Module Title	Impact assessment
Code	MCCf443
Degree Programme	Master of Science – Circular Innovation and Sustainability
ECTS Credits	3
Workload	90 hours
Module Coordinator	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
Lecturers	• Dr. Evelyn Marconi; HAFL • Ariane Reist; HAFL • Rolf Arnold; HAFL
Entry Requirements	Prerequisite: • MCCf113: Technological cycles: materials and processes • MCCf123: Biological cycles: natural resources and ecosystem services Recommended: • MCCf133: Pathways to net zero GHG emissions in the energy and chemical sectors Optional: • MCCf313: Society and Technology Further requirements: • 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).
Learning Outcomes and Competences	After completing the module, students will be able to: • 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 databases; • report an LCA in a scientifically sound and comprehensible manner; • understand how environmental and social impacts in the product-based perspective need to be interpreted and how LCA results contribute to the overall sustainability discussion; • improve their social, self-management and group work skills.

Module Content	In module MCCf443 you will acquire methodological competences on life cycle assessment (LCA), which is one of the most widely used methods for environmental and social sustainability assessment. Starting from the ecological and social sustainability dimension you will learn how to quantitatively assess the environmental and social impacts of products and services along their life cycle using environmental (E-LCA) and social life cycle assessment (S-LCA). You will conduct an LCA on a case study using common LCA software and inventory databases and acquire a profound understanding on 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 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.
Teaching / Learning Methods	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. • self-study • lectures • coached group work
Assessment of Learning Outcome	• Group report on LCA research case – individually graded (70%) • Oral presentation on group report – individually graded (30%)
Conditions of assessment repetition	In case of failure, students can either: • Realise a new assignment (individual short LCA study report) for the next re-examination period. • Retake the full module next time it is offered. **NB: in MSc CIS, failed modules can only be repeated once!**
Format	• Third quarter: Self-study (preparatory work) • Fourth quarter: Weekly lectures or coaching
Attendance & Compulsory session	Not compulsory
Timing of the module	Spring Semester
Venue	• Lectures on-site • Coaching online
Location	Bern
Bibliography	Some of the literature can be found on the Moodle page of the course. • 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 • 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 Initative 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/ • 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	• MCCf453 Circular design
Last Update	May 2023