



Module	Relational Databases
Code	tbd
Degree Program	Master of Science in Life Sciences (MSLS)
ECTS Credits	2
Workload	60: 30h Lectures and Exercises, 30h Self-Study
Module Coordinator	<p>Name Dr. Robert Vorburger</p> <p>Phone +41 (0)58 934 57 44</p> <p>Email robert.vorburger@zhaw.ch</p> <p>Address ZHAW Zurich University of Applied Sciences Life Sciences and Facility Management Schloss 1 CH-8820 Wädenswil</p>
Lecturers	<ul style="list-style-type: none"> • Dr. Robert Vorburger
Entry Requirements	<p>The course requires basic knowledge in the following topics:</p> <ul style="list-style-type: none"> • Programming in Python • Statistical programming in R <p>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.</p>
Learning Outcomes and Competences	<p>Yes, it is true: <i>Data Scientist</i> is the sexiest job of the 21st century (at least according to the Harvard Business Review). While knowledge is usually engineered using statistical methods, the basis is always a well-structured set of data. The module covers the techniques and structures used to efficiently store, process, and load data in databases.</p> <p>By completing the module, students will specifically acquire knowledge and skills in the following fields:</p> <ul style="list-style-type: none"> • Terminology and general basics of databases and data architecture systems • Relational databases and SQL • Python/R and SQL
Module Content	<p>The module basically consists of four parts:</p> <ul style="list-style-type: none"> • <i>Part I - Data and Data Architecture</i> <ul style="list-style-type: none"> ○ What is data? ○ How is data stored and processed? ○ Databases vs file systems ○ Database-Management-Systems ○ Different types of databases: <ul style="list-style-type: none"> ▪ hierarchical ▪ network-oriented ▪ relational

	<ul style="list-style-type: none"> ▪ object-oriented • <i>Part II - Relational Databases</i> <ul style="list-style-type: none"> ○ Basic principles: entity integrity and referential integrity ○ Entity-Relationship-Model ○ What is ODBC? ○ SQL (talk to the database) ○ Python and SQL (hands-on in a life science scenario) ○ R and SQL (hands-on in a life science scenario)
Teaching / Learning Methods	<ul style="list-style-type: none"> • 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 ['dɛɪtə]: Borrowing from Latin <i>data</i> , nominative plural of <i>datum</i> ("that is given"), neuter past participle of <i>dō</i> ("I give").
Last Update	