



**UNIMORE**

UNIVERSITÀ DEGLI STUDI DI  
MODENA E REGGIO EMILIA

# Department of Physics, Informatics and Mathematics

**Master's Degree Programme in Physics**





# Master's Degree Pro

**Department of Physics,  
Informatics and Mathematics  
Modena Campus**

**2 years, full time**  
ECTS credits: **120**

Programme start: **September 2020**

## Teaching Programme

### 1° year

10 mandatory and elective teaching modules (6 ECTS each) depending on the curriculum

### 2° year

1 elective teaching module (6 ECTS) depending on the curriculum

Free choice courses (12 ECTS)

Professional preparation (6 ECTS)

Research project and dissertation (36 ECTS)

### Teaching modules

Spintronics and quantum technologies, Monte Carlo Methods in Physics, Quantum Information Processing, Fundamentals of Nanosciences, Biological Physics with laboratory, Chemical Physics of Biomolecules, Medical physics, Numerical Algorithm for Signal and Image Processing, Machine Learning and Deep Learning, Computational topology, Advanced Quantum Mechanics, Quantum Field Theory, Statistical Mechanics and Phase Transitions, Quantum Physics of Matter, Quantum Many-Body Theory, Laboratory of Condensed Matter Physics, Laboratory of Nanofabrication, Physics of Semiconductors, Advanced Photonics, Physics Education: Theoretical and Experimental Methods, Nano-mechanics, Advanced Quantum Field Theory, Relativity, Laboratory of Quantum Simulation for Materials, Elementary Particles, Synchrotron Radiation: basics and applications, Good Practices and Research Integrity in Sciences, Science-based innovation, High-Performance-Computing for sciences.

## Presentation

The M. Sc. in Physics is an English taught international program that allows students to specialize in different areas of contemporary physics, from the physics of matter to fundamental interactions, and ensuing technological applications. Our teaching staff involves leading scientists of the Department as well as visiting professors from renowned universities abroad. All along the program, students are in close contact with the reality of pioneering research in physics, and its latest developments and applications. Through classes and laboratories, students acquire operational skills in some of the most advanced experimental and computational technologies, strong problem solving skills, and learn how to build and use mathematical models to analyze complex systems, ensuring a rapid and effective entrance into the job market.

## Course content

Students may choose between three curriculum, 'Experimental Nano- and Bio-Physics', 'Theoretical and Computational Physics', and 'Applied Physics'. Students are guided to set a personalized study plan to meet their interests, and acquire an up-to-date training in several areas of fundamental and applied physics, such as theoretical and computational physics of condensed and soft matter, theoretical physics of fundamental interactions, nanoscience and nanotechnology, and several sectors of applied physics, including physics of biological systems, medical physics, and physics education. A one/two semester original research project will be carried out within one of the Department's research groups, or at partner research centers, possibly also in collaboration with industries of the district.

## Career options

The range of job opportunities for graduates in physics is really wide. Our graduates hold positions in all branches of high-tech industries, including automotive, mechanical, semiconductor and electronics, TLC, and biomedical industries, as well as in areas such as meteorology and environmental monitoring, patent system, medical physics, financial market, scientific publishing, and higher education. A large number of our graduates enroll into a Ph.D. program in Italy or abroad, the starting point to pursue a scientific career in academic research,. Our Department organizes a world connected Doctorate School of Graduate Studies in Physics and Nanoscience. ([www.nano-phdschool.unimore.it](http://www.nano-phdschool.unimore.it))

## How to apply

- Register on the [www.esse3.unimore.it](http://www.esse3.unimore.it) site under the Registration heading and insert the data requested,
- after having obtained the access credentials, do the login and then click on Application for evaluation from the left-hand menu,
- subsequently, to complete the procedure connect to the link as specified in esse3 and in the guide to the application for admission,
- complete the application for evaluation, inserting the information requested.

## Fees and scholarships

min. €600 – max. €2,200. You can apply for the following benefits: 1. A scholarship with total exemption from tuition fees; 2. A reduction of tuition (for those not eligible for total exemption); 3. A financial aid for accommodation and meals. Rules and re-

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requirements for submitting the application are contained in the “Notice of Benefits for Entitlement to Study” (Bando Benefici per il Diritto allo Studio) published by ER.GO: [www.er-go.it](http://www.er-go.it). Incoming students willing to apply for benefits are recommended to contact ER.GO at an early stage of their application to the Master, to be informed on the deadlines. You may also want to contact the International Welcome Desk for guidance on any practical issue, including applications for VISA. Further scholarship opportunities: [studyinitaly.esteri.it/en/home\\_borse](http://studyinitaly.esteri.it/en/home_borse)

## The Department of Physics, Informatics and Mathematics

The Department of Physics, Informatics and Mathematics is a center of excellence for research, teaching and dissemination of the scientific culture. Its main goal is to guarantee an ideal research and training setting to researchers and future professionals in scientific sectors which are crucial for the development of contemporary society. The Department's research activity is funded by a wide number of national and international entities, both in the private and public sectors, and it is conducted in collaboration with many world renowned universities and research centers, both in Italy and abroad. Such high quality partnerships guarantee a range of international research and mobility opportunities also to undergraduates and PhD students. The Department is hosted in a modern building within the Scientific Campus of the University, close and well connected to the historical city center, a UNESCO World Heritage site. On campus services include a canteen, the scientific library and sporting fields. The campus is directly connected to the Bologna International airport (BLQ) by a bus shuttle (about 50 min).

## About UNIMORE

UNIMORE has a longstanding tradition (it was founded in 1175) and is considered one of the best universities in Italy for teaching and research. It is ranked at 2nd among public universities according to Italy's leading financial daily. Over 27,000 students including 3,500 post-graduates, is large enough to offer all the facilities one would expect from a major university (well-stocked libraries, computer rooms, free internet connection and study support services) but small enough to retain a personal and friendly learning environment. Located in the heart of one of Europe's wealthiest and most dynamic regions, which is world-renowned for its production of mechanical parts, engines, sports cars (e.g. Ferrari and Maserati) as well as for its agro-food sector, ceramic tiles and manufacturing industries. UNIMORE benefits from a longstanding relationship with the area's firms and corporations, which provide private support for university research and a unique opportunity for on-the-job training before graduation.



## Contacts

### Programme web page

[www.international.unimore.it](http://www.international.unimore.it)

### Programme coordinator

Prof. Guido Goldoni: [guido.goldoni@unimore.it](mailto:guido.goldoni@unimore.it)

### International Welcome Desk

[internationalwelcomedesk@unimore.it](mailto:internationalwelcomedesk@unimore.it)

### Information Desk

[informastudenti@unimore.it](mailto:informastudenti@unimore.it)



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