Module	**Relational Databases**
Code	V5_10
Degree Program	Master of Science in Life Sciences (MSLS)
ECTS Credits	2
Workload	60: 30h Lectures and Exercises, 30h Self-Study
Module Coordinator	**Name** Dr. Robert Vorburger **Phone** +41 (0)58 934 57 44 **Email** robert.vorburger@zhaw.ch **Address** ZHAW Zurich University of Applied Sciences Life Sciences and Facility Management Schloss 1 CH-8820 Wädenswil
Lecturers	Dr. Robert Vorburger, Adrian Busin
Entry Requirements	The course requires basic knowledge in the following topics: • Programming in Python • Statistical programming in R The scripting language Python as well as the statistical computing environment R are used in this module to create and process relational databases using SQL (structured query language). Prior knowledge of SQL is not required.
Learning Outcomes and Competences	While knowledge is usually engineered using statistical methods, the basis is always a well-structured set of data. This module covers the techniques and structures used to efficiently create, read, update, and delete (CRUD) data in a relational databases. By completing the module, students will specifically acquire knowledge and skills in the following fields: • Terminology and general basics of relational databases • Writing database queries using SQL • Using SQL in Python and R
Module Content	• Basic principles and concepts of relational databases including entity integrity and referential integrity • Entity-Relationship Model and Database Schema • Open Database Connectivity (ODBC) • Relational Database Management Systems such as MySQL • Embedded databases such as SQLite • Introduction to the Structured Query Language (SQL) • Python and SQL (hands-on in a life science scenario)R and SQL (hands-on in a life science scenario)
Teaching / Learning Methods	• Lectures : ~40% classical teaching / ~30% guided exercises • Self-Study : ~20% exercises / ~10% literature studying

Assessment of Learning Outcome	Written exam (100%) pass/fail
Bibliography	Important additional literature will be provided on Moodle.
Language	English
Comments	Data [ˈdeɪtə]: Borrowing from Latin *data*, nominative plural of *datum* (“that is given”), neuter past participle of dō (“I give”).
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