

| Curriculum Physics M.Sc.                                                         |       |    |     | Particle Physics              |                                     |                                         |                                    | Condensed Matter Physics              |                 |                    |                         |
|----------------------------------------------------------------------------------|-------|----|-----|-------------------------------|-------------------------------------|-----------------------------------------|------------------------------------|---------------------------------------|-----------------|--------------------|-------------------------|
|                                                                                  |       |    |     | Experimental Particle Physics | Astroparticle Physics and Cosmology | Quantum Field Theory and Gauge Theories | Artificial Intelligence in Physics | Experimental Condensed Matter Physics | Nanoelectronics | Quantum Technology | Condensed Matter Theory |
|                                                                                  |       |    | SWS | CP                            |                                     |                                         |                                    |                                       |                 |                    |                         |
| 1st Semester                                                                     |       |    |     |                               |                                     |                                         |                                    |                                       |                 |                    |                         |
| Particle Physics I                                                               | V4 Ü2 | 10 | 10  | 10                            |                                     | 10                                      |                                    |                                       |                 |                    |                         |
| Quantum Field Theory of Particle Physics I                                       | V4 Ü2 | 10 |     |                               | 10                                  |                                         |                                    |                                       |                 |                    |                         |
| Theory of Relativity and Cosmology                                               | V4 Ü2 | 10 |     |                               | 10                                  |                                         | 10                                 |                                       |                 |                    |                         |
| Condensed Matter Physics I                                                       | V4 Ü2 | 10 |     |                               |                                     |                                         |                                    | 10                                    | 10              | 10                 |                         |
| Theoretical Solid State Physics                                                  | V4 Ü2 | 10 |     |                               |                                     |                                         |                                    |                                       |                 |                    | 10                      |
| Quantum Theory of Condensed Matter I                                             | V4 Ü2 | 10 |     |                               |                                     |                                         |                                    |                                       |                 |                    | 10                      |
| Introduction to Machine Learning and Deep Learning                               | V2 Ü1 | 5  |     |                               |                                     | 5                                       |                                    |                                       |                 |                    |                         |
| Deep Learning in Physics Research                                                | V2 Ü1 | 5  |     |                               |                                     | 5                                       |                                    |                                       |                 |                    |                         |
| Novel Materials and Devices for Information Technology 1                         | V2 Ü1 | 5  |     |                               |                                     |                                         |                                    | 5                                     |                 |                    |                         |
| Hardware Platforms for Quantum Technology                                        | V2 Ü1 | 5  |     |                               |                                     |                                         |                                    |                                       | 5               |                    |                         |
| Elective Courses<br>(from courses above or specialization or subsidiary courses) |       |    | 20  | 10                            | 10                                  | 10                                      | 20                                 | 15                                    | 15              | 10                 |                         |
|                                                                                  |       |    |     | 30                            | 30                                  | 30                                      | 30                                 | 30                                    | 30              | 30                 |                         |
| 2nd semester                                                                     |       |    |     |                               |                                     |                                         |                                    |                                       |                 |                    |                         |
| Particle Physics II                                                              | V4 Ü2 | 10 | 10  |                               |                                     |                                         |                                    |                                       |                 |                    |                         |
| Quantum Field Theory of Particle Physics II                                      | V4 Ü2 | 10 |     |                               | 10                                  |                                         |                                    |                                       |                 |                    |                         |
| Astroparticle Physics                                                            | V4 Ü2 | 10 |     | 10                            |                                     |                                         |                                    |                                       |                 |                    |                         |
| Laboratory Course Particle Physics                                               | V1 P8 | 10 | 10  |                               |                                     |                                         |                                    |                                       |                 |                    |                         |
| Theory of Deep Learning                                                          | V2 Ü1 | 5  |     |                               |                                     | 5                                       |                                    |                                       |                 |                    |                         |
| Project Seminar Deep Learning in Physics Research                                | S2    | 5  |     |                               |                                     | 5                                       |                                    |                                       |                 |                    |                         |
| Condensed Matter Physics II                                                      | V4 Ü2 | 10 |     |                               |                                     |                                         | 10                                 |                                       |                 |                    |                         |
| Laboratory Course Solid State Physics                                            | V2 P8 | 10 |     |                               |                                     |                                         | 10                                 |                                       |                 |                    |                         |
| Laboratory Course Nanoelectronics                                                | V2 P8 | 10 |     |                               |                                     |                                         |                                    | 10                                    |                 |                    |                         |
| Laboratory Course Quantum Technology                                             | V1 P4 | 5  |     |                               |                                     |                                         |                                    |                                       | 5               |                    |                         |
| Quantum Theory of Condensed Matter II                                            | V4 Ü2 | 10 |     |                               |                                     |                                         |                                    |                                       |                 | 10                 |                         |
| Computational Physics                                                            | V4 Ü2 | 10 |     |                               |                                     |                                         |                                    |                                       |                 |                    |                         |
| Quantum Information                                                              | V4 Ü2 | 10 |     |                               |                                     |                                         |                                    |                                       | 10              |                    |                         |
| Statistical Physics                                                              | V4 Ü2 | 10 |     |                               |                                     |                                         |                                    |                                       |                 |                    |                         |
| Novel Materials and Devices for Information Technology 2                         | V2 Ü1 | 5  |     |                               |                                     |                                         |                                    | 5                                     |                 |                    |                         |
| Elective Courses<br>(from courses above or specialisation or subsidiary courses) |       |    | 10  | 20                            | 20                                  | 20                                      | 10                                 | 15                                    | 15              | 20                 |                         |
|                                                                                  |       |    |     | 30                            | 30                                  | 30                                      | 30                                 | 30                                    | 30              | 30                 |                         |
| 3rd semester                                                                     |       |    |     |                               |                                     |                                         |                                    |                                       |                 |                    |                         |
| Master's Seminar                                                                 |       | 15 | 15  | 15                            | 15                                  | 15                                      | 15                                 | 15                                    | 15              | 15                 |                         |
| Master's Practical                                                               |       | 15 | 15  | 15                            | 15                                  | 15                                      | 15                                 | 15                                    | 15              | 15                 |                         |
|                                                                                  |       |    |     | 30                            | 30                                  | 30                                      | 30                                 | 30                                    | 30              | 30                 |                         |
| 4th semester                                                                     |       |    |     |                               |                                     |                                         |                                    |                                       |                 |                    |                         |
| Master's Thesis                                                                  |       | 25 | 25  | 25                            | 25                                  | 25                                      | 25                                 | 25                                    | 25              | 25                 |                         |
| Master's Defence Colloquium                                                      |       | 5  | 5   | 5                             | 5                                   | 5                                       | 5                                  | 5                                     | 5               | 5                  |                         |
|                                                                                  |       |    |     | 30                            | 30                                  | 30                                      | 30                                 | 30                                    | 30              | 30                 |                         |
|                                                                                  |       |    |     |                               |                                     |                                         |                                    |                                       |                 |                    |                         |
| Total                                                                            |       |    | 120 | 120                           | 120                                 | 120                                     | 120                                | 120                                   | 120             | 120                |                         |