



Master in Life Sciences

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

Module	Introduction to Neural Networks
Code	V5_12
Degree Programme	Master of Science in Life Sciences (MSLS)
ECTS Credits	3 ECTS
Workload	40 h: ca. 20 h contact lessons; 8 h guided exercises; 12 h self-study
Module Coordinator	<p>Name Dr. Martin Schüle</p> <p>Phone +41 (0)58 934 57 84</p> <p>Email martin.schuele@zhaw.ch</p> <p>Address ZHAW Zürcher Hochschule für Angewandte Wissenschaften Life Sciences and Facility Management Campus Grüental Postfach CH-8820 Wädenswil</p>
Lecturers	Dr. Martin Schüle
Entry Requirements	<p>The course requires a solid background in mathematics, as usually taught at the Bachelor's level, especially in:</p> <ul style="list-style-type: none"> • statistics • probability theory • basic linear algebra <p>The module and associated practical exercises will be taught using Python and DL libraries. Familiarity with basic programming in Python is required.</p>
Learning Outcomes and Competences	The objective of the module is to provide the students with a working knowledge of current artificial neural network (ANN) and deep learning (DL).
Module Content	<p>The module covers the following topics:</p> <ul style="list-style-type: none"> • Biological basis of ANN • Basic mathematical concepts of ANN • Basics of ANN: Perceptron, Multilayer Perceptron, backpropagation • Basic NN architectures: FNN, CNN • Use cases in Life Sciences
Teaching / Learning Methods	<ul style="list-style-type: none"> • Lectures ~30% • Guided exercises ~20% • Self-study ~50%
Assessment of Learning Outcome	<ul style="list-style-type: none"> • Written exam (100%) pass/fail

Bibliography	Lecture notes will be provided. Important additional literature will be provided on Moodle.
Language	English
Comments	The module is coordinated with the module “Machine Learning and Pattern Recognition”, “Deep Learning”, and the module “Advanced Deep Learning”.
Last Update	27.02.2025