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: Evelyn Coleman Brantschen Phone: +41 (0) 31 848 51 03 Email: evelyn.coleman@bfh.ch Address: BFH – HAFL, Office G91, Länggasse 85, 3052 Zollikofen
Lecturers	• Prof. Dr. Jan Grenz; HAFL • Dr. Mélanie Feurer, HAFL • Célia Bühler; HAFL • Corinna Hemkes; HAFL • Dr. Silvia Zingg; HAFL • Dr. Gaspard Dumollard; HAFL
Entry Requirements	Prerequisite: • MCCf036 Bridging life sciences
Learning Outcomes and Competences	**Competences** After completing the module, students will be able to: • assess potential impacts of management choices for the sustainable use of natural resources; • communicate and cooperate with specialists in the field of resource management, to ensure the sustainability of resource use in circularity projects and processes. **Outcome** After completing the module, students will be able to: • analyse the potential benefits and risks of natural resource management choices on ecosystem quality and resilience; • analyse the effects of resource management choices on sustainable ecosystem functioning by applying the concept of ecosystem services, using case studies from agriculture and forestry.
Module Content	The functioning of ecosystems, the cycles taking place, the potentials and limitations of natural resource use, and the implications of management choices on natural resources and the ecosystem services provided are at the centre of this course. Using case studies and following a step-by-step approach, students discover the natural resource base (forests, agricultural land) and the natural cycles taking place. Using the concept of ecosystem services, they investigate the way in which management choices influence these cycles and the resource base.

Teaching / Learning Methods	• Case studies • Group exercises • Excursions • Learning videos
Assessment of Learning Outcome	• Group work report (40%) • Oral presentation (30%) • Personal reflection on learnings (30%) In case of an overall insufficient grade (<4), students have the possibility to do a specific improvement on 1-2 chapters of the written report as defined by the module coordinator if overall and individual grades are minimum 3.5 (≥3.5). The maximum grade that can be achieved for the resubmitted report is 4.
Conditions of assessment repetition	In case of failure, students can either: • Provide a written report covering a number of elements on a different case study than worked on within the course (elements defined by module coordinator) and present orally. • Retake the full module next time it is offered. **NB: in MSc CIS, failed modules can only be repeated once!**
Format	2 lessons per week over 7 weeks, of which first two weeks are excursions
Attendance & Compulsory session	Compulsory on date of oral presentation (part of assessment)
Timing of the module	Autumn Semester
Venue	On-site
Location	Bern & Zollikofen (excursions)
Bibliography	• 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 • Hochschule für Agrar-, Forst- und Lebensmittelwissenschaften (BFH-HAFL): *tutorials Meinwald* https://meinwald.ch/#/tutorial
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	May 2023