



Module Title	
Systems Analysis and Consulting for Sustainability	
Code	MCCf473
Degree Programme	Master of Science – Circular Innovation and Sustainability
ECTS Credits	3
Workload	90 hours
Module Coordinator	Name: Prof. Dr. Stefan Grösser Phone: +41 32 321 62 75 E-mail: stefan.groesser@bfh.ch Address: BFH-TI, Quellgasse 12, 2502 Biel
Lecturers	<ul style="list-style-type: none"> Dr. Andreas Gerber; HAFL
Entry Requirements	None
Competencies upon Completion	<p>After completing the module, students will be able to:</p> <ul style="list-style-type: none"> design and manage consulting processes for complex sustainability problems, including stakeholder identification, perspective integration, and process structuring; apply systems thinking to define, bound, and analyse real-world sustainability problems, selecting and justifying appropriate system approaches and methods; develop and use qualitative System Dynamics models, including reference modes, feedback structures, and dynamic hypotheses, to explain system behaviour; analyse and compare policy or intervention options using model-based scenarios, simulation, and leverage-point reasoning; formulate, interpret, and communicate model-based insights and evidence-based recommendations effectively to support sustainability decision-making and change.
Content	<p>This module equips students with the ability to identify and analyse complex sustainability challenges using a systems modelling and consulting perspective. It demonstrates how systems thinking and System Dynamics modelling can be embedded in a structured consulting process to support sustainability-related decision-making.</p> <p>The module begins with an introduction to systems thinking and consulting. Core concepts such as system boundaries, feedback loops, accumulation, delays, nonlinearity, and uncertainty are introduced using real-world examples. Students learn how to assess whether a problem is suitable for a systems-based approach and how to frame sustainability challenges from a consulting perspective.</p> <p>Students are then guided through the System Dynamics modelling process as a central consulting tool. This includes problem definition, formulation of reference modes describing system behaviour over time, and the development of dynamic hypotheses based on feedback structures. Qualitative modelling with causal loop diagrams is used to identify key feedback mechanisms, system archetypes, and drivers of sustainability problems.</p>

	<p>The module subsequently provides hints about quantitative stock-and-flow modelling. Students build simple simulation models, explore accumulations, flows, delays, and nonlinear relationships. The focus is on using models as transparent decision-support tools.</p> <p>In the final part, students conduct scenario experiments, identify leverage points, assess trade-offs and unintended consequences, and learn how to communicate model insights effectively to decision-makers and support the implementation of system-based interventions.</p> <p>This module employs an application-driven pedagogy designed to deepen the students' understanding of consulting processes and systems analysis. The above-mentioned concepts are implemented and applied in individual student projects. The result - a haptic system representation - will be presented as part of a competency assessment in the form of a video.</p>
Teaching and Learning Methods	<ul style="list-style-type: none"> • Flipped classroom • Project-based learning • Interactive simulations • On-site workshops
Competency Assessment	<ul style="list-style-type: none"> • Video report about individual project (50%) • Oral exam (50%) <p>Students who receive an insufficient overall grade of 3.5, are given the opportunity to carry out a <i>subsequent improvement</i> of the video report defined by the <i>Module Coordinator</i>. The maximum overall grade that can then be obtained is 4. This still counts as the first attempt.</p>
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"> • Retake an oral exam (100% - complete content of the module), for the next resit examination session, <u>provided the student has actively participated in the course</u>. • Repeat the entire module next time it is offered.
Format	<p>2 lessons per week over 7 weeks</p> <p>Possible additional coaching sessions, timing is variable.</p>
Attendance	<p>Not mandatory but strongly recommended.</p> <p>However, active participation throughout the module is mandatory. A lack of commitment and/or participation in course can lead to exclusion from the <i>Competency Assessment</i> and therefore to failure of the module.</p>
Module Type	Compulsory-Elective
Timing of the Module	Autumn Semester, Calendar Weeks 47 to 51 and 02 to 03
Venue	Onsite Brückenstrasse 73, 3005 Bern
Literature	<ul style="list-style-type: none"> • Optional: Schaffernicht, M.; Grösser, S. (2018). <i>Growth Dynamics in New Markets</i>. Wiley Publishing.
Language	English
Links to Other Modules	<ul style="list-style-type: none"> • MCCf013 Introduction to Circular Economy and Scientific Literature • MCCf223 Circular Supply Chain • MCCf413 Research Methods 1: Qualitative Approaches • MCCf433 Research Methods 3: Transdisciplinary Approaches • MCCf443 Impact Assessment
Last Update	February 2026