S0140-6736(18)31788-4
Language	English
Links to Other Modules	<ul style="list-style-type: none"> • MCCf453 Circular Design
Last Update	April 2025