

Recommended courses for the Summer Semester 2025 for: BIO-LIFE, BIO-BASIC, and INFO-INFO

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This document is intended as a guideline to courses covering the study areas of Advanced Life Sciences (Bio-LIFE), Foundations of Life Sciences (Grundlagen der Lebenswissenschaften) (BIO-BASIC), and Advanced Computer Science (INFO-INFO). Additional information, important notes, and other details are included throughout the document — please make sure to read everything carefully.

Advanced Life Sciences (BIO-LIFE)

Please note that courses offered in the field of Life Sciences are not all listed under the BIO-LIFE category in Alma, as the range of offerings is too large. Also, please be aware that (unfortunately) many biology lectures are only offered as block courses.

Students may attend lectures or seminars (but not lab courses) in biology from the 3rd year of the bachelor's program onwards, as well as all courses in the master's program, including master's-level courses in chemistry, biochemistry, and pharmacy.

Please note that courses in these areas that cover topics such as bioinformatics, mathematics, computer science, or similar subjects (e.g., *Bioinformatics Methods in Microbiology*, *Matlab for Biologists*, etc.) **cannot** be counted by bioinformatics master's students toward fulfilling the "Advanced Life Sciences" (BIO-LIFE) study area or any other study areas of the master's program.

Recommendations:

- Lecture *Advanced Concepts in Cell Biology* (BIO-4076, 3 LP)
- *Computational Ecology* (Bio-BEE-213):
Bio-BEE-212 Computational Ecology I (winter semester)
Bio-BEE-213 Computational Ecology II (summer semester)
- *Autophagy & Longevity* (Bio-CIB-206, 6 LP)
- *Frontiers in Applied Drug Design* (PHA-PMC3070, 9 LP)
- *Cognitive Neuroscience* (Bio-NEU-208, 6 ECTS)
- *Current Topics in Plant Molecular Biology* (Bio-CIB-208, 6 LP)
- *Bacterial Adaptation Mechanisms* (Bio-MIB-202, 6LP)
- *Advances in Archaeo- and Paleogenetics* (V), ASHE-6e-1, 6 LP)
- *Einführung in die Immunologie* (Bio-3134, 3 LP) (+ 7 seminars, likely not taught in English)
- *Ethik der Genetik* (Bio-ETH-200, 6 LP)
- *Ethik der Biotechniken* (Bio-ETH-203)
- *Epigenetik des Menschen* (S07SHG03 (Bio-3158), 3 LP, Seminar)
- *Advanced Evolution and Ecology* (Bio-3116, 6 LP, block course)

- *Antibiotics - Modes of Action and Resistance* (Bio-MIB-206, 6 LP, block course)
- *Molecular Therapies for Human Disease* (Bio-MED-Hum-200, 3 LP)
- *Genome Mining and Natural Product Biosynthesis* (Bio-MIB-210, 6 LP, block course)
- *Current Topics in Proteome Research* (Bio-CIB-203, 3 LP)
- *Environmental Microbiology and Geomicrobiology* (Geow-M210-V1, Geow-M210-V1, 6 ECTS)

In Addition, courses offered by the Graduate School of Neurosciences can be taken:

- *Developmental Neurobiology*
- *Molecular Cell Biology of Neurons & Glia*
- *Genetic and Molecular Basis of Neural Diseases I*

Please note the following when choosing these courses:

Grading

Some courses may be labelled as *ungraded*. If you are a bioinformatics student and require a grade, please contact the instructor at the beginning of the lecture or seminar to clarify this and request graded participation.

Registration Deadlines

Some courses may have registration deadlines that have already passed. Nevertheless, we recommend reaching out to the instructor to ask whether it is still possible to join the course.

Prerequisites

Some courses may require prior knowledge or attendance in specific lectures. Please pay attention to any prerequisites mentioned in the course descriptions.

Foundations of Life Sciences (Grundlagen der Lebenswissenschaften) (BIO-BASIC)

As part of the study area “Grundlagen der Lebenswissenschaften (BIO-BASIC)” covering 24 ECTS, students are expected to attend selected courses from the Bachelor’s programs in Biology and Chemistry to build up missing foundational knowledge. The specific choice within this elective module must be discussed at the beginning of the Master’s program with Prof. Nieselt or Dr. Zimmermann.

Examples of available courses: (* recommendations in **bold**)

Biology:

- **Biomoleküle und Zelle – lecture & practical course, 6LP, always winter semester**
- **Molekulare Biologie I, lecture, 6 LP, always winter semester**

Chemistry:

- Organische Chemie, lecture, 3 LP (practical course 3 LP), always winter semester
- Anorganische Chemie, lecture, 3 LP, always winter semester
- **Biochemie, lecture, 3 LP, always summer semester**
- Physikalische Chemie, lecture, 3 LP (practical course 3 LP), always winter semester

Note:

In addition, attending the “**Grundlagen der Bioinformatik**” lecture plus exercises (9 ECTS) is recommended for computer science students without prior knowledge of bioinformatics as part of this foundational module.

Advanced Computer Science (INFO-INFO)

In general, all courses listed under INFO-INFO can be taken. The following courses are offered in English.

Recommendations:

- *Statistical Machine Learning* (ML4201, 9 ECTS!) (can also be taken as INFO-THEO, but the extra 3 ECTS cannot be transferred)
- *Probabilistic Machine Learning* (ML4202, 9 ECTS!) (can also be taken as INFO-THEO, but the extra 3 ECTS cannot be transferred)
- Introduction to Statistical Machine Learning for Bioinformaticians and Medical Informaticians (MDZINF3310, also BIO-BIO)
- Natural Language Processing (INFO4193)

Additional notes:

A maximum of 18 ECTS from third-year Bachelor courses can be counted toward the INFO-INFO and BIO-BIO study areas combined. Please note that Bachelor-level courses may be taught in German.