

NSNP

The Master's degree in Physics aims at forming students with specific advanced skills in different areas of modern physics, based on a solid interdisciplinary scientific background.

Graduates in Physics are appreciated for their open-minded, multi-disciplinary approach and their ability to apply scientific method to the analysis and resolution of complex problems, in various fields of physics as well as in other science-related sectors.

Graduates will be able to continue their education in Professional Masters' Programmes and/or Doctoral Schools worldwide, and career opportunities in Italian and foreign public agencies or private companies in the field of:

- Research and development
- Applications and technological innovation
- Scientific outreach and teaching

More specifically, at the end of the course, students in the Nuclear and Subnuclear Physics curriculum will:

- have fundamental and conceptual knowledge of nuclear physics and elementary particle physics;
- have advanced skills for the in-depth understanding of phenomena related to state-of-the-art experimental research fields;
- be able to discuss the applications of nuclear and subnuclear physics in modern society.

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MASTER'S DEGREE IN PHYSICS

Curriculum: NUCLEAR AND SUBNUCLEAR PHYSICS

SECOND CYCLE DEGREE PROGRAMME/MASTER
UNIVERSITY OF BOLOGNA

Web-page:

<https://corsi.unibo.it/2cycle/Physics>

PROGRAMME DIRECTOR:

Prof. Nico Lanconelli

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CONTACTS FOR THE CURRICULUM IN
NUCLEAR AND SUBNUCLEAR PHYSICS:

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TUITION FEE: about € 3,000.00 / year

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ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA
SCHOOL OF SCIENCE

SCHOOL OF SCIENCE

PHYSICS
CURRICULUM
IN NUCLEAR
AND SUB
NUCLEAR
PHYSICS

SECOND CYCLE
DEGREE
PROGRAMME/
MASTER
BOLOGNA

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COURSE STRUCTURE DA AGG.

I year	ECTS
Compulsory Classes	18
Introduction to Particle Physics	6
Laboratory of Nuclear and Subnuclear Physics	6
Nuclear Physics	6
Elective Classes in Nuclear and Subnuclear Physics	24
Astroparticle Physics	6
Laboratory of Nuclear and Subnuclear Physics 2	6
Software and Computing for Nuclear and Subnuclear Physics	6
Statistical Data Analysis for Nuclear and Subnuclear Physics	6
Subnuclear Physics	6
Elective Classes in other related fields of Physics	12
Quantum Field Theory 1	6
Physics Education	6
Theory of the Standard Model	6
General Relativity 1	6
Symmetries, Electrons and Photons	6
Semiconductor Materials and Nanostructures	6
Laboratorio di Didattica della Fisica	6
II year	ECTS
Elective Classes in Nuclear and Subnuclear Physics	6
Accelerators and Plasma Physics	6
Advanced Detectors for High Energy Physics	6
Applied Electronics	6
Applications of Nuclear Physics	6
Flavour Physics	6
Laboratory of Data Acquisition and Data Processing	6
Phenomenology of the Standard Model	6
Elective classes from any course of Master in Physics	12
Transversal Skills for Physics-related Professions	6
Advanced Professional and Research Skills in Physics	6
Final Dissertation (inclusive of stage and/or periods abroad)	36

Learning Outcomes

During the first year of the programme, students acquire solid knowledge in nuclear and subnuclear physics, with particular emphasis on experimental aspects. The programme also includes course units covering the basic principles of theoretical physics.

Depending on the chosen ECTS, students develop advanced skills in R&D, electronics, computing or statistical techniques. During the second year of the programme, students extend their knowledge in specific course units on advanced topics, and also develop cross-cutting skills in project writing, innovation, scientific communication and outreach.

At the end of the course, students shall produce and orally defend an original research project, developed within a research group of the Department, possibly in collaboration with other public science agencies or private companies in Italy or abroad.

Career Opportunities

2nd cycle degree graduates can apply for Professional Masters' Programmes as well as PhD Programmes in Italian and foreign universities. Career opportunities for graduates also lie in Research and Development Units within public science agencies and private companies.

Entry Requirements

Admission to the 2nd cycle degree programme in Physics is open to candidates with:

- a First Cycle Degree obtained in Italy or equivalent qualification obtained abroad, in one of the following classes:
 - degree programme in class L-30 (pursuant to DM 270/2004) Physics Sciences and Technology;
 - degree programme in class XXV Physics Sciences and Technology (pursuant to DM 509/99);
 - 4-year degree programme in Physics and in Astronomy from the previous degree programme system
- knowledge of English to level B2.

To profitably attend the Programme, students must possess fundamental skills in mathematics and a good understanding of the phenomenology and models of classical and modern physics, including the fundamentals of micro-physics applied to particle physics and condensed matter. They should also have laboratory experience including the use of basic instruments and data acquisition and processing, using computer-assisted techniques.

Admission is subject to the assessment of the candidate's personal knowledge based on the student's curriculum and/or an interview, according to the rules set by the Degree Programme Board and published on the web-page.