Profile of the Consecutive Master's Degree Program in Bioinformatics

- **Interdisciplinary research-oriented** degree program
- **Standard program duration**:
  4 semesters
- **Credits**:
  120
- **Language of instruction**:
  English (international program)
- **Examinations** are administered during the program
- **Program start**:
  only winter semester (mid-October)
- **Application period**:
  mid-April – 31 May

Admission Requirements

- **Bachelor's degree** in bioinformatics with components in mathematics, computer science, chemistry/biochemistry, biology, and bioinformatics that correspond to the bachelor's degree program in bioinformatics at Freie Universität Berlin, or an equivalent degree.
- **Proof of English language skills** (level B2 CEFR or equivalent). English as a school subject for 6 years is equivalent to level B2.

Further Information

APPLICATION AND ENROLLMENT

Student Services Center (SSC)
www.fu-berlin.de/en/studium/beratung/ssc/
E-Mail: *info-service@fu-berlin.de*

PROGRAM-SPECIFIC QUESTIONS

Studiengang Bioinformatik
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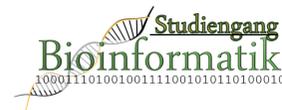
www.mi.fu-berlin.de/en/bioinf/stud/master/
E-Mail: *bioinf@math.fu-berlin.de*

Program Office: Ulrike Seyferth
Program Director: Prof. Dr. Tim Conrad

OSA (Online Studies Selection Guide)

OSA | ONLINE STUDIENFACH WAHL ASSISTENTEN

www.osa.fu-berlin.de/bioinformatics_msc/en/start/
starting_page/index.html

Freie Universität Berlin

M.Sc. Bioinformatics

International Graduate Program

Photo: www.istockphoto.com

Jointly conducted with

CHARITÉ
UNIVERSITÄTSMEDIZIN BERLIN

Master's Degree Program in Bioinformatics

Our 2-year Master's degree offers a unique interdisciplinary training program that emphasizes the application of computational methods for interpreting complex biological data and understanding the underlying systems. It provides both in-depth theoretical knowledge as well as applied training in bioinformatics. The program is jointly conducted by the Department of Mathematics and Computer Science, the Department of Biology, Chemistry and Pharmacy, and the Charité Medical School.

A unique aspect of our Master's Program is the close collaboration with well-known research institutes in Berlin:

- Max Planck Institute for Molecular Genetics
- Zuse Institute Berlin
- Leibniz Institute of Freshwater Ecology and Inland Fisheries
- Leibniz Institute for Zoo and Wildlife Research
- Max Delbrück Center for Molecular Medicine
- Robert Koch Institute

MPIMG

ZUSE INSTITUTE BERLIN

IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries

Leibniz Institute for Zoo and Wildlife Research
IN THE FORSCHUNGSVERBUND BERLIN E.V.

MDC MAX DELBRÜCK CENTER FOR MOLECULAR MEDICINE IN THE HELMHOLTZ ASSOCIATION

ROBERT KOCH INSTITUT

Overview

Bioinformatics is a rapidly growing branch of life sciences that deals with modeling, simulating, analyzing, and interpreting complex systems and large data sets from biology and biomedicine. It is truly interdisciplinary and combines mathematics and computer science with medicine, biology, and (bio-) chemistry. One of the driving factors within this field is the steady advancements in biotechnology and -omics technologies which leave biologists and medical researchers frequently overloaded with large data sets that need to be stored, processed, and analyzed. Bioinformatics provides tools to interpret these data and understand the underlying complex biological systems ranging from entire ecological systems to specific human diseases, to cellular and molecular networks.

Image credit: John E. Stone (under CC BY-SA 4.0 license)
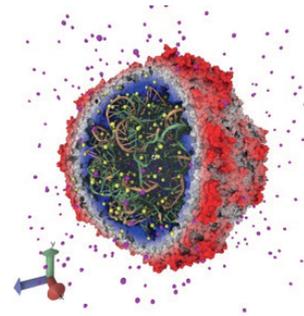
The students of this interdisciplinary Master's program will get unique hands-on learning experience in bioinformatics skills and acquire expertise in current theories and up-to-date technologies. This is complemented by improving their own teamwork and interpersonal competency in an international environment. This solid background in theory and practice together with the necessary soft-skill set will allow the students to continue their career paths in academia or industry.

Specialization

In addition to the general bioinformatics courses, students choose a specialization area, based on their personal preferences.

COMPLEX SYSTEMS
Sophisticated techniques for modeling, simulation, and analysis of complex networks and dynamic processes pave the way for understanding systems ranging from molecular interaction networks to ecosystems. They are the focus of this specialization area.

DATA SCIENCE
This specialization puts the data in the center. State-of-the-art analysis and knowledge extraction techniques from modern statistics and machine learning will be explored and applied to realistic data-sets. Consequences from the data generation process and big-data topics will also be considered.

ADVANCED ALGORITHMS
The emphasis lies on advanced algorithms for bioinformatics analyses. This includes methods to generate search indices for very large sequencing data, efficient protein and RNA analysis, and the necessary computer science foundations to analyze and develop novel and efficient algorithms.