


Information: Specialized Master's Programme Data Science

Tuesday, 31 October 2023



Data Science

Master of Science ETH

Agenda

- What is Data Science?
- Structure Master's programme Data Science
- Design principles
- Eligibility
- Application + Documents



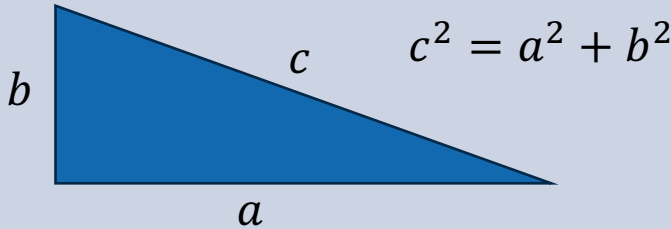


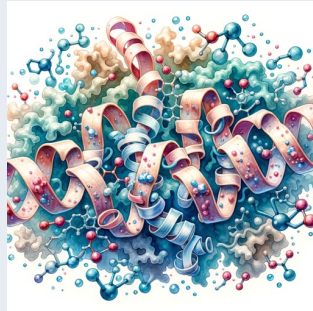
e-pics | Bildarchiv, ETH-Bibliothek

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Four paradigms in science

| | Ontological The world as it should be (necessary) | Epistemic The world as it is (contingent) |
|--|--|---|
| Thinking With brains (natural) | Mathematics (theoretical)  | Physics (empirical)  |
| Computing With computers (artificial) | Computer science (computational)  | Data science (data driven)  |

What is Data Science?

A field in computer science that uses scientific methods, algorithms, and technologies to extract insights and knowledge from structured and unstructured data.

It combines various fields including mathematics, computer science, electrical engineering, and information theory to analyze and interpret data.

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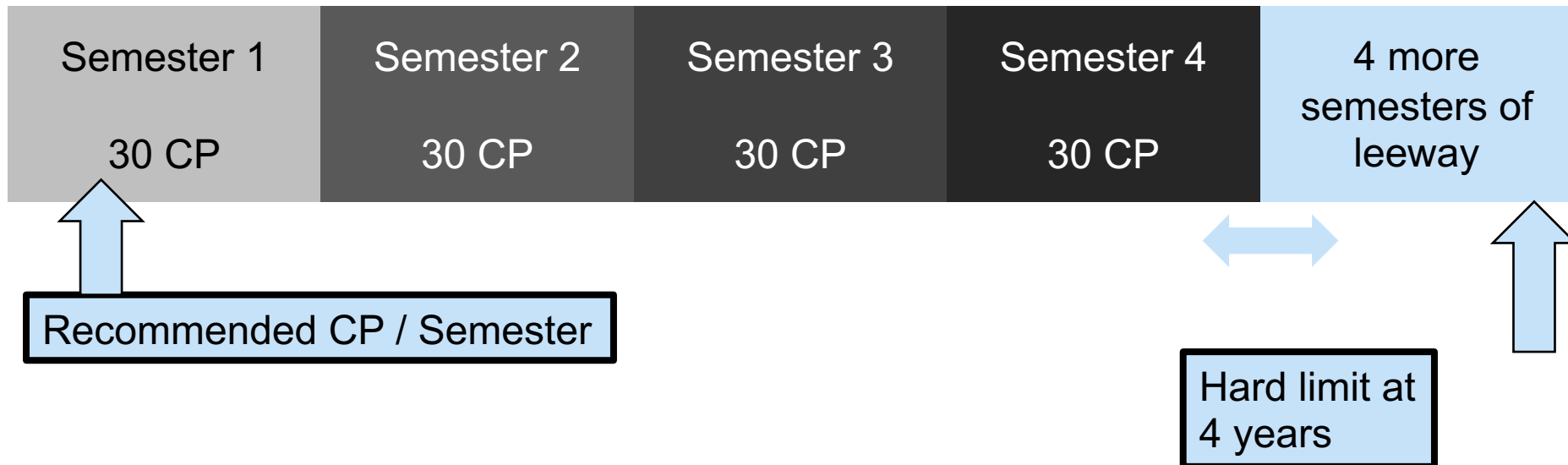


Structure

| | | |
|--------------------------------|----|-----|
| Master in Data Science | | 120 |
| Core Courses | | 32 |
| Data Analysis | 16 | |
| Data Management und Processing | 16 | |
| Electives | | 28 |
| Subject-specific Electives | 20 | |
| Interdisciplinary Electives | 8 | |
| Additional Electives | 0 | |
| Data Science Lab | 10 | |
| Seminar | 2 | |
| Science in Perspective | 2 | |
| Master's Thesis | 30 | |

120 Credit points

The master's programme is designed to be completed in 4 semesters. The overall study duration may not exceed 8 semesters. The last semester is completely focused on the Master's thesis.

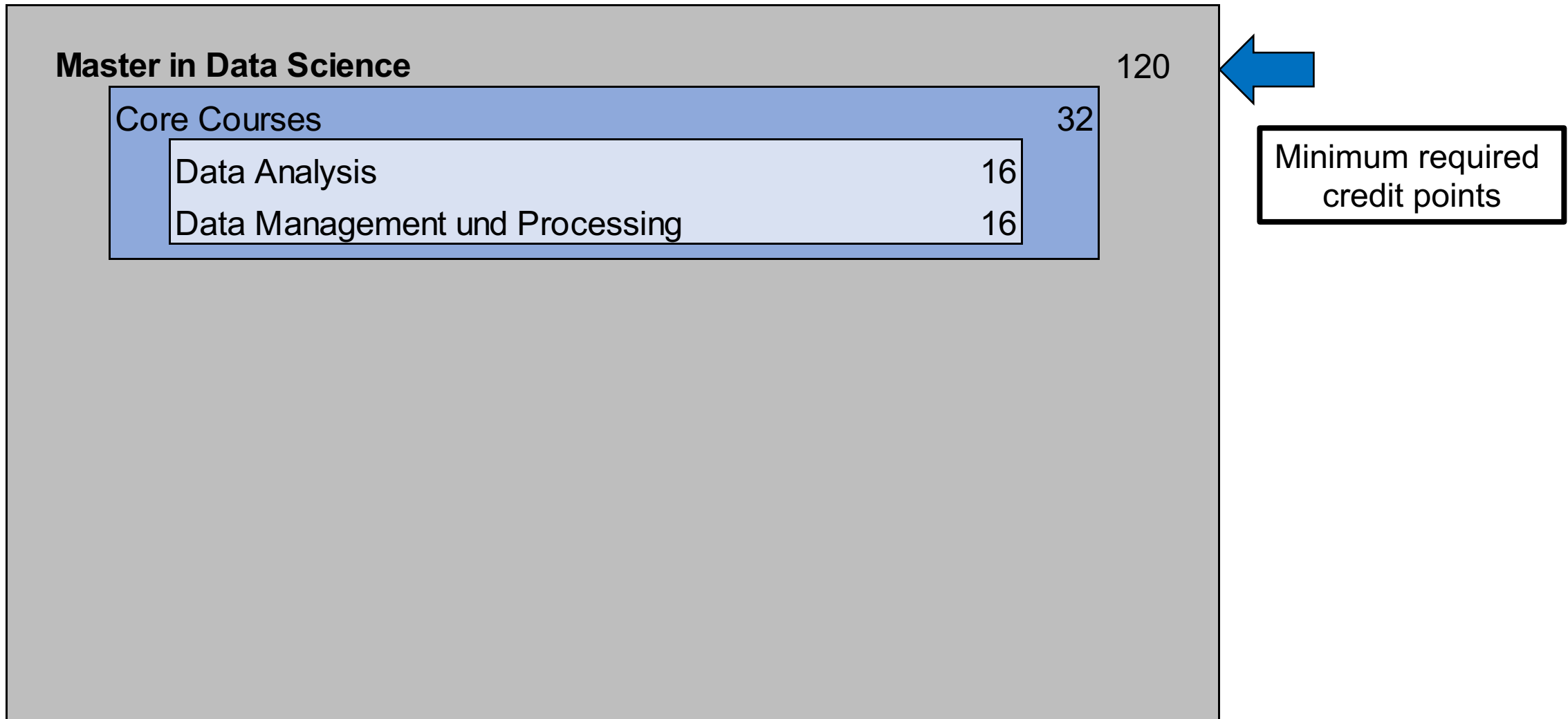


Programme structure

Master in Data Science

120

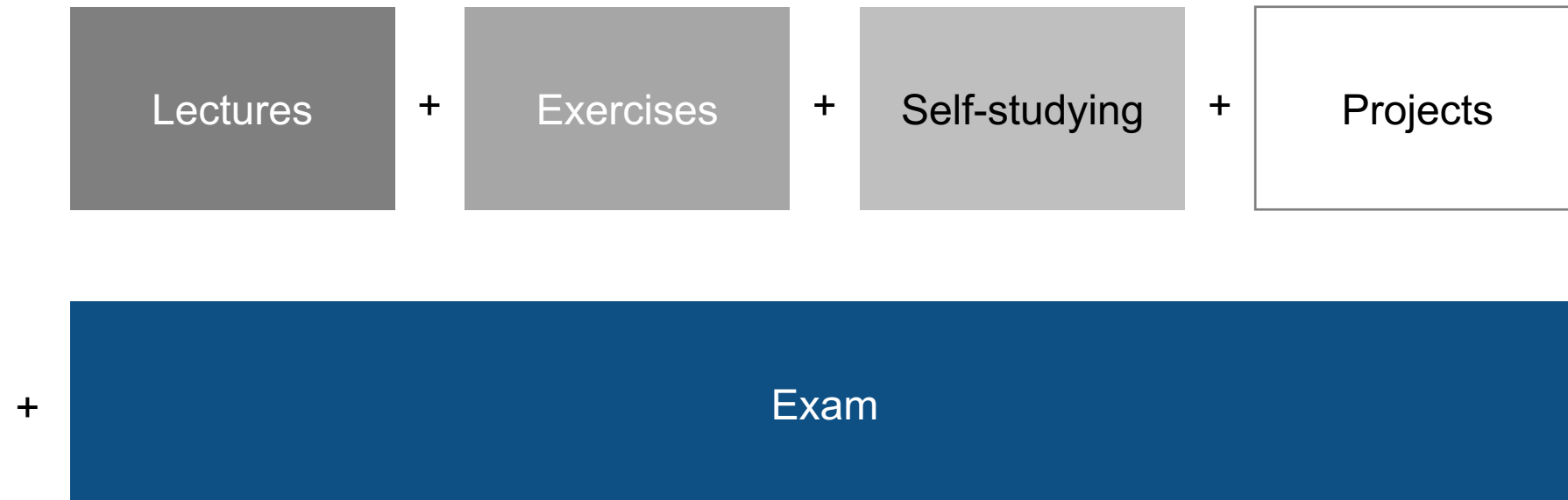
Programme structure



Core courses

High level of competence in Data Science

Solid and sound knowledge basis.



Core courses

(tentative list)

Roughly:

At least *two* here

Data Analysis

ev. Advanced Machine Learning (10)
Probabilistic Artificial Intelligence (8)
Mathematics of Information (8)
Mathematics of Data Science (8)
Computational Statistics (8)

At least *two* here

Data Management and Processing

Big Data (10)
Data Management Systems (8)
Optimization for Data Science (10)
Algorithmic Foundations of Data Science (10)
Advanced Algorithms (9)

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Electives

(tentative list)

Roughly:

At least *three* here

Subject-specific Electives

A lot of choice across CS, Math, EE (30+ courses)

At least *two* here

Interdisciplinary Electives

Select courses from one specific area

Additional Electives

All courses on master's level from D-INFK, D-ITET, D-MATH and all courses listed in the Interdisciplinary Electives

Interdisciplinary Electives



ETH Studieninformationstage 2022

Bridge the *gap* with other **disciplines**
cultures
mindsets

8-12 credits

Data Science would not exist without

Interdisciplinary Electives

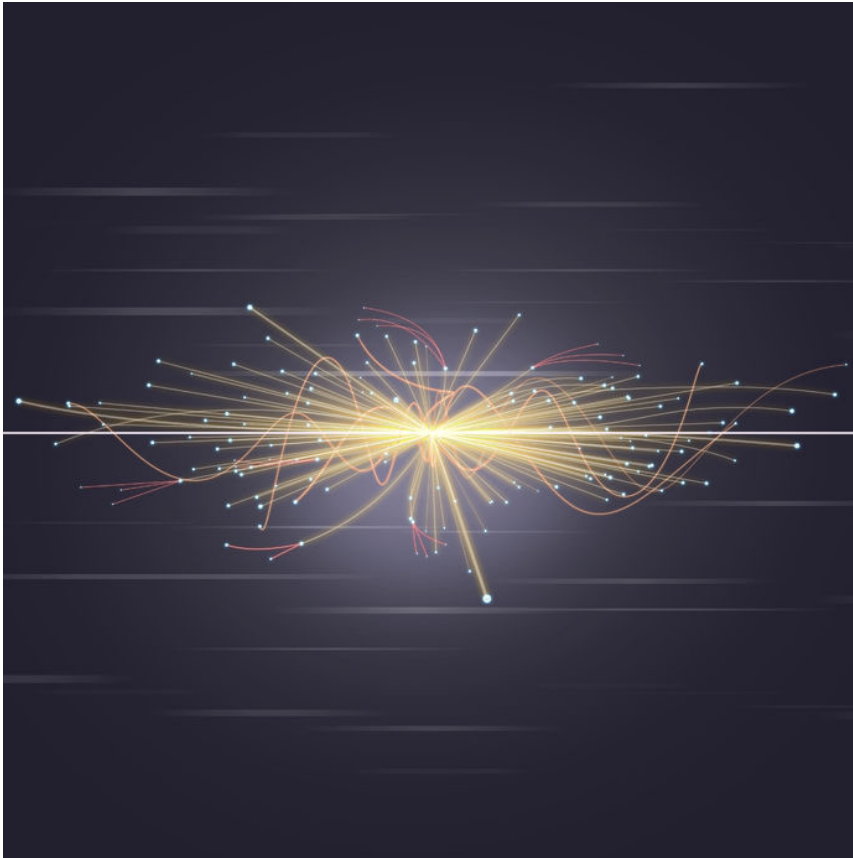


Course compilations

- Computational Biology, Bioinformatics, and Biomedicine
- Computer Networks
- Finance & Insurance
- Geographic Information Systems
- Law, Policy, and Innovation
- Neural Information Processing
- Social Networks
- Transport Planning and Systems
- Weather and Climate Systems

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Apply your knowledge and skills to

Interdisciplinary projects

Groups of three students
+
Presentation

Programme structure

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Seminar



Read and *understand* publications

Present a research paper

Get involved in *discussions*

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Science in Perspective



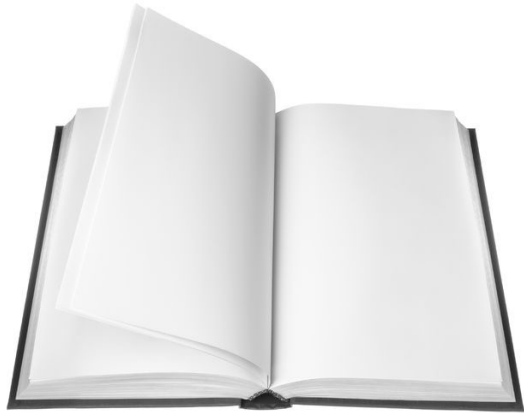
Humanities and *Social Sciences*

Language courses 851-xxxx-xx
(≤ 3 credits including ETH BSc)

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Master's Thesis



This is the *final step*!

6 months of *research*
and *complex problem*
solving

(And think about your future... maybe a *doctorate*?)

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16 up to you

Does not sum up:
freedom

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Design Principles Master in Data Science

- Solid and sound knowledge in analyzing and handling of big data
- Specialized knowledge in a research area
- First experience in handling real data



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Target Group

Qualifying bachelor's programs

- Bachelor in Electrical Engineering and Information Technology
- Bachelor in Computer Science
- Bachelor in Mechanical Engineering
- Bachelor in Mathematics
- Bachelor in Physics



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Application & Admission, AS 2024

Admission Office: presentations at 12:15

Further information

<https://ethz.ch/en/studies/master.html>



Information

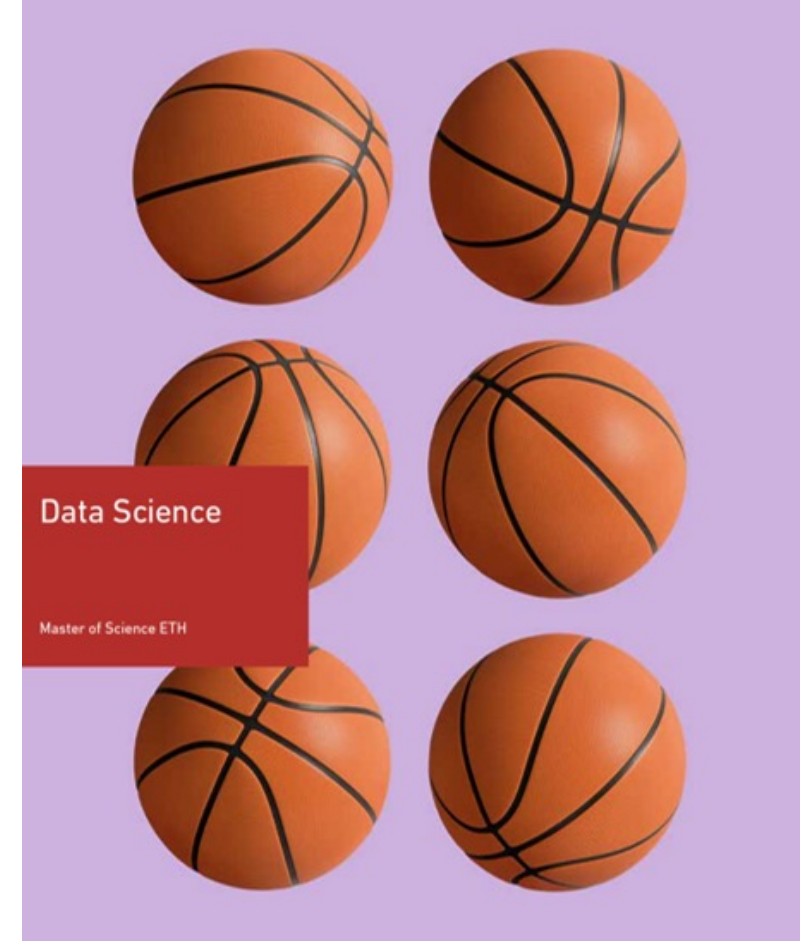
Data Science:

www.inf.ethz.ch/data-science

- Study guide
- Regulations of study
- Recommended reading
- ...

Admission office:

<https://www.ethz.ch/en/studies/registration-application/master/application.html>



Information

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