

# Master in Life Sciences

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

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