Module	**Optimisation of Production Systems in Agriculture and Forestry**
Code	MSLS_AF-23
Degree Program	Master of Science in Life Sciences (MSLS)
ECTS Credits	5
Workload	150 h: Contact 55 h; Group Exercise 10 h; Self-study 85 h
Module Coordinator	**Name** Dr. Andreas Keiser **Phone** +41 31 910 21 50 **Email** andreas.keiser@bfh.ch **Address** Bern University of Applied Sciences, School of Agricultural, Forest and Food Sciences, Laenggasse 85, 3052 Zollikofen
Lecturers	• Dr. Bruno Durgiai • Dr. Andreas Keiser • Thomas Kupper • Dr. Christian Rosset • Guest lecturers
Entry Requirements	*None*
Learning Outcomes and Competences	After completing the module students will be able to: • comprehend the rationales of optimisation and simulation and their application to production systems in agriculture and forestry; • analyse and solve optimisation problems in agriculture and forestry production systems, choosing and using adequate methods and tools; • modulate the complexity of A&F production systems in order to steer them effectively and to react on changes (decision making tools); • critically reflect and discuss the results of the optimisation and suggest adequate measures and monitoring instruments.
Module Content	The module will deal with the following topics by drawing on examples from agriculture and forestry: • Description and analysis of selected production systems and their framework conditions. • Overview of possible optimisation approaches, methods and tools. • Introduction and discussion of three concrete optimisation problems in animal, crop and forest production systems (seminar). • Students select a topic in A&F, optimise selected parts of the corresponding production system with adequate tools and prepare an oral presentation.
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	1) Written report on the optimisation for the selected topic (67%) 2) Oral seminar presentation of the optimisation (33%)

Bibliography	Case study specific documentation will be uploaded on Moodle before the course. General documents for this module include: Jones JW, Hoogenboom G, Porter C, Boote KJ, Batchelor WD, Hunt LA, Wilkens PW, Singh U, Gijsman AJ, Ritchie JT, 2003. The DSSAT Cropping System Model. European Journal of Agronomy 18, 235-265. Keating BA, Carberry PS, Hammer GL, Probert ME, Robertson MJ, Holzworth D, Huth NI, Hargreaves JNG, Meinke H, Hochman Z, McLean G, Verburg K, 2003. An overview of APSIM, a model designed for farming systems simulation. European Journal of Agronomy, 18 (3), 267-288. Hediger W, 2006. Modeling GHG emissions and carbon sequestration in Swiss agriculture: An integrated economic approach. International Congress Series 1293, 86–95.
Language	English
Comments	The three case studies in the module and the final seminar with the presentations are compulsory for students. For details on compulsory sequences, please check the detailed schedule of the module, which will be uploaded 4 weeks before the start of the module on Moodle
Last Update	20.04.2022.2022 / Andreas Keiser