PHYSICS OF LIFE

Master's degree program
Master of Science: M Sc in Physics of Life

Breakthroughs in life science research often occur at the interface between biology and physics, chemistry, mathematics, programming, as well as engineering. In the past, this has led to revolutionary developments of new methodologies, such as super-resolution microscopy, magnetic resonance techniques, and DNA sequencing techniques. Furthermore, scientists with training in physical and mathematical sciences, as well as engineering, have made broadly impactful contributions to the understanding of living systems by introducing quantitative concepts and theoretical models. This has not only led to innumerable discoveries at the atomic and molecular scale but also at the cellular, multicellular, and ecosystems scale, and for the origin of life itself. As recent developments of molecular techniques have led to the rapid acquisition of huge amounts of quantitative data for biological systems, the impact of scientists with training in physics, mathematics, computer science, and engineering is expected to grow. To accelerate future discoveries in life sciences, the MSc Physics of Life therefore trains students with a BSc education in physical sciences, mathematics, computer science, and engineering in the concepts and techniques of frontier research in life sciences.

Focal area of teaching and research

The MSc Physics of Life offers courses and research training in both experimental and theoretical approaches. The major focus of the MSc Physics of Life program are research projects: Two smaller research projects and a longer research project for the Master thesis. These projects are conducted in research groups at the Biozentrum, or in research groups at other departments within the Faculty of Science at the University of Basel, the Department of Biomedicine, the Department of Biomedical Engineering, the Friedrich Miescher Institute for Biomedical Research, or the Swiss Tropical and Public Health Institute. This practical research is supplemented by attending courses in Physics of Life, and courses in your field of choice, which may include courses from physics, mathematics, computer science, chemistry, biochemistry, cell biology, genetics, developmental biology, biophysics, structural biology, microbiology, infection biology, immunology, neurobiology, pharmacology and computational biology – a wide variety of options for theoretical and experimental topics are available.
Through the combination of coursework and research projects within the MSc Physics of Life program, you will be able to identify important biological research questions and deploy appropriate physical, mathematical, or biological methods to address these questions. You will also have the practical experience to complete a research project and the skills to communicate your results.

Course structure Master studies

The Master of Science degree is the postgraduate degree after the Bachelor's programme. The Master's degree program Physics of Life awards 90 ECTS credits and is a so called «mono-course» consisting of only one core subject.

Curriculum Master's Degree in Physics of Life	CP
Foundations in Physics of Life	18
Research projects	20
Electives (inside MSc programs of the Phil Nat Faculty, at least 6 KP in Msc Molecular Biology)	12
Master's thesis	30
Master's examination	10
Total	90

One ECTS credit point (CP) roughly equals 30 hours of study.

Course language
The language of instruction is English. The Master's thesis is generally written in English.

Exams
Student performance is assessed through course accompanying certificates, proof of course participation according to study contracts, a Master's thesis, and through a Master's examination.

Language stays / Internships
No language stays or internships are required.

Combination of subjects
The degree programs at the Faculty of Science are generally mono-courses.

Start of program
The Master's program Physics of Life can be started in the fall or the spring semester.

Duration of study
The Master's program generally lasts three semesters (90 CP). However, there are no restrictions on the duration of study.

Further degrees
Doctorate: A Master's degree in Physics of Life builds the basis for doctoral studies (PhD) in Life Sciences, Physics, or Chemistry. The doctoral studies usually take three to four years and are completed with a written thesis and oral exam covering the postgraduate studies in the doctoral subject.

Career opportunities
The Master of Science in Physics of Life opens up diverse career perspectives. These include a research career at a university or in industry, work in the lab or at a school, in a patent attorney firm or in consulting, bioinformatics, or science journalism. With your knowledge of biological processes and your training in quantitative methods, many doors open up for you in biomedicine, biotechnology, the pharmaceutical and food industries, at universities, or in public organizations. For a career in research, a PhD is typically required.

Admission
The admission to the MSc Physics of Life requires a Bachelor of Science (BSc) degree with at least 180 CP. If this BSc was obtained at a Swiss university, it must satisfy one of these two criteria:

a) Either the BSc comprises at least 150 CP in one of the following «*fields of study*»[1]: Physics, mathematics, computer science, computational science and engineering, chemistry, biochemistry, life sciences and technologies, mechanical engineering, civil engineering, electrical engineering, micro engineering, material science, chemical engineering.

b) Or the BSc comprises at least 150 CP from more than one of the following «*fields of study*»[1]: Physics, mathematics, computer science, chemistry, biochemistry, and biology, but at least 60

CP of these 150 CP must be from the «*fields of study*» Physics, mathematics, computer science, and chemistry.

If the BSc degree was obtained at a university outside of Switzerland, the equivalence of the BSc to the above-mentioned criteria for Swiss BSc degrees are evaluated by the teaching committee of the MSc Physics of Life.

[1]Note regarding «*fields of study*»: The list of all «*fields of study*» at universities in Switzerland is published by https://swissuniversities.ch. For university degree programs in Switzerland, you can find out which «*field of study*» is formally associated with the degree program by looking up the details of this degree program at https://studyprogrammes.ch.

Further information, guidelines, and regulations for the Master's degree program Physics of Life: https://biozentrum.unibas.ch/msc-physics-of-life
Binding information under: https://unibas.ch/admission

Application

Application system. https://unibas.ch/application. The application fee is CHF 100.-. Generally, the application deadline for the fall semester is April 30 and the application deadline for the spring semester is November 30. For students who are currently enrolled at the University of Basel, the application deadlines may differ and are published here: https://www.unibas.ch/de/Studium/Im-Studium/Rueckmelden/Masterstudium.html.

Enrollment

The letter of admission informs students on the procedure of enrollment. In general, students with a Swiss educational background do not have to be present in person for enrollment.

Tuition fees and scholarships

Tuition fees per semester (also for examination semesters): CHF 850.-
Individual costs of living etc. are not included.

Scholarships and student loans: Applications should be sent to the responsible office of the canton in which the parents are eligible to pay their taxes.

Mobility

Semesters abroad are possible and supported by scholarship programs. The mobility programs facilitate the stay at other Swiss universities or foreign universities. Further Information: Student Exchange, Petersplatz 1, 4001 Basel, T +41 61 207 30 28, mobility@unibas.ch

Further information

Guidelines and regulations of the Master's degree program in Physics of Life are compiled here: https://biozentrum.unibas.ch/msc-physics-of-life

Information about the University of Basel

- The course directory («Vorlesungsverzeichnis») can be found at: https://unibas.ch/vv
- Basler Studienführer: https://studienberatung.unibas.ch
- Homepage: https://unibas.ch

Student advice

Questions regarding the Master's degree program of Physics of Life can be discussed personally with the study coordinator or the study counselor (registration via e-mail).

Contacts

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