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.

Classes are held in English.
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:

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

- 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