University of Florence (UNIFI), Florence, Italy

Mathematical, Physical and Natural Sciences Faculty

Master's Degree Program in Sciences and Materials for Conservation and Restoration

https://www.scienze-restauro.unifi.it/index.html?newlang=ita

BODY

EDUCATIONAL OBJECTIVES

The course aims to train researchers and experts (conservation scientists) in the field of diagnostics, conservation, and restoration of cultural heritage. To achieve this goal, the educational activities of the study program aim to provide knowledge about the characteristics of the materials that compose cultural heritage, the processes that cause their degradation, and possible remedies. Graduates will be capable of conducting high-level diagnostic interventions while respecting the archaeological, historical-artistic, and architectural context of artifacts.

The main objective of the Master's Degree is to create the professional profile of a 'conservation scientist' who has achieved a high level of methodological and operational proficiency in all scientific techniques applicable to the conservation of cultural heritage, as well as the appropriate skills to participate in the development and design of diagnostic interventions, with a particular focus on identifying methods, materials, measures, and techniques for the recovery, preservation, and restoration of cultural heritage using high-tech methodologies, emphasizing a culture of prevention of future degradation.

These professionals will have the ability to intervene with qualified technical and scientific skills in the process accompanying the conservation and restoration of cultural heritage. Specifically, the professional profile emerging from this program corresponds to what is defined as a conservation scientist in Anglo-Saxon countries, a scientist with excellent multidisciplinary skills in the field of exact sciences (not merely a chemist, physicist, geologist, or biologist for conservation) capable of addressing technical-scientific issues in the field of conservation and restoration interventions on highly complex artifacts.

Unlike a bachelor's degree graduate in class 43 (41 under the old DM509), who is a diagnostic technician capable of conducting investigations and interpreting results in a routine context, the professional profile acquired with this two-year master's program is that of a true scientific leader who plans investigations, interprets results beyond routine levels, and suggests measures to solve conservation and restoration problems not reducible to ordinary execution practices. In this sense, master's degree graduates possess knowledge that can also propel them into the world of advanced scientific research (e.g., participation in doctoral programs) in the field of applied sciences for conservation and restoration.

While referring to the qualifying educational objectives provided in the class declaration, the specific educational objectives of the Master's program and expected learning outcomes can be summarized as follows:

- Knowledge and Understanding: Graduates will acquire knowledge and understanding in the field of advanced scientific diagnostics for the conservation and restoration of cultural heritage, with elements of multidisciplinary culture in archaeology, art history, and architecture, as well as technological disciplines. Scientific disciplines that will enable them to achieve this objective include physics, chemistry, earth sciences, biology, and mathematics, with a strong focus on the applied aspects related to the diagnostics of cultural heritage. In particular, in relation to knowledge and understanding, graduates will: acquire in-depth knowledge of chemistry, physics, mathematics, biology, and earth sciences; acquire specific elements of

historical-artistic, architectural, and archaeological culture; gain complete mastery of the scientific method of investigation and techniques for data analysis and interpretation for the study aimed at the recovery, preservation, and restoration of cultural heritage, even in complex contexts; acquire advanced knowledge of the technical-scientific characteristics and properties of materials constituting cultural heritage. The level attained should enable graduates to understand international peer-reviewed scientific journals on cutting-edge topics in the field of study.

- Applying Knowledge and Understanding: Graduates will be able to apply their knowledge and understanding to a professional approach based on the following points: acquiring the ability to approach complex scientific problems related to the recovery, preservation, enhancement, and use of cultural heritage in a multidisciplinary manner; identifying and critically analyzing methods, materials, measures, and techniques for the recovery, preservation, restoration, and enhancement of cultural heritage; identifying the causes and mechanisms of degradation of cultural heritage and evaluating the scientific results obtained from the investigations conducted; having scientific responsibility for diagnosis, both before and during conservation interventions, as well as necessary checks and testing. In relation to the four points mentioned above, graduates will possess the necessary skills to formulate and support arguments and solve problems in all aspects of science and technology applied to conservation and restoration.

- Making Judgments: Graduates will have the ability to collect and interpret scientific data resulting from laboratory analysis of various types of artifacts that make up cultural heritage in such a way as to be able to make independent judgments that allow them to perform the following functions: high-responsibility roles in scientific museums, "science cities," archaeological parks, scientific exhibitions, etc.; collaboration in the design and implementation of musealization systems for cultural heritage; participation in training activities aimed at creating professional profiles in the field of cultural heritage.

- Communication Skills: Graduates, in addition to being able to communicate the results and information derived from laboratory analysis, will be able to formulate solution hypotheses for all conservation and restoration problems related to materials, intervention techniques, degradation causes, preventive measures, and propose them to the professional figures normally responsible for the protection of cultural heritage.

- Learning Skills: Graduates will develop the learning skills necessary for them to undertake further studies independently in doctoral programs, second-level master's programs, and post-second-level specialization or advanced training schools.

PROFESSIONAL PROFILES

Graduates can engage in professional activities in companies and professional organizations operating in the field of restoration, cultural heritage protection, and environmental recovery, as well as in local authorities and specific institutions such as superintendencies, museums, libraries, archives, public and private research institutes. In particular, they can work at a level of scientific responsibility and coordination, addressing archaeometric or conservation issues related to different types of artifacts and materials. They can also carry out professional activities related to: 1) the evaluation of environmental parameters, such as microclimate control in confined and open environments; 2) the assessment of the state of degradation of artifacts; 3) proposing short- and long-term conservation intervention strategies.

COURSES (AS OF 2023)

First Year Courses

- Molecular Anthropology for Cultural Heritage
- Applied Chemistry with Laboratory
- Mathematical Data Analysis
- Geomaterials with Applications
- Anthropology Laboratory
- Physics Laboratory for Cultural Heritage
- History of Modern Art
- History of Architectural Techniques
- Advanced Optical and Nuclear Techniques with Applications

Second Year Courses

- Professional Development Activities
- Professional Development Activities
- Professional Development Activities
- Professional Development Activities
- Chemistry and Technology of Polymeric Materials
- Chemistry for Cultural Heritage with Laboratory
- Spectroscopic Methods for Cultural Heritage
- Scientific and Naturalistic Museology
- Final Examination: Practical Work
- Final Examination: Report Writing
- Internship

ACCESS REQUIREMENTS

Access to the Master's Degree in Science and Materials for Conservation and Restoration, Class LM-11 of Master's Degrees, is granted to those who hold a bachelor's or undergraduate diploma with a duration of three years. Admission is also open to those who hold another foreign qualification recognized as suitable by the educational institution for admission to the Master's Degree.

To access the Master's Degree in Science for Conservation and Restoration, Class LM-11 of Master's Degrees, the following curricular requirements are also necessary:

At least 30 credits in the following areas: 12 in Chemistry, 6 in Physics, 6 in Geology, and 6 in Mathematics/Informatics.

30 credits in Mathematics, Chemistry, Physics, Geology, Biology, Informatics, Engineering, or equivalent without constraints on individual areas.

18 credits in Ancient Studies, Art Studies, Architecture, or equivalent without constraints on individual areas.

For graduates who meet the above curricular requirements, the adequacy of their preparation will be evaluated by a commission from the Master's Degree program primarily based on the curriculum of studies submitted with the assessment application (click to access the application form). If the curriculum is deemed satisfactory, the Educational Commission approves admission to the Master's Degree program by issuing the required clearance.