



Module	Optimisation of Production Systems in Agriculture – nutrient fluxes and their optimisation at different levels
Code	MSLS_AF-23
Degree Program	Master of Science in Life Sciences (MSLS)
ECTS Credits	5
Workload	150 h: Contact 55 h; Group Exercise 40 h; Self-study 55 h
Module Coordinator	<p>Name Andreas Keiser, Federico Ghione, Thomas Kupper, Beat Reidy</p> <p>Phone +41 31 848 51 93</p> <p>E-Mail federico.ghione@bfh.ch</p> <p>Address Bern University of Applied Sciences, School of Agricultural, Forest and Food Sciences, Laenggasse 85, 3052 Zollikofen</p>
Lecturers	<ul style="list-style-type: none"> • Andreas Keiser • Beat Reidy • Thomas Kupper • Federico Ghione • Guest lecturers
Entry Requirements	<i>None</i>
Learning Outcomes and Competences	<p>After completing the module, students will be able to</p> <ul style="list-style-type: none"> • understand the basics of optimization and its application to diverse agricultural production systems. • analyze and solve optimization problems in agricultural production, selecting and applying appropriate methods and tools. • modulate the complexity of agricultural production systems to control them effectively and react to changes (decision-making tools). • critically reflect on and discuss the results of optimization and propose suitable measures and control instruments.
Module Content	<p>This module examines nutrient flows and addresses the following topics using relevant agricultural examples:</p> <ul style="list-style-type: none"> • Description and analysis of selected production systems. • Overview of relevant optimization approaches, methods, and tools. • Introduction and discussion of specific optimization issues in animal and plant production systems. • Students will be assigned a case-study farm on which to optimize selected production-system processes with the use of appropriate tools and present the results orally.
Teaching / Learning Methods	Lecturers will provide introductions and overviews of approaches, methods, and tools accompanied by exercises and coaching in learning groups. The module includes seminars on concrete examples involving stakeholders. The main learning method is self-study in small student groups using case study examples. In a final seminar, student groups will present the results of their case studies.
Assessment of Learning Outcome	<ol style="list-style-type: none"> 1) written exam (50%) 2) oral seminar presentation of the nutrient flows of a selected farm and their optimization possibilities (50%)

Bibliography	Case study specific documentation and literature will be uploaded on Moodle beforehand.
Language	English
Comments	Introductory events, excursions and presentations are mandatory for all students. You will find detailed information on mandatory sequences on Moodle two weeks before the module starts.
Last Update	January 2026