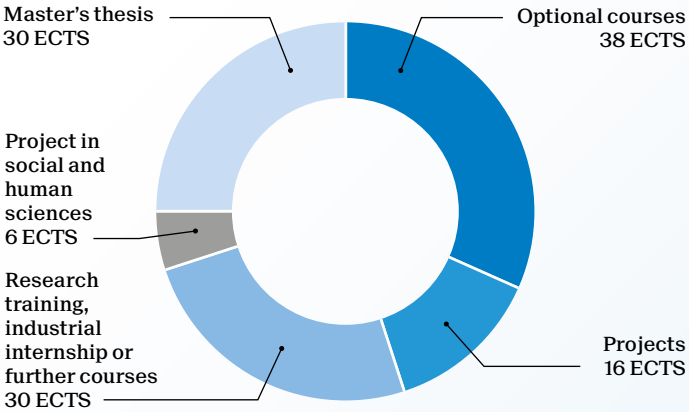
Master of Science in

PHYSICS AND APPLIED PHYSICS

2-year program - 120 ECTS



Research training, industrial internship or further courses

Students pursuing a Physics degree must complete a research training semester whereas students enrolled in an Applied Physics curriculum must undertake a 4 to 6-month internship in industry. All students may instead choose to follow further courses to deepen their knowledge in preferred domains (30 ECTS, included in the 120 ECTS). In this case, students enrolled in the Applied Physics Master's degree must complete their Master's thesis in industry (6 months).

Optional courses

Students following the Master in Physics choose:
- at least 20 ECTS in list A
- at most 18 ECTS can be chosen among an approved list of options in other programs

Students following the Master in Applied Physics choose:
- at least 19 ECTS in list B - Engineering
- at most 19 ECTS in list C - Physics

Minor

Instead of the research training semester, the internship in industry or the further courses, students may choose a 30 ECTS minor included in the 120 ECTS. In this case, students enrolled in the Applied Physics Master's degree must complete their Master's thesis in industry. Recommended minors with this program:
- Engineering for sustainability
- Photonics
- Physics of living systems
- Quantum science and engineering
- Space technologies

School of Basic Sciences
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				Credits
Optional courses	**A**	**B**	**C**	**38**
Astrophysics II: interaction of radiation with matter	A		C	4
Astrophysics III: galaxy formation and evolution	A		C	4
Astrophysics IV: stellar and galactic dynamics	A		C	4
Astrophysics V: observational cosmology	A		C	4
Attosecond radiation sources	A	B		4
Biophysics: physics of biological systems	A		C	4
Computational quantum physics	A	B		4
Computer simulation of physical systems	A	B		4
Electron microscopy: advanced methods	A	B		3
Experimental methods in physics	A	B		3
Frontiers in nanosciences	A	B		3
Fundamentals of biomedical imaging	A	B		4
Interacting quantum matter	A		C	4
Introduction to astroparticle physics	A		C	4
Introduction to particle accelerators	A	B		4
Lasers: theory and modern applications	A	B		4
Machine learning for physicists	A	B		6
Magnetism in materials	A		C	4
Mathematical aspects of quantum physics	A		C	4
Microwave engineering in physics	A	B		4
Modeling and design of experiments	A	B		4
MRI practicals on CIBM preclinical imaging systems	A	B		3
Neutron and X-ray scattering of quantum materials	A		C	4
Nonlinear dynamics, chaos and complex systems	A	B		6
Nonlinear optics for quantum technologies	A	B		4
Nuclear fusion and plasma physics	A	B		4
Nuclear interaction: from reactors to stars	A	B		4
Particle detection	A	B		4
Particle physics: the flavour frontiers	A		C	4
Particle physics I	A		C	4
Particle physics II	A		C	4
Physics of life	A	B		4
Physics of materials	A	B		4
Physics of photonic semiconductor devices	A	B		4
Plasma I	A		C	6
Plasma II	A	B		6
Quantum electrodynamics and quantum optics	A		C	6
Quantum field theory I	A		C	6
Quantum field theory II	A		C	6
Quantum computing	A		C	6
Quantum information theory	A		C	4
Quantum optics and quantum information	A	B		6
Quantum physics III	A		C	6
Quantum physics IV	A		C	6
Quantum transport in mesoscopic systems	A	B		4
Radiation biology, protection and applications	A	B		4
Radiation detection	A	B		3
Relativity and cosmology I	A		C	6
Relativity and cosmology II	A		C	6
Selected topics in nuclear and particle physics	A	B		4
Semiconductor physics and light-matter interaction	A	B		4
Solid state physics III	A		C	6
Solid state physics IV	A		C	4
Solid state systems for quantum information	A	B		4
Spintronics: basics and applications	A	B		4
Statistical physics III	A		C	6
Statistical physics IV	A		C	6
Statistical physics of biomacromolecules	A		C	4
Statistical physics of computation	A		C	4
Topics in biophysics and physical biology	A	B		3

Two projects in the following fields:	**16**
Astrophysics, particles, high energy physics	
Condensed matter physics	
Physics of biological and complex systems	
Plasma physics and energy	
Quantum science and technology	