

Physics

Master Degree

Second Cycle Degree

Duration 2 years

ECTS credits 120

Campus Location Camerino

School of Science and Technology Physics Division

via Madonna delle Carceri 9

web site

www.phys.unicam.it

Director

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Delegates

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International Mobility

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Stage & Placement (Internship)

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INTRODUCING THE MASTER

The Master Degree Course in Physics offerings range from freshman seminars to advanced graduate classes.

Undergraduates, graduate students and postdoctoral fellows are mentored and engaged in advanced research in condensed matter, atomic physics, quantum optics, as well as quantum information, astrophysics and nuclear physics.

Our strong international programs enjoy several established connections with foreign institutions and research centres.

The master benefits of a longstanding and well appreciated didactical expertise, a friendly and skilful teaching staff, and reliable supporting structures (such as study and work rooms, laboratories, computer facilities, libraries) in addition to dedicated tutorship services.

After completing the degree, students seeking further training and education can choose a Professional Master course (typically lasting one year), a Specialization School (for example, the School of Specialization in Health Physics of four year duration), or a Doctoral course. The School of Advanced Studies at the University of Camerino offers a three-year Doctoral course in Physics, enabling students to start a research activity at the international level.

ADMITTANCE REQUIREMENTS

- Bachelor Degree that satisfies the requirements for access to University Master Degree courses
- List of studied subjects:
 - Classical physics;
 - Quantum physics;
 - Calculus;
 - Geometry and linear algebra;
 - Basic experimental techniques;
 - Use of basic computing systems and their application to data acquisition and processing.
- English language proficiency level:
B1, accordingly to CEFR (Common European Framework of Reference for Languages)

Further information on admission rules, pre-admission deadline and other services at <http://international.unicam.it>

CAREER OPPORTUNITIES

A Master Degree in Physics opens up a broad range of job opportunities and professional careers, in both the public and private sectors: from higher education to R&D in industry and research institutions, and even in the financial markets. Physicists carry out technical tasks or provide professional support in monitoring and diagnostics of medical, health and environmental activities, in energy production, storing, and saving, or in the conservation and restoration of cultural heritage. They take part in quality control, by identifying and selecting the items to be checked, devising the control methods and their range of tolerance. Physicists are also employed as financial analysts and consultants.

Classes will be held face to face in the University halls but it is possible to attend them also in streaming. Practical activities and laboratories will be organized in different modalities that will be communicated in due time.



COURSE STRUCTURE

There are two Semesters, from October to the end of January, and from March to mid-June. The Winter Exam Session is in February. The student can choose between the following 5 different paths (to be communicated when registering):

- **Astroparticle & nuclear physics**
(contact prof. S. Simonucci, email stefano.simonucci@unicam.it)
- **Condensed matter & nanoscience**
(contact prof. A. Di Cicco, email andrea.dicicco@unicam.it)
- **Materials, energy & environment**
(contact prof. R. Gunnella, email roberto.gunnella@unicam.it)
- **Quantum technologies**
(contact prof. D. Vitali, email david.vitali@unicam.it)
- **Theoretical physics & complex systems**
(contact prof. F. Marchesoni, email fabio.marchesoni@unicam.it)

The courses characterizing each path are reported in the following table:

MSc-PHYSICS						
Majors		Astroparticle & nuclear physics	Condensed matter & nanoscience	Materials, energy & environment	Quantum technologies	Theoretical physics & complex systems
Common activities	30 CFU	Advanced electromagnetism				
		Advanced physics laboratory				
		Machine learning				
		Solid state physics				
		Theoretical Physics				
Characterizing activities	30 CFU	Advanced nuclear physics	Advanced spectroscopy	Experimental material science	Atomic physics	Advanced probability and stochastic processes
		Astro & particle physics	Condensed matter theory	Fundamental of material sciences	Physics of nanotechnologies	Biological physics
		Cosmology	Experimental nanoscience	Physics of nanotechnologies	Quantum computation	Quantum field theory
		Laboratory of astroparticle	Physics of nanotechnologies	Surface and chemical physics	Quantum optics	Quantum information
		Quantum field theory	Statistical mechanics	Synthesis of functional materials	Statistical mechanics	Statistical mechanics
Free choice activities	To choose 12 CFU out of the 24 proposed	Artificial intelligence laboratory	Quantum field theory	Advanced spectroscopy	Artificial intelligence laboratory	Advanced mathematical physics
		General relativity	Quantum optics	Energy production & storage	Experimental nanoscience	Artificial intelligence laboratory
		Quantum information	Surface and chemical physics	Environmental remediation	Quantum information	Dynamic & stochastic optimization
		Statistical mechanics	Synthesis of functional materials	Statistical mechanics	Biological physics	Quantum computation
Stage	6 CFU					
Thesis	42 CFU					

- Students can spend up to 6 months (outside the Erasmus program) in other foreign institutions or universities for the realization of internships and / or theses.
- Individual study plans can also be proposed for approval by a faculty committee.
- Since 2019 Unicam students can take up four courses of the master's in physics program at Università Statale di Milano without additional fees.
- Quantum information and Quantum computation courses will be taught in alternate years.

More information

<https://www.unicam.it/didattica/guida-dello-studente>

<https://www.unicam.it/international-student>

a.y. 2022/2023

