# Recommended course plan for the MSc degree course Bioinformatics, variant A

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The MSc degree course Bioinformatics Variant A has been designed for students with a Bachelor's degree in Bioinformatics.

The present course plan is based on the exam regulations effective as of 1 October 2021. Its sole function is to explain these regulations and to provide recommendations as to which courses may be taken in each respective semester. For binding information please contact the examination board.
Detailed information regarding studies and exams can also be found in the exams and study regulations at: https://uni-tuebingen.de/de/74351

The MSc degree course Bioinformatics Variant A comprises the following modules:

| | |
|---|---|
| **Module *Sequence Bioinformatics*** | **compulsory, 9 ECTS** |
| **Module *Structure and Systems Bioinformatics*** | **compulsory, 9 ECTS** |
| **Seminar Bioinformatics (BIO-SEM)** | **compulsory, 3 ECTS** |
| **Study area Practical Bioinformatics (BIO- PRAK)** | **2 courses, 3 ECTS each** |
| **Study area Bioinformatics (BIO-BIO), incl. Group Project (latter is compulsory)** | **in total 15 ECTS** |
| **Study area Practical Computer Science (INFO-PRAK)** | **in total 6 ECTS** |
| **Study area Theoretical Computer Science (INFO-THEO)** | **in total 6 ECTS** |
| **Study area Advanced Computer Science (INFO-INFO)** | **In total 18 ECTS (ECTS can also be obtained by attending Bachelor courses)** |
| **Study area Advanced Life Sciences (BIO-LIFE)** | **In total 18 ECTS** |
| **Master thesis** | **30 ECTS** |

The following course plan is a recommendation only – students are not required to follow this plan. We explicitly encourage students to design their own course of study within the provisions of the exam and study regulations.

However, we do recommend to attend the courses of the Sequence Bioinformatics and Structure Bioinformatics modules in the first two subject-specific semesters, and to write the master thesis at the end of your studies during or after the 4th semester.

Please note, in addition the regulations concerning the Research Project in the study area BIO-BIO; for this, see the information in the module handbook at https://uni-tuebingen.de/en/74348

**Recommended course plan MSc Bioinformatics Variant A; start: SS2022**

| | *1st semester (summer semester 2022)* | |
|---|---|---|
| lecture + tutorials | **Structure Bioinformatics,** *Kohlbacher and Claassen*, required elective module | 9 ECTS |
| Group project | Group project **(BIO-BIO)** | 3 ECTS |
| lecture / seminar/ | *Life Sciences* **(BIO-LIFE)**, required elective modules (Biology / Chemistry /Pharmacy MSc courses) | 6 ECTS |
| lecture / seminar | *Advanced Computer Science* required elective modules **(INFO-INFO)** | 6 ECTS |
| lecture / seminar | *Bioinformatics,* required elective modules **(BIO-BIO)** | 6 ECTS |
| practical course | *Practical Bioinformatics,* required elective modules (during the lecture-free period after the semester) | 3 ECTS |
| | Total | 33 ECTS |

| | *2nd semester (winter semester 2022/2023)* | |
|---|---|---|
| lecture + tutorials | **Sequence Bioinformatics, required elective module** | 9 ECTS |
| lecture + tutorials | *Theoretical Computer Science,* required elective modules **(INFO-THEO)** | 6 ECTS |
| lecture + tutorials | *Practical Computer Science,* required elective modules **(INFO-PRAK)** | 6 ECTS |
| practical course | *Practical Bioinformatics,* required elective module **(BIO-PRAK**, during the lecture-free period after the semester) | 3 ECTS |
| lecture +/ seminar | *Life Sciences* required elective modules **(BIO-LIFE**, Biology / Chemistry /Pharmacy MSc courses) | 6 ECTS |
| | Total | 30 ECTS |

| | *3rd semester (summer semester 2023)* | |
|---|---|---|
| lecture / seminar/ | *Life Sciences* **(BIO-LIFE)**, required elective modules (Biology / Chemistry /Pharmacy MSc courses) | 6 ECTS |
| seminar | *Bioinformatics* seminar **(BIO-SEM)** | 3 ECTS |
| lecture + tutorials | *Advanced Computer Science* required elective modules **(INFO-INFO)** | 6 ECTS |
| lecture + tutorials | *Advanced Computer Science* required elective modules **(INFO-INFO)** | 6 ECTS |

| lecture / seminar/ | *Bioinformatics* required elective modules (**BIO-BIO**) | 6 ECTS |
|---|---|---|
| | Total | 27 ECTS |

| *4th semester (winter semester 2023/2024)* | | |
|---|---|---|
| module | MSc thesis | 30 ECTS |
| | Total | 30 ECTS |

**Advanced Computer Science (INFO-INFO), Empfehlungen für das SoSe22:**
Alle in ALMA unter INFO-INFO gelisteten Kurse können belegt werden, dazu auch die Bachelorkurse im Wahlbereich Informatik. Die folgende Liste ist nicht vollständig:

- MDZINF3310 Introduction to Statistical Machine Learning for Bioinformaticians and Medical Informaticians (Bachelorkurs 6 ECTS)
- INF4491 Statistical Machine Learning (9 ECTS!)
- ML4202 Probabilistic Machine Learning
- INF3145 Scientific Visualisation (Bachelorkurs)
- MEDZ4620 Biorobotics (Vorlesung und Seminar)
- INF3151 Grundlagen des Maschinellen Lernens (Bachelorkurs, belegbar wenn noch nicht im Bachelor belegt)

**Advanced Bioinformatics (BIO-BIO):**
All lectures listed in ALMA are taught in English

**Zum Bereich BIO-LIFE (Vertiefung Lebenswissenschaften):**
Bitte beachten Sie, dass Veranstaltungen, die im Bereich Lebenswissenschaften angeboten werden, nicht alle unter dem Bereich BIO-LIFE in Alma[1] aufgeführt werden, da das Angebot zu groß ist. Bitte beachten Sie, dass (leider) in der Biologie sehr viele Vorlesungen nur als Blockveranstaltungen angeboten werden.

Studierende können Vorlesungen oder Seminare (aber keine Laborpraktika) der Biologie ab 3. Jahr im Bachelor bzw. alles im Master sowie Masterveranstaltungen der Chemie, Biochemie und Pharmazie belegen.

Beachten Sie, dass Angebote in diesen Bereichen die Themen der Bioinformatik, Mathematik, Informatik oder ähnliches (z.B. Bioinformatic Methods in Microbiology, Matlab für Biologen, ...) behandeln, von Bioinformatik-Masterstudierenden **nicht** für die Erfüllung des Studienbereiches „Vertiefung Lebenswissenschaften" (BIO-LIFE) bzw. für keinen der Studienbereiche des Masterstudiums eingebracht werden können.

- Lecture *Advanced Concepts in Cell Biology* (BIO-4076, 3 LP)
- Lecture *Advanced Immunology* (BIO-4002)
- Lecture (plus Seminar) *Molecular Cell Biology* (3+3 LP)

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[1] https://alma.uni-tuebingen.de/alma/pages/cs/sys/portal/hisinoneStartPage.faces?chco=y

- *Computational Methods in Drug Discovery*, Research practical course taught individually (6 LP) -PHA-PMC3050
- *Frontiers in Applied Drug Design* (Praktikum), Research practical course taught individually (6 LP) - PHA-PMC3070

In addition, offers 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