

# Study Plan (AIMS)

## Specialisation: Data-Driven Biology



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

Matricle Number: \_\_\_\_\_ Mentor: \_\_\_\_\_

| 1 <sup>st</sup> Semester (winter semester) |                                          |    | 30 CP |
|--------------------------------------------|------------------------------------------|----|-------|
|                                            |                                          | CP |       |
| Compulsory                                 | Introduction to AIMS                     | 5  | x     |
|                                            | Mathematics for Engineers A              | 8  | x     |
|                                            | Programming in Python and Python Lab     | 9  | x     |
| Compulsory Elective (10-15 CP)             | Metabolomic Biomarker Signatures         | 10 |       |
|                                            | A) Sum of achieved CP for Specialisation |    |       |
| Compulsory                                 | Ethics and Epistemology                  | 5  | x     |

|                                                                                        |
|----------------------------------------------------------------------------------------|
| <b>Foundations</b><br>1.-2. Semester<br>26 CP (total)                                  |
| <b>Specialisation</b><br><b>Data-Driven Biology</b><br>1.-3. Semester<br>37 CP (total) |
| <b>Key Qualifications</b><br>1.-3. Semester<br>12 CP (total)                           |

| 2 <sup>nd</sup> Semester (summer semester) |                                                    |    | 30 CP |
|--------------------------------------------|----------------------------------------------------|----|-------|
|                                            |                                                    | CP |       |
| Compulsory                                 | Scientific Software Engineering – Lab              | 5  | x     |
| Compulsory Elective                        | Machine Learning for Data Science                  | 5  |       |
|                                            | Pattern Recognition                                | 5  |       |
|                                            | Computer Lab Pattern Recognition                   | 5  |       |
|                                            | Deep Learning Lab                                  | 5  |       |
|                                            | Methods of Uncertainty Analysis and Quantification | 5  |       |
| Compulsory Basic Module (10 CP)            | Molecular Microbial Evolution and Diversity        | 10 | x     |
| Compulsory Elective (10-15 CP)             | Immunometabolism                                   | 10 |       |
|                                            | Network Biology                                    | 5  |       |
|                                            | Functional Genomics in Infection Biology           | 10 |       |
|                                            | Microbial Proteomics                               | 10 |       |
|                                            | B) Sum of achieved CP for Specialisation           |    |       |
| Compulsory Elective                        | Elective Modules                                   | 7  |       |

|                                                                                        |
|----------------------------------------------------------------------------------------|
| <b>Foundations</b><br>1.-2. Semester<br>26 CP (total)                                  |
| <b>Advanced Machine Learning and AI</b><br>2.-3. Semester<br>15 CP (total)             |
| <b>Specialisation</b><br><b>Data-Driven Biology</b><br>1.-3. Semester<br>37 CP (total) |
| <b>Key Qualifications</b><br>1.-3. Semester<br>12 CP (total)                           |

|                                                  |              |
|--------------------------------------------------|--------------|
| <b>3<sup>rd</sup> Semester (winter semester)</b> | <b>30 CP</b> |
|--------------------------------------------------|--------------|

|    |
|----|
| CP |
|----|

Compulsory Elective

*Pattern Recognition*

*(offered in German in winter term)*

5

Computer Lab Pattern Recognition

5

Compulsory Elective  
(10-15 CP)

Metabolomic Biomarker Signatures

10

C) Sum of achieved CP for Specialisation

37 CP - (A + B + C) = CP Research Lab (12-17 CP)

Research Lab

12-17

x

planned CP Research Lab

Compulsory Elective

Ethics and Epistemology

5

x

Elective Modules

7

**Advanced Machine Learning and AI**  
2.-3. Semester  
15 CP (total)

Specialisation  
**Data-Driven Biology**  
1.-3. Semester  
37 CP (total)

**Key Qualifications**  
1.-3. Semester  
12 CP (total)

|                                                  |              |
|--------------------------------------------------|--------------|
| <b>4<sup>th</sup> Semester (summer semester)</b> | <b>30 CP</b> |
|--------------------------------------------------|--------------|

|    |
|----|
| CP |
|----|

Compulsory

Master Thesis

30

x

**Master Thesis**  
4. Semester  
30 CP

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

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