Module Title	Biological Cycles: Natural Resources and Ecosystem Services
Code	MCCf123
Degree Programme	Master of Science – Circular Innovation and Sustainability
ECTS Credits	3
Workload	90 hours • 14 hours contact teaching and excursions • 76 hours self-study and guided exercises
Module Coordinator	Name: Dr. Mélanie Feurer Phone: +41 (0) 31 910 29 33 Email: melanie.feurer@bfh.ch Address: BFH – HAFL, Länggasse 85, 3052 Zollikofen
Lecturers	• Dr. Gaspard Dumollard; HAFL • Célia Bühler; HAFL • Dr. Christian Thalmann; HAFL • Jean-Baptiste Luce HAFL
Entry Requirements	Prerequisite: • MCCf036 Bridging Life Sciences
Competencies upon Completion	**Competencies** After completing the module, students will be able to: • assess potential impacts of management choices for the sustainable use of natural resources in agricultural, forestry and aquaculture production systems; • communicate and cooperate with specialists in the field of resource management, to ensure the sustainability of resource use in circularity projects and processes. **Outcomes** After completing the module, students will be able to: • assess potential impacts of management choices for the sustainable use of natural resources in production systems, using case studies from agriculture, forestry, agroforestry and aquaculture; • define production systems and boundaries with inputs and outputs and explain the ecosystem services concept; • analyse how different management choices in production systems affect the provision of ecosystem services and environmental impacts.

Content	This course centres on the functioning and cycles of ecosystems with a focus on production systems, the potential and limitations of natural resource use, and the implications of management choices on the environment and the ecosystem services they provide. Using comparative case studies and following a step-by-step approach, students discover the natural resource base (forests, agricultural land, aquaculture) and the natural cycles taking place. Using the concept of ecosystem services and environmental impacts, they investigate the way in which management choices influence these cycles and the resource base.
Teaching and Learning Methods	• Case studies • Group exercises • Excursions • Learning videos
Competency Assessment	• Written exam (50%) • Oral presentation (50%) •
Mode of Repetition	Should a student fail the module, they have one more attempt. They may either: • Do an oral exam (100%), defined by the *Module Coordinator*, for the next resit examination session, or • Repeat the entire module next time it is offered.
Format	2 lessons per week over 7 weeks and 2 excursions
Attendance	Mandatory on date of oral presentation (part of assessment)
Module Type	Compulsory
Timing of the Module	Autumn Semester, Calendar Weeks 47 to 51 and 02 to 03
Venue	Onsite | Brückenstrasse 73, 3005 Bern Onsite | Länggasse 85, 3052 Zollikofen (excursions)
Literature	• Millennium Ecosystem Assessment, 2005. *Ecosystems and Human Well-being: Synthesis*. Island Press, Washington, DC., http://millenniumassessment.org/en/Synthesis.html • The Economics of Ecosystems and Biodiversity (TEEB) (2018). *Measuring what matters in agriculture and food systems: a synthesis of the results and recommendations of TEEB for Agriculture and Food's Scientific and Economic Foundations report*. Geneva: UN Environment. • Nair P. K. R. et *al.*, *An Introduction to Agroforestry*, https://doi.org/10.1007/978-3-030-75358-0_2 • Ashton, Mark S. / Kelty, Matthew J., 2018. The Practice of Silviculture, Applied Forest Ecology, ISBN: 978-1-119-27095-9
Language	English
Links to Other Modules	• MCCf113 Technological Cycles: Materials and Processes • MCCf133 Pathways to Net Zero GHG Emissions in the Food Sector • MCCf173 Circular Use of Materials • MCCf323 Society and Environment
Last Update	July 2026