

Master in Life Sciences

A cooperation between
BFH, FHNW, HES-SO, ZHAW

Module title	Optimisation and Bio-Inspired Algorithms
Code	CO3
Degree Programme	Master of Science in Life Sciences
Group	Computation
Workload	3 ECTS (90 student working hours: 42 lessons contact = 32 h; 58 h self-study)
Module Coordinator	Name: Thomas Ott Phone: +41 (0)58 934 56 84 Email: thomas.ott@zhaw.ch Address: ZHAW Life Sciences und Facility Management, Schloss 1, 8820 Wädenswil
Lecturers	<ul style="list-style-type: none"> • Thomas Ott, ZHAW • Ahmad Aghaebrahimian, ZHAW
Entry requirements	Bachelor level of analysis, linear algebra, statistics; basic python programming skills There is an online tutorial available for students without python skills
Learning outcomes and competences	After completing the module, students will be able to: <ul style="list-style-type: none"> • understand and analyze different optimization problems • understand, explain and validate a variety of linear, nonlinear, deterministic and stochastic optimization methods (a special focus will be on nature-and bio-inspired methods such as simulated annealing, genetic algorithms or swarm intelligence) • apply the algorithms to problems in their field
Module contents	The major topics covered in the module are: <ul style="list-style-type: none"> • identification of problems solvable with optimization methods • abstraction and modelling of task description • coding of optimization tasks • bio-inspired algorithms • implementation of examples from various fields with python
Teaching / learning methods	lecture, exercises, seminar-style, project work, self-study, python programming
Assessment of learning outcome	1. individual project work including a short presentation (60%) 2. written exam (closed book) (40%)
Format	7-weeks
Timing of the module	Spring semester, CW 8-14
Venue	Blended learning format. Presence sequences take place in Olten
Bibliography	-
Language	English
Links to other modules	Coordinated with the module Machine Learning and Pattern Recognition
Comments	-
Last Update	07.08.2025