Faculty of Science

NAFYK, Master Programme in Physics, 120 credits

Masterprogram i fysik, 120 högskolepoäng

Second-cycle programme requiring previous university studies / Program med akademiska förkunskapskrav och med slutlig examen på avancerad nivå

Decision

The syllabus was approved by Study programmes board, Faculty of Science on 2007-10-24 (N 2007-48) and was last revised on 2026-05-28 by The Education Board of Faculty of Science (U 2026/337). The revised syllabus comes into effect 2026-10-15 and is valid from the autumn semester 2027.

Specialisations

Code	Swedish name	English name	Credits
BIFY	Biological Physics and Computational Biology	Biologisk fysik och beräkningsbiologi	120 credits
EXPK	Experimental Particle and Nuclear Physics	Experimentell partikel- och kärnfysik	120 credits
ALLM	General	Allmän inriktning	120 credits
MAVE	Materials science	Materialvetenskap	120 credits
KVAN	Quantum Science and Technology	Kvantinformation och kvantvetenskap	120 credits
TEFY	Theoretical Physics	Teoretisk fysik	120 credits
XRAY	X-ray and Neutron Science	Röntgen- och neutronvetenskap	120 credits

Programme description

The programme for a degree of Master of Science specialising in Physics comprises 120 credits and leads to a degree of Master of Science (120 credits) with a major in Physics.

The programme is based on scholarship and is closely linked to research conducted at the Lund University Faculty of Science. The operations at the faculty uphold academic credibility and good research practice and are arranged to ensure that high standards are attained in courses and study programmes. Furthermore, the operations promote sustainable development, equality between women and men and understanding of other countries and international circumstances. These aspects are integrated in the

degree outcomes of the programme.

Second-cycle courses and study programmes in the main field of Physics are fundamentally based on the knowledge acquired by students during first-cycle courses and study programmes.

Second-cycle courses and study programmes in the main field of Physics involve the acquisition of specialist knowledge, competence and skills in relation to first-cycle courses and study programmes, and in addition to the requirements for first-cycle courses and study programmes shall:

- further develop the ability of students to integrate and make autonomous use of their knowledge,
- develop the students' ability to deal with complex phenomena, issues and situations, and
- develop the students' potential for professional activities that demand considerable autonomy, or for research and development work.

The programme applies a learning perspective, in which students take an active role in the learning process, and consciously and continuously reflect on their learning and development towards the degree outcomes.

The appendix Achievement of learning outcomes for a degree of Master of Science with a major in Physics at the Faculty of Science describes the disciplinary foundation and links to research of the programme.

Goals

Knowledge and understanding

For a Degree of Master (120 credits) the student shall:

- demonstrate knowledge and understanding in the main field of study, including both broad knowledge of the field and a considerable degree of specialised knowledge in certain areas of the field as well as insight into current research and development work, and
- demonstrate specialised methodological knowledge in the main field of study.

Competence and skills

For a Degree of Master (120 credits) the student shall:

- demonstrate the ability to critically and systematically integrate knowledge and analyse, assess and deal with complex phenomena, issues and situations even with limited information
- demonstrate the ability to identify and formulate issues critically, autonomously and creatively as well as to plan and, using appropriate methods, undertake advanced tasks within predetermined time frames and so contribute to the formation of knowledge as well as the ability to evaluate this work

- demonstrate the ability in speech and writing both nationally and internationally to clearly report and discuss his or her conclusions and the knowledge and arguments on which they are based in dialogue with different audiences, and
- demonstrate the skills required for participation in research and development work or autonomous employment in some other qualified capacity.

Judgement and approach

For a Degree of Master (120 credits) the student shall:

- demonstrate the ability to make assessments in the main field of study informed by relevant disciplinary, social and ethical issues and also to demonstrate awareness of ethical aspects of research and development work
- demonstrate insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used, and
- demonstrate the ability to identify the personal need for further knowledge and take responsibility for his or her ongoing learning.

Independent project (degree project)
A requirement for the award of a degree of Master (120 credits) is completion by the student of an independent project (degree project) for at least 30 credits in the main field of study. The degree project may comprise less than 30 credits, however no less than 15 credits, if the student has already completed an independent project in the second cycle for at least 15 credits in the main field of study or the equivalent from a programme of study outside Sweden.

Course information

The programme comprises 2 years for a degree of Master (120 credits). The appendix 1 Programme Structure and course requirements for Master Programme in Physics, 120 credits at the Faculty of Science describes the courses included.

A Degree of Master (120 credits) is awarded after the student has completed the courses required. In addition, the prior award of a Degree of Bachelor of at least 180 credits or a corresponding qualification from abroad is required. To acquire the fundamentally based advanced knowledge and understanding, competence and skills as well as judgement and approach required to meet the learning outcomes for a degree of Master of Science (120 credits) with a major in Physics, new knowledge building upon the underlying Bachelor's degree is necessary.

See attatchment NAFYK - Programme Structure and course requirements for Master Programme in Physics, 120 credits.pdf

Degree

Degree titles

Degree of Master of Science (120 credits)
Main field of study: Physics

Entry requirements and selection method

Entry requirements

Bachelor's degree of at least 180 credits in physics or the equivalent. The degree must include at least 90 credits in physics.

Proficiency in English equivalent to English 6/B from Swedish upper-secondary school.

Selection method

Based on grades awarded for previous academic courses, particularly qualifying courses, and a statement of purpose for the application (from the applicant's "Summary sheet").

Transition rules

The Faculty Board may decide on the discontinuation of a programme or main field and may also decide, in association with this, on transitional provisions for students who have started these programmes.

Other information

Rules pertaining to grades and examination are stated in the course syllabi approved by the Faculty Board.

LUND UNIVERSITY

FACULTY OF SCIENCE

Department of Physics

Appendix 1 for programme syllabus, NAFYK Master Programme in Physics, 120 credits

Reg. No.
U 2026/337

Date 2026-05-28

Programme Structure and course requirements for Master Programme in Physics, 120 credits

The programme comprises two years of full-time studies (120 credits) and leads to a degree of Master of Science with a major in Physics, and can be pursued through several specialisations, each with its associated study path.

Specialisations

- General
- Materials science
- Experimental Particle and Nuclear Physics
- X-ray and Neutron Science
- Theoretical Physics
- Quantum Science and Technology

Mandatory courses for all specialisations

Mandatory courses of 15 credits.

FYSN20, Physics: Communicating Physics, 7.5 credits
FYSN27, Physics: Quantum Mechanics, 7.5 credits

Alternative - Mandatory courses

Alternative – Mandatory (elective) courses of 22.5 credits within each specialisation.

General

For the specialisation in General Physics, a minimum of 22.5 credits from the following courses:

FYSN23, Physics: Advanced Electromagnetism, 7.5 credits
FYTN15, Theoretical Physics: Statistical Mechanics, 7.5 credits
FYSN33, Physics: Applied Computational Physics and Machine Learning, 7.5 credits
FYST65, Physics: Spectroscopy and the Quantum Description of Matter, 7.5 credits
FYSN28, Physics: General Relativity, 7.5 credits
FYSN35, Physics: Electronics for Physicists, 7.5 credits
FYST89, Physics: Advanced Quantum Mechanics, 7.5 credits

Material science

For the specialisation in Material science, a minimum of 22.5 credits from the following courses:

FYST64, Physics: Physics and Chemistry of Surfaces, 7.5 credits
FYST65, Physics: Spectroscopy and the Quantum Description of Matter, 7.5 credits
FYST42, Physics: Scanning Probe Microscopy, 7.5 credits
FYST51, Physics: Modern X-ray Physics - Diffraction and Imaging, 7.5 credits
FYTN15, Theoretical Physics: Statistical Mechanics, 7.5 credits

Experimental Particle and Nuclear Physics

For the specialisation in Experimental Particle and Nuclear Physics, a minimum of 22.5 credits from the following courses:

FYSN35, Physics: Electronics for Physicists, 7.5 credits
FYST62, Physics: Modern Experimental Particle Physics, 7.5 credits
FYST98, Physics: Modern Subatomic Physics, 7.5 credits
FYTN18, Theoretical Physics: Theoretical Particle Physics, 7.5 credits
FYST54, Physics: Advanced Nuclear Physics, 7.5 credits
FYST95, Physics: Theoretical Nuclear Physics, 7.5 credits

X-ray and Neutron Science

For the specialisation in X-ray and Neutron Science, a minimum of 22.5 credits from the following courses:

MAXM25, Accelerators and Free Electron Lasers, 7.5 credits
MAXM26, Experimental Methods and Instrumentation for Synchrotron Radiation Research, 7.5 credits
FYST52, Physics: Modern Neutron Science, 7.5 credits
FYST65, Physics: Spectroscopy and the Quantum Description of Matter, 7.5 credits
FYST51, Physics: Modern X-ray Physics - Diffraction and Imaging, 7.5 credits

Theoretical Physics

For the specialisation in Theoretical Physics, a minimum of 22.5 credits from the following courses:

FYSN31, Physics: Mathematical Methods of Physics, 7.5 credits
FYSN33, Physics: Applied Computational Physics and Machine Learning, 7.5 credits
FYTN15, Theoretical Physics: Statistical Mechanics, 7.5 credits
FYSN23, Physics: Advanced Electromagnetism, 7.5 credits
FYSN28, Physics: General Relativity, 7.5 credits
FYST89, Physics: Advanced Quantum Mechanics, 7.5 credits
FYTN18, Theoretical Physics: Theoretical Particle Physics, 7.5 credits
FYTN19, Theoretical Physics: Introduction to Quantum Field Theory, 7.5 credits

Quantum Science and Technology

For the specialisation in Quantum Science and Technology, a minimum of 22.5 credits from the following courses:

FYST85, Quantum Computation, 7.5 credits
FYST83, Quantum Optics, 7.5 credits
FYST82, Quantum Information Theory, 7.5 credits
FYST84, Superconductivity, 7.5 credits
FYST86, Light-Matter Interaction, 7.5 credits
FYST01, Lasers, 7.5 credits
FYST79, The Physics of Low-dimensional Structures and Quantum, 7.5 credits

Optional courses

Optional courses between 22.5 to 52.5 credits within each specialisation.

Degree Project

Degree project of 30 to 60 credits.

FYSM34, Physics: Master's Degree Project, 30 credits
or
FYSM64, Physics: Master's Degree Project III, 60 credits