

**Study Plan (AIMS)**  
Specialization: Data-Driven Biology



Name: \_\_\_\_\_

Year of Enrollment: \_\_\_\_\_

Matriculation Number: \_\_\_\_\_

Mentor: \_\_\_\_\_

| Winter Semester (1st Semester)                                                      |                                                     | approx. 30 CP                                                        |    |   |
|-------------------------------------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------------------------|----|---|
| <b>Foundations</b><br>1.-2. Semester<br><b>26 CP (total)</b>                        | Compulsory                                          | CP                                                                   |    |   |
|                                                                                     |                                                     | AM-P-1 Introduction to AIMS                                          | 5  | x |
|                                                                                     |                                                     | AM-P-2 Mathematics for Engineers A                                   | 8  | x |
|                                                                                     |                                                     | AM-P-3 Programming in Python and Python Lab                          | 8  | x |
| <b>Advanced Machine Learning and AI</b><br>1.-3. Semester<br><b>15 CP (total)</b>   | Elective                                            | AM-V-2 Pattern Recognition<br>(offered in German in winter semester) | 5  |   |
|                                                                                     |                                                     | AM-V-3 Computer Lab Pattern Recognition                              | 5  |   |
|                                                                                     |                                                     |                                                                      |    |   |
| <b>Specialization Data-Driven Biology</b><br>1.-3. Semester<br><b>37 CP (total)</b> | Compulsory Basic Module<br>choose 1 of 2<br>(10 CP) | AM-C-5 Systemsbiology: Modeling of Biochemical Networks              | 10 |   |
|                                                                                     |                                                     |                                                                      |    |   |
|                                                                                     | Elective (10-15 CP)                                 | AM-C-3 Applied Bioinformatics: Biomarkers for Diagnosis              | 10 |   |
|                                                                                     |                                                     | AM-C-10 Introduction to the Theoretical Physics of Life              | 10 |   |
|                                                                                     |                                                     | A) Sum of achieved CP for Specialization                             |    |   |
|                                                                                     |                                                     |                                                                      |    |   |
| <b>Key Qualifications</b><br>1.-3. Semester<br><b>12 CP (total)</b>                 | Compulsory                                          | AM-KQ-1 Ethics and Epistemology                                      | 5  | x |
|                                                                                     | Elective                                            | AM-KQ-2 Professionalization - Elective Modules                       | 7  |   |
|                                                                                     |                                                     |                                                                      |    |   |

| Summer Semester (2nd Semester)                                                      |                                                     | approx. 30 CP                                             |    |   |
|-------------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|----|---|
| <b>Foundations</b><br>1.-2. Semester<br><b>26 CP (total)</b>                        | Compulsory                                          | CP                                                        |    |   |
|                                                                                     |                                                     | AM-P-4 Scientific Software Engineering – Lab              | 5  | x |
| <b>Advanced Machine Learning and AI</b><br>1.-3. Semester<br><b>15 CP (total)</b>   | Elective                                            | AM-V-1 Machine Learning for Data Science                  | 5  |   |
|                                                                                     |                                                     | AM-V-2 Pattern Recognition                                | 5  |   |
|                                                                                     |                                                     | AM-V-3 Computer Lab Pattern Recognition                   | 5  |   |
|                                                                                     |                                                     | AM-V-4 Deep Learning Lab                                  | 5  |   |
|                                                                                     |                                                     | AM-V-5 Methods of Uncertainty Analysis and Quantification | 5  |   |
|                                                                                     |                                                     |                                                           |    |   |
| <b>Specialization Data-Driven Biology</b><br>1.-3. Semester<br><b>37 CP (total)</b> | Compulsory Basic Module<br>choose 1 of 2<br>(10 CP) | AM-C-1 Molecular Microbial Evolution and Diversity        | 10 | x |
|                                                                                     |                                                     |                                                           |    |   |
|                                                                                     | Elective (10-15 CP)                                 | AM-C-2 Immunometabolism                                   | 10 |   |
|                                                                                     |                                                     | AM-C-4 Network Biology                                    | 5  |   |
|                                                                                     |                                                     | AM-C-6 Biotechnological Aspects of Actinobacteria         | 5  |   |
|                                                                                     |                                                     | AM-C-8 Functional Genomics in Infection Biology           | 10 |   |
|                                                                                     |                                                     | AM-C-8 Functional Genomics in Infection Biology (light)   | 5  |   |
|                                                                                     |                                                     | AM-C-9 Microbial Proteomics                               | 10 |   |
|                                                                                     |                                                     | AM-C-9 Microbial Proteomics (light)                       | 5  |   |
|                                                                                     |                                                     | B) Sum of achieved CP for Specialization                  |    |   |
| <b>Key Qualifications</b><br>1.-3. Semester<br><b>12 CP (total)</b>                 | Elective                                            | AM-KQ-2 Professionalization - Elective Modules            | 7  |   |
|                                                                                     |                                                     |                                                           |    |   |

| Winter Semester (3rd Semester)                                                      |                       | approx. 30 CP                                                        |       |   |
|-------------------------------------------------------------------------------------|-----------------------|----------------------------------------------------------------------|-------|---|
| <b>Advanced Machine Learning and AI</b><br>1.-3. Semester<br><b>15 CP (total)</b>   | Elective              | CP                                                                   |       |   |
|                                                                                     |                       | AM-V-2 Pattern Recognition<br>(offered in German in winter semester) | 5     |   |
|                                                                                     |                       | AM-V-3 Computer Lab Pattern Recognition                              | 5     |   |
| <b>Specialization Data-Driven Biology</b><br>1.-3. Semester<br><b>37 CP (total)</b> | Elective (10-15 CP)   | AM-C-3 Applied Bioinformatics: Biomarkers for Diagnosis              | 10    |   |
|                                                                                     |                       | AM-C-10 Introduction to the Theoretical Physics of Life              | 10    |   |
|                                                                                     |                       | C) Sum of achieved CP for Specialization                             |       |   |
|                                                                                     | Compulsory (12-17 CP) | AM-C-RP Research Lab                                                 | 12-17 | x |
|                                                                                     |                       | 37 CP - (A + B + C) = CP Research Lab                                |       |   |
| <b>Key Qualifications</b><br>1.-3. Semester<br><b>12 CP (total)</b>                 | Compulsory            | AM-KQ-1 Ethics and Epistemology                                      | 5     | x |
|                                                                                     | Elective              | AM-KQ-2 Professionalization - Elective Modules                       | 7     |   |
|                                                                                     |                       |                                                                      |       |   |

| Summer Semester (4th Semester)                     |            | approx. 30 CP                         |    |   |
|----------------------------------------------------|------------|---------------------------------------|----|---|
| <b>Final Module</b><br>4. Semester<br><b>30 CP</b> | Compulsory | CP                                    |    |   |
|                                                    |            | AM-M Master's Thesis and Presentation | 30 | x |

**120 CP in total**

Date: \_\_\_\_\_ Signature Student: \_\_\_\_\_

Signature Mentor: \_\_\_\_\_