

| M. Sc. AIMS (120 CP)                                                                   |                                                  | semester 1 (winter semester)                     |    | semester 2 (summer semester)                       |    | semester 3 (winter semester)                     |       | semester 4 (summer semester) |    |
|----------------------------------------------------------------------------------------|--------------------------------------------------|--------------------------------------------------|----|----------------------------------------------------|----|--------------------------------------------------|-------|------------------------------|----|
|                                                                                        |                                                  | module                                           | CP | module                                             | CP | module                                           | CP    | module                       | CP |
|                                                                                        |                                                  |                                                  |    |                                                    |    |                                                  |       |                              |    |
| Foundations<br>1.-2. semester<br><br>26 CP                                             | Compulsory                                       | Introduction to AIMS                             | 5  | Scientific Software Engineering – Lab              | 5  |                                                  |       |                              |    |
|                                                                                        |                                                  | Mathematics for Engineers A                      | 8  |                                                    |    |                                                  |       |                              |    |
|                                                                                        |                                                  | Programming in Python and Python Lab             | 8  |                                                    |    |                                                  |       |                              |    |
| Advanced Machine Learning<br>and AI<br>2.-3. semester<br><br>15 CP                     | Elective                                         |                                                  |    | Machine Learning for Data Science                  | 5  |                                                  |       |                              |    |
|                                                                                        |                                                  | Pattern Recognition [German]                     | 5  | Pattern Recognition                                | 5  | Pattern Recognition [German]                     | 5     |                              |    |
|                                                                                        |                                                  | Computer Lab Pattern Recognition                 | 5  | Computer Lab Pattern Recognition                   | 5  | Computer Lab Pattern Recognition                 | 5     |                              |    |
|                                                                                        |                                                  |                                                  |    | Deep Learning Lab                                  | 5  |                                                  |       |                              |    |
|                                                                                        |                                                  |                                                  |    | Methods of Uncertainty Analysis and Quantification | 5  |                                                  |       |                              |    |
| Specialization<br>Chemical Synthesis<br>and Drug Design<br>1.-3. semester<br><br>37 CP | Compulsory Basic Module 4 CP<br>(choose 1 of 2!) | Organometallic Chemistry                         | 4  | Reaction Mechanism                                 | 4  | Organometallic Chemistry                         | 4     |                              |    |
|                                                                                        | Elective<br>16 - 20 CP                           | Advanced Inorganic Chemistry                     | 8  | Catalysis                                          | 8  | Advanced Aspects in Inorganic Chemistry          | 8     |                              |    |
|                                                                                        |                                                  | Organic Synthesis Planning                       | 4  | Biomolecular Modelling                             | 8  | Organic Synthesis Planning                       | 4     |                              |    |
|                                                                                        |                                                  | Enzyme Engineering                               | 10 |                                                    |    | Enzyme Engineering                               | 10    |                              |    |
|                                                                                        |                                                  | Fundamentals of Protein Structure Analysis       | 10 |                                                    |    | Fundamentals of protein structure analysis       | 10    |                              |    |
|                                                                                        |                                                  | Advanced Theoretical Chemistry                   | 8  |                                                    |    | Advanced Theoretical Chemistry                   | 8     |                              |    |
|                                                                                        |                                                  | Machine Learning in Computational Chemistry      | 8  |                                                    |    | Machine Learning in Computational Chemistry      | 8     |                              |    |
|                                                                                        | Compulsory Research Lab<br>13 - 17 CP            |                                                  |    |                                                    |    | Research Lab                                     | 13-17 |                              |    |
| OR                                                                                     |                                                  |                                                  |    |                                                    |    |                                                  |       |                              |    |
| Specialization<br>Spectroscopy and<br>Imaging<br>1.-3. semester<br><br>37 CP           | Compulsory Basic Module 5 CP                     |                                                  |    | Molecular Spectroscopy                             | 5  |                                                  |       |                              |    |
|                                                                                        | Elective<br>16 - 20 CP                           | Biophysical Chemistry                            | 8  | Solar and chemical energy conversion               | 8  | Biophysical Chemistry                            | 8     |                              |    |
|                                                                                        |                                                  | Modern Optical Methods and Imaging               | 8  | Sophisticated Imaging                              | 10 | Modern Optical Methods and Imaging               | 8     |                              |    |
|                                                                                        |                                                  | Physical Biology of the Cell                     | 10 |                                                    |    | Physical Biology of the Cell                     | 10    |                              |    |
|                                                                                        |                                                  | Chemometrics                                     | 5  |                                                    |    | Chemometrics                                     | 5     |                              |    |
|                                                                                        |                                                  | Theoretical Spectroscopy                         | 8  |                                                    |    | Theoretical Spectroscopy                         | 8     |                              |    |
|                                                                                        |                                                  | Machine Learning in Computational Chemistry      | 8  |                                                    |    | Machine Learning in Computational Chemistry      | 8     |                              |    |
|                                                                                        | Compulsory Research Lab<br>12 - 16 CP            |                                                  |    |                                                    |    | Research Lab                                     | 12-16 |                              |    |
| OR                                                                                     |                                                  |                                                  |    |                                                    |    |                                                  |       |                              |    |
| Specialization<br>Data-Driven Biology<br>1.-3. semester<br><br>37 CP                   | Compulsory Basic Module 10 CP                    |                                                  |    | Molecular Microbial Evolution and Diversity        | 10 |                                                  |       |                              |    |
|                                                                                        | Elective<br>10 - 15 CP                           | Applied Bioinformatics: Biomarkers for Diagnosis | 10 | Immunometabolism                                   | 10 | Applied Bioinformatics: Biomarkers for Diagnosis | 10    |                              |    |
|                                                                                        |                                                  |                                                  |    | Network Biology                                    | 5  |                                                  |       |                              |    |
|                                                                                        |                                                  |                                                  |    | Functional Genomics in Infection Biology           | 10 |                                                  |       |                              |    |
|                                                                                        |                                                  |                                                  |    | Microbial Proteomics                               | 10 |                                                  |       |                              |    |
|                                                                                        | Compulsory Research Lab<br>12 - 17 CP            |                                                  |    |                                                    |    | Research Lab                                     | 12-17 |                              |    |
| Key Qualifications<br>1.-3. semester<br><br>12 CP                                      | Compulsory 5 CP                                  | Ethics and Epistemology                          | 5  |                                                    |    | Ethics and Epistemology                          | 5     |                              |    |
|                                                                                        | Elective 7 CP                                    | Elective Modules                                 | 7  | Elective Modules                                   | 7  | Elective Modules                                 | 7     |                              |    |
|                                                                                        |                                                  |                                                  |    |                                                    |    |                                                  |       |                              |    |
| Master Thesis<br>4. semester<br>30 CP                                                  | Compulsory                                       |                                                  |    |                                                    |    |                                                  |       | Master Thesis in AIMS        | 30 |