Universität Basel

Departement
Mathematik und Informatik

Master of Science in Data Science

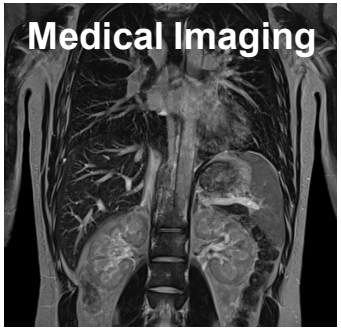
What is Data Science?

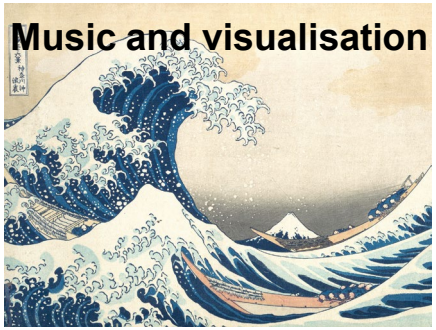
– Data Science
  - deals with vast volumes of data (Big Data)
  - uses modern tools and techniques too analyze these data
  - helps to find unseen pattern, derive meaningful information …
  - combines tools from mathematics, statistics, computer science, and engineering

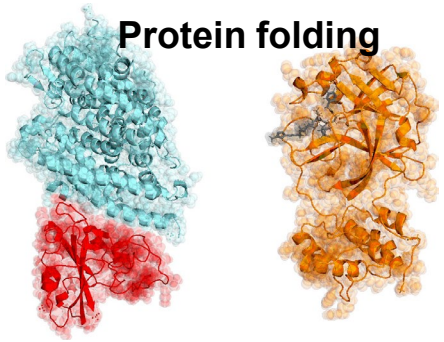
– Data Science is a method for
  - effectively extracting knowledge from data
  - facilitating data-driven decision making
  - solving complex industrial & scientific challenges

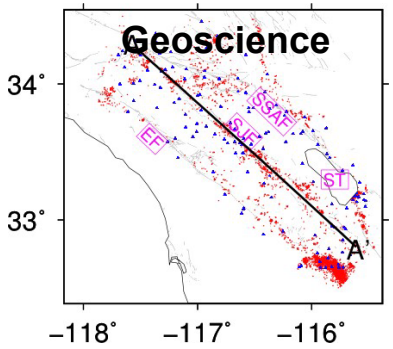
→ Data Science is getting more and more important nowadays

Where can we use Data Science?









Master's Program in *Data Science* at the University of Basel

– Interdisciplinary study program

– Combination of solid fundamentals and applied areas

- Mathematics, Statistics & Machine Learning
- Systems and Software Design courses
- Project & Teamwork

→ perfect infrastructure for efficient and secure handling of modern datasets

– Excellent teaching and close links to the cutting-edge research

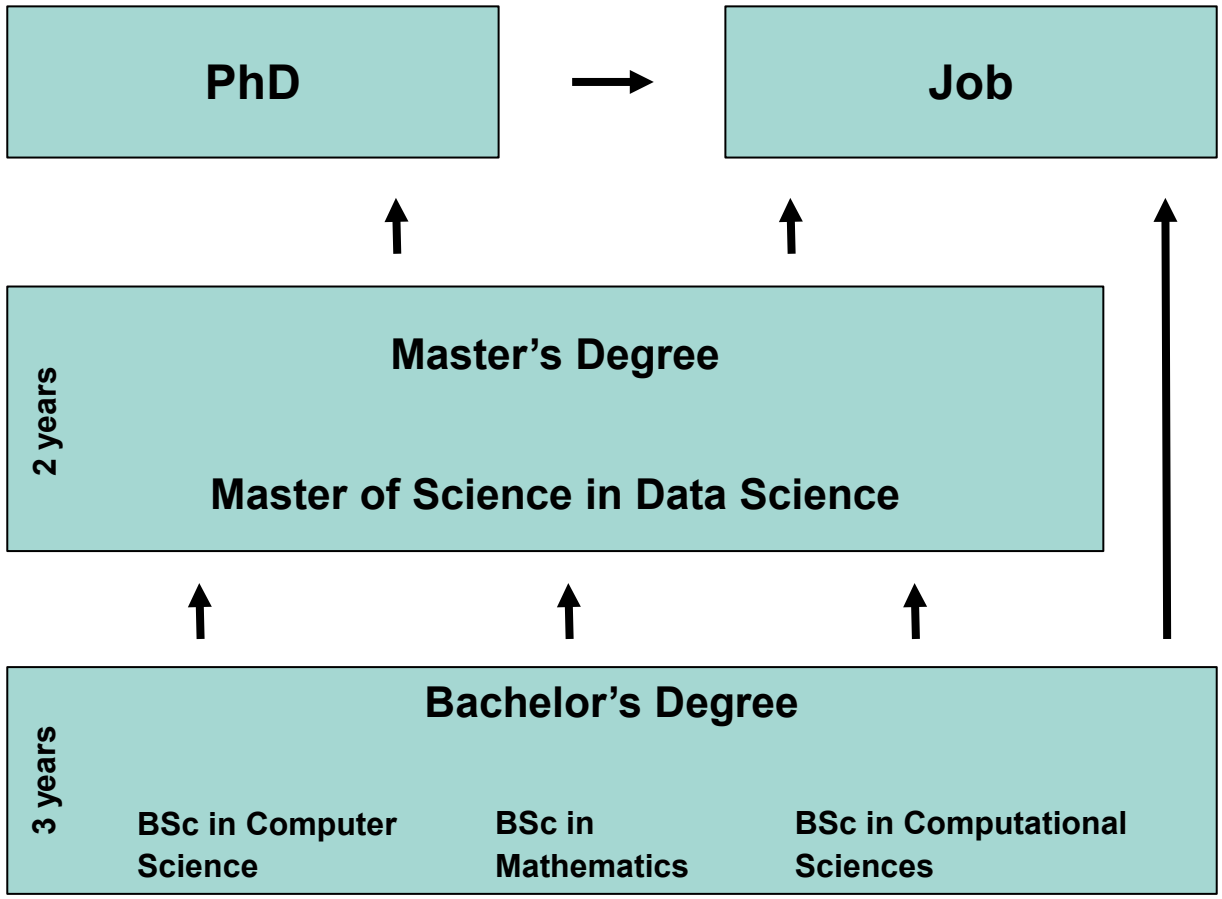
– Ideal supervision ratio

Master in *Data Science*

- Research
- Industry
- Academia
- …

- Foundations in Mathematics, Machine Learning …
- Project Management
- …

- Computer Science Training
- …

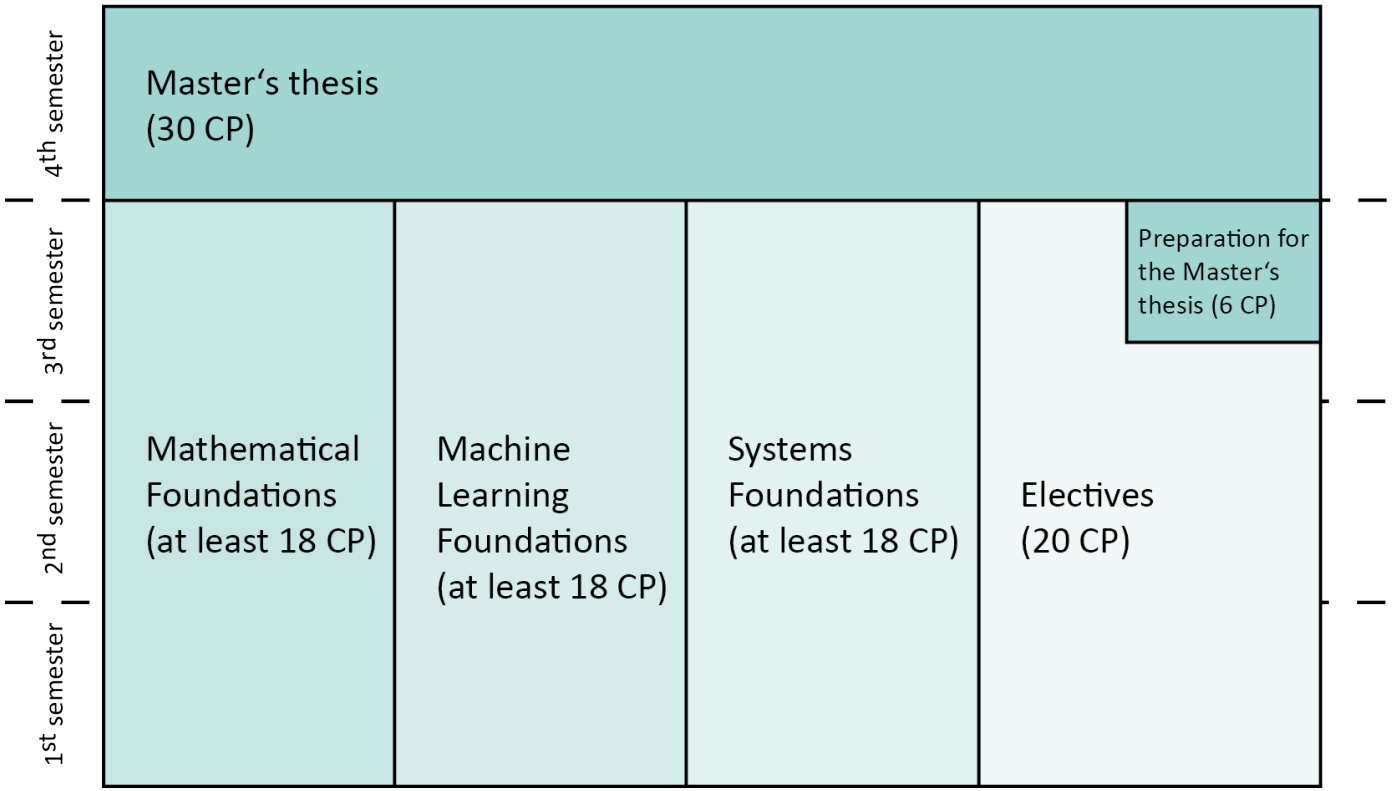


Master in *Data Science*

- A successfully completed Bachelor's program is required
- The Master's Program lasts 4 semester (full-time)
    - Part-time studying is possible
- The program awards 120 ECTS
- International orientation
    - The course language is English
- Start of the program:
    - It is possible both in the autumn and the spring semester
    - A start in the autumn semester is highly recommended
- Degree**:**

    Master of Science in Data Science

Master's Program *Data Science:* Overview



Master's Program *Data Science:* Details

– **Mathematical Foundations** (at least 18 CP)
  - **(+)** Mathematics of Data Science (8 CP)
  - Statistical Modeling (6 CP)
  - …

– **Machine Learning Foundations** (at least 18 CP)
  - **(+)** Machine Learning (8 CP)
  - Machine Learning on Graphs, Groups, and Manifolds (6 CP)
  - Machine Learning Project (6 or 12 CP)
  - …

– **Systems Foundations** (at least 18 CP)
  - **(+)** Foundations of Distributed Systems (8 CP)
  - High performance Computing (4 CP)
  - Systems Project (6 or 12 CP)
  - …

Master's Program *Data Science:* Details

– **Electives** (20 CP)
  - Scientific Writing (6 CP)
  - Data Science Project (6 or 12 CP)
  - …

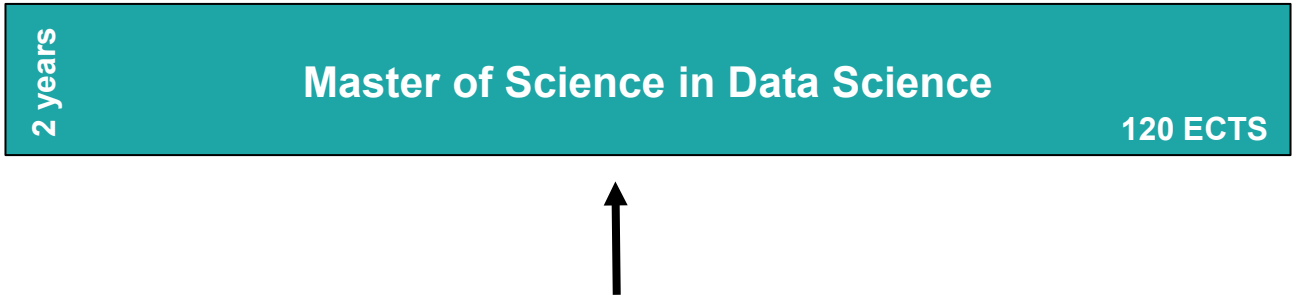
– **Preparation for the Master's Thesis** (6 CP)
  - One month in full-time
  - Presentation of the project plan
  - Pass / Fail

Master's Program *Data Science:* Details

– **Master's thesis** (30 CP)
  - Can be started if the Preparation of the Master's thesis and 76 CP out of the other modules are completed
  - 6 month in full time
  - 30 minute presentation of the results

  - **Center for Data Analytics** of the University of Basel: provides real datasets from a variety of disciplines for your Master's thesis

Access to the Master's Program *Data Science*



Bachelor Degree in:
- Computer Science, Computational Science, Mathematics, etc.

&

Admission without additional requirements if
90 ECTS basic knowledge in Mathematics & Computer Science is fulfilled

&

minimum grade of **5.0 (Swiss grading system)** in your Bachelor Degree

Access to the Master's Program *Data Science*

– **You should have basic knowledge in the following fields of Mathematics and Computer Science (90 ECTS)**

- Analysis and Linear Algebra (at least 20 ECTS)
- Numerical Analysis (at least 4 ECTS)
- Probability and Statistics (at least 8 ECTS)
- Programming (at least 12 ECTS)
- Algorithms and Data Structures (at least 8 ECTS)
- Databases (at least 6 ECTS)
- Scientific Computing / Pattern Recognition (at least 12 ECTS)
- Scientific Communication (at least 3 ECTS)

Data Science Research in Basel

Machine Intelligence

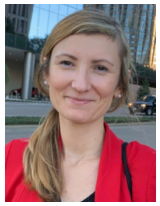
Data Analytics
Prof. Ivan Dokmanić

Artificial Intelligence
Prof. Malte Helmert

Optimization of Machine Learning Systems
Prof. Aurelien Lucchi

Biomedical Data Analysis
Prof. Volker Roth

Distributed Systems



High Performance Computing
Prof. Florina Ciorba

Databases and Information Systems
Prof. Heiko Schuldt

Computer Networks
Prof. Christian Tschudin

Cyber Security
Prof. Isabel Wagner

Numerical Analysis

Numerical Analysis
Prof. Marcus Grote

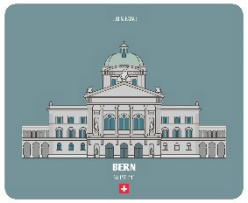
Computational Mathematics
Prof. Helmut Harbrecht

Probability Theory and Statistics

Statistical Science
Prof. Dr. Jiří Černý

Occupational Fields

- IT industry
- Chemical and pharmaceutical industry
- Healthcare
- Research positions
- Academia
- Banking and insurance companies
- Automotive industry
- Government and administration
- Policymaking



Application & Deadlines

- 30.04.2025 Application deadline for the Master's Program (start September 2025)
- 15.09.2025 Start Fall Semester 2025

- 30.11.2025 Application deadline for the Master's Program (start February 2025)
- 22.02.2027 Start Spring Semester 2027

- Possible requirements can be completed in parallel to the master courses

- Information regarding the application:

  https://www.unibas.ch → Information for Prospective Students

  → Application & Admission

Contact

Program Coordinator:
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Universität
Basel

Departement
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Thank you.