

# Master in Life Sciences

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

<b>Module title</b>	<b>Optimisation Methods</b>
<b>Code</b>	BECS4
<b>Degree Programme</b>	Master of Science in Life Sciences
<b>Group</b>	BECS (Biomedical Engineering and Computational Science)
<b>Workload</b>	3 ECTS (90 student working hours: 42 lessons contact = 32 h; 58 h self-study)
<b>Module Coordinator</b>	<p><b>Name:</b> Erik Schkommodau  <b>Phone:</b> +41 (0)61 228 54 19  <b>Email:</b> <a href="mailto:erik.schkommodau@fhnw.ch">erik.schkommodau@fhnw.ch</a>  <b>Address:</b> FHNW, HLS, Gründenstrasse 40, 4132 Muttenz</p>
<b>Lecturers</b>	<ul style="list-style-type: none"> <li>• Prof. Dr. Erik Schkommodau, FHNW</li> </ul>
<b>Entry requirements</b>	Bachelor level of analysis, linear algebra, statistics; <b>Matlab programming skills</b> There is an online tutorial available for students without Matlab skills
<b>Learning outcomes and competences</b>	<p>After completing the module, students will be able to:</p> <ul style="list-style-type: none"> <li>• able to explain and validate different optimization methods</li> <li>• apply them appropriately to problems in their field (e.g. medical measurement data).</li> </ul>
<b>Module contents</b>	<p>The major topics covered in the module are:</p> <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>• getting overview about linear, non-linear, deterministic and stochastic optimization methods including necessary mathematical methods</li> <li>• implementation of examples from various fields with Matlab</li> </ul>
<b>Teaching / learning methods</b>	lecture, exercises, seminar-style, project work, self-study, Matlab programming
<b>Assessment of learning outcome</b>	<ol style="list-style-type: none"> <li>1. final exam, closed book (50%)</li> <li>2. individual project work (50%)</li> </ol>
<b>Format</b>	7-weeks
<b>Timing of the module</b>	Spring semester, CW 8-14
<b>Venue</b>	Olten
<b>Bibliography</b>	<p>Additional course material:</p> <p>Practical Methods of Optimization Paperback, by R. Fletcher, 2009</p> <p>Applied Dynamic Programming (Princeton Legacy Library), by Richard E. Bellman (Author), Stuart E Dreyfus, 2015</p> <p>Numerical Recipes: The Art of Scientific Computing, by William H. Press, Saul A. Teukolsky, William T. Vetterling, Brian P. Flannery, 3rd Edition</p>
<b>Language</b>	English
<b>Links to other modules</b>	
<b>Comments</b>	
<b>Last Update</b>	25.09.2020