Module	**Analysis of Spatial Data - GIS**
Code	MSLS_AF-53
Degree Program	Master of Science in Life Sciences (MSLS)
ECTS Credits	5
Workload	150 h: Lectures 38 h; Group Exercise 32 h; Workshop 4 h; Self-study 76 h
Module Coordinator	**Name** Julia Menk **Phone** +41 031 910 22 57 **Email** julia.menk@bfh.ch **Address** Bern University of Applied Sciences, School of Agricultural, Forest and Food Sciences, Länggasse 85, 3052 Zollikofen
Lecturers	• Dr. Luuk Dorren • Oliver Gardi • Christian Ginzler (WSL) • Mark Günter • Julia Menk • Dominique Weber
Entry Requirements	• ArcGIS (obtainable from the teaching staff) must be installed successfully on the own laptop
Learning Outcomes and Competences	After completing the module, students will be able to: • understand, how Geographical Information Systems (GIS) can make a significant contribution to challenging projects in a spatial context; • design spatial samplings • consistently integrate (mobile GIS based) field recordings and existing spatial data into a GIS • carry out complex spatial and thematic analyses for environmental problem solving • present the resulting information in meaningful maps, reports and graphics
Module Content	• Introduction and principles of GIS • GIS methods und methodologies for data acquisition and validation • GIS tools for spatial data processing and consistent data storage • Advanced spatial and thematic queries and statistics • Complex analyses of surfaces and networks • Automation of spatial analyses with ArcGIS-ModelBuilder • Remote sensing with satellite images, aerial photographs and LiDAR • Data collection with a mobile GIS and GPS • Creation of meaningful, appealing maps, reports and graphics • Introduction to SAGA-GIS, Quantum GIS, GIS with standard Office software

Teaching / Learning Methods	Lectures, guided exercises, case studies, self-study
Assessment of Learning Outcome	1) Successful completion of individual weekly GIS attestation exercises (pre-condition for passing the module) 2) Written final exam (100%)
Bibliography	Allen DA, 2011. Getting to know ArcGIS Model Builder. Chang KT, 2016. Introduction to geographic information systems. Longley PA, 2011. Geographical information systems and science. Fox, L., 2015, Essential earth imaging for GIS. Fu P, Sun J, 2011. Web GIS: principles and applications. Clemmer G, 2010. The GIS 20: essential skills. Gabathuler E, 2012. Mapping and geoprocessing tools in support of rural advisory systems: virtual globes, global positioning system, and geographic information systems: simple applications, case studies, and guidelines. Universität Bern, CDE. Wade T, 2006. A to Z GIS: an illustrated dictionary of geographic information systems.
Language	English
Comments	Some sequences are compulsory for students. For details on compulsory sequences, please refer to the detailed schedule of the module, which will be uploaded on Moodle four weeks before the start of the module.
Last Update	04.03.2019 / Julia Menk