OVERVIEW

The Master in Mathematics and Applications

• strengthens knowledge of pure mathematics
• offers three different curricula - one on pure mathematics and mathematics education, a second on applications of mathematics to economics and finance, and a third on applications to technology and engineering
• gives students the option to acquire valuable work experience through internships in businesses or schools.

This Master’s course benefits from the longstanding and widely appreciated educational expertise of its faculty members, notoriously very friendly with their students, and from a wide range of supporting facilities such as communal study spaces, computer services, libraries, as well as dedicated tutoring services. The research experience of faculty members feeds directly into the curriculum, which includes topics related to, for example, the design of electric and racing cars, applications to earth and sea sciences, economics and finance, health (medical diagnostics), assistive robotics (exoskeletons), and much more.

Parallel to the master degree course in Mathematics and Applications, the student can register to the Scuola di Studi Superiori “Carlo Urbani”, an institution of excellence, subject to selection procedure based exclusively on merit. For information visit: https://scuolastudisuperiori.unicam.it

ADMISSION REQUIREMENTS

Bachelor’s degree in mathematics, or in other disciplines as long as including at least 30 ECTS in mathematics and adequate knowledge of algebra, analysis and geometry.

Further information on admission requirements, pre-admission deadlines, and services for international students is available at http://international.unicam.it

CAREER OPPORTUNITIES

• Italian-speaking students interested in teaching may consider a school internship - please contact Prof. Sonia L’Innocente (sonia.linnocente@unicam.it) for further information.
• Students interested in a career in industry (for example involving the development and application of mathematical models for finance, commerce or industry), or in the civil service, are encouraged to visit www.unicam.it/master or to contact directly Prof. Pierluigi Maponi (pierluigi.maponi@unicam.it) or Prof. Carlo Lucheroni (carlo.lucheroni@unicam.it)
• Students interested in academic research are advised to consider the PhD programmes of the UNICAM International School of Advanced Studies - see http://isas.unicam.it for further information.

Lectures are held face-to-face on campus. Remote attendance may be made available through the UNICAM streaming platform, depending on university policy.

All teaching is in English.

COURSE STRUCTURE

Three curricula are available: Pure Mathematics, Mathematics for Industrial Engineering, and Mathematics for Analytics and Finance.

The academic year is divided into two semesters, the first from mid-September to the end of January, and the second from early March to mid-June. The exams periods are the full months of February, June and July, and September.
**Pure Mathematics**

- Advanced Algebra and Mathematical Logic (1st year) 12
- Advanced Geometry I (1st year) 12
- Advanced Mathematical Analysis (1st year) 6
- Calculus of Variations (1st year) 6
- Advanced Applied Mathematics (1st year) 12
- Advanced Probability (1st year) 6
- Free-choice courses 12
- Dissertation (see below) 30

**12 ECTS among the following courses:**

- Knot Theory (2nd year) 6
- Educational Mathematics (2nd year) 6
- History of Mathematics (2nd year) 6
- Revisiting Calculus (2nd year) 6
- General Relativity (2nd year) 6

**12 ECTS among the following courses:**

- Inverse Problems in Remote Sensing Applications (2nd year) 6
- Quantum Computation (2nd year) 6
- Theoretical Physics (2nd year) 6
- Computability and Complexity (2nd year) 6
- Advanced Mathematical Physics (2nd year) 6
- Stochastic Processes (2nd year) 6
- Applied Topology (2nd year) 6
- Embedded Systems Lab for Industry and Education (2nd year) 6

Optional courses

- Free choice credits can include:
  - additional courses in mathematics
  - courses in physics, computer science and other subjects
  - language courses (advanced English or other languages)
  - seminars on mathematics and its applications (in Italian)
  - higher-level apprenticeships (see below).

Students with an undergraduate degree in a subject other than mathematics are advised to use the free-choice ECTS to acquire the necessary background in mathematics. Moreover, they are warmly invited to contact the Course Coordinator to discuss available options.

High Apprenticeship

This is a one-year, on-the-job training programme. To this end, students may use the ECTS reserved for

- optional courses, or
- the final dissertation.

Knowledge of the Italian language is strongly recommended. For information and in order to define a suitable study plan, please contact pierluigi.maponi@unicam.it or carlo.lucheroni@unicam.it well in advance.

**Dissertation**

All students are required to submit a final dissertation, written under the supervision of a faculty member. Students must discuss potential dissertation topics with their chosen advisor well in advance of their expected graduation date.

**QUALITY ASSURANCE SYSTEM UNICAM**

The Quality Management System Certificate ISO 9001:2015 (from AFAQ-France, a French company which is one of the first and most important certification bodies at the global level) guarantees the quality of services provided as part of the course. This certificate is obtained through a rigorous analysis of our internal organizational procedures by AFAQ-France. In this way, any weaknesses or shortcomings are promptly addressed, whether detected by staff or reported by the students themselves. The Quality Management System includes the following support services for students: advice and guidance, mentoring, international mobility, internships, and communication. These services complement educational activities in an ideal way so as to ensure that students develop a broad range of academic and professional skills.