UNIVERSITA' DEGLI STUDI DI MILANO
PROGRAMME DESCRIPTION - ACADEMIC YEAR 2022/23
BACHELOR
Science and Technology for Studying and Preserving the Cultural Heritage and Information Storage Media (Classe L-43)
enrolled from 2021/2022 academic year

HEADING

Degree classification - Denomination and code:	L-43 Conservation and restoration of culturale heritage
Degree title:	Dottore
Length of course:	3 years
Total number of credits required to complete programme:	180
Years of course currently available:	1st , 2nd
Access procedures:	Open, subject to completion of self-assessment test prior to enrolment
Course code:	F8X

PERSONS/ROLES

Head of Study Programme
Prof. Luca Trombino

Tutors - Faculty
Tutor per l'orientamento - prof. Giulio Borghini, Prof. ssa Flavia Groppi, prof. Andrea Zerboni
Tutor perla mobilità internazionale e l'Erasmus - Prof. ssa Francesca Cappitelli,
Tutor per i piani di studio:
prof.ssa Silvia Bruni - Orientamento analisi e conservazione dei beni storico-artistici
prof. Andrea Zerboni - Orientamento analisi e conservazione dei beni culturali archeologici
prof. Goffredo Haus - Orientamento analisi, conservazione e restauro dell'informazione e dei supporti informativi
dott. Leonardo Gariboldi - Orientamento analisi e conservazione dei beni museali scientifico-tecnologici
Tutor per stage e tirocini - prof. ssa Elisabetta Onelli
Tutor per laboratori e altra attività - prof.ssa Elisabetta Onelli
Tutor per tesi di Laurea - prof.ssa Elisabetta Onelli
Tutor per tesi di laurea - Dott.ssa Bonizzoni Letizia
Tutor per trasferimenti - prof. Marco Merlini
Tutor per ammissioni Lauree Magistrali - prof. Luca Trombino
Tutor per riconoscimento crediti - Prof. Marco Merlini

Degree Course website
https://conservazionebeniculturali.cdl.unimi.it/it
Via Luigi Mangiagalli, 34 II piano   Quando disponibile o su appuntamento   Email: luca.trombino@unimi.it

course management
Ufficio per la Didattica, al momento solo via email scrivendo: sportello.beniculturali@unimi.it   Email: sportello.beniculturali@unimi.it

Libraries
https://www.unimi.it/it/studiare/biblioteche

Student registrar
Via Celoria, 18 - 20133 Milano   Phone 0250325032   https://www.unimi.it/it/node/360   https://www.unimi.it/it/node/359

CHARACTERISTICS OF DEGREE PROGRAMME

General and specific learning objectives
This bachelor program is devoted to train up scientific professionals specialized for Studying and Preserving the Cultural Heritage and Information Storage Media.
People who get this bachelor's degree have specific methodological, scientific, and technological knowledge needed for:
- evaluating the state of preservation of cultural heritage, its morphological-structural characteristics, and the properties of its constituting materials;
- the identification, risks' evaluation, diagnosis and rescuing actions for avoiding deterioration processes in cultural heritage

with respect to archaeological sites, historical-artistic artifacts, museum collections, information storage media and related contents;
- restoring of information storage media and related contents;
- taking the scientific-technological leadership of institutions and professional organizations devoted to the preservation, management, and maintenance of cultural heritage, and also of private professional organizations devoted to conservative restoration and environmental rescuing;
- being able to exchange professional oral and written information in at least a couple of European languages (tipically italian and english);
- doing operative actions for the communication, preservation, fruition, and management of information concerning cultural heritage;
- working in the frame of a team, with a high level of autonomy, easily joining a working environment.
A robust basic scientific education is coupled to this specialistic qualification, so that students acquire fundamental scientific and professional methodologies.

Expected learning outcomes

KNOWLEDGE AND UNDERSTANDING
Graduates of the degree course in 'Science and Technology for Studying and Preserving the Cultural Heritage and Information Storage Media' will have theoretical and operational knowledge and skills in the following fields:
- biology, chemistry, physics, geology, computer science, all applied to cultural heritage;
- analysis and conservation of archaeological, historical-artistic, scientific-technological cultural heritage, as well as information and information storage media;
- foundations of law and statistics.
Expected learning outcomes:
- knowledge of conceptual methods, principles and systems, for studying and preserving cultural heritage and information storage media;
- knowledge of analytical and diagnostic methods and tools aimed at the preservation of cultural heritage and information storage media;
- understanding and controlling main tools and methods (both quantitative and qualitative) for the preservation of cultural heritage and information storage media;
- knowledge of the main research results and the most important theoretical developments in one or more disciplinary sub-areas and related research fields.

APPLYING KNOWLEDGE AND UNDERSTANDING
Graduates of the course must be able to apply the multidisciplinary knowledge and skills acquired for the analysis, preservation, digitization and use of the different types of cultural heritage, both as regards the methodological and the technological/instrumental aspects; reference is made to the following types of cultural heritage: archaeological, historical-artistic, scientific-technological, as well as information and information storage media.
They must also be able to apply the cognitive tools acquired during their graduation path, to the study, classification, diagnostic, methodological design, of interventions aimed to preserving and developing cultural heritage; the areas of application will be local authorities and specific institutions for cultural heritage, museums, libraries, archives, as well as companies and professional organizations operating in the fields of archaeological excavation, restoration, protection of cultural heritage, information and related storage media.
Expected learning outcomes:
- knowledge of a wide spectrum of application areas of the study and preservation of cultural heritage together with the solutions adopted in those areas;
- ability to logically analyse specific problems related to the study and conservation of cultural heritage and information storage media, the solution of which requires the use of scientific-technological tools and the choice of appropriate methods;
- ability to analyse and plan interventions relating to the various types of cultural heritage, even of considerable complexity both in terms of quantity and quality of the considered cultural heritage;
- ability to collect, evaluate and analyse empirical evidence regarding the state of both knowledge and preservation regarding cultural heritage and information storage media;
- ability to provide systematic bibliographic references consistent with the conventions accepted by the scientific community.

MAKING JUDGEMENTS
Graduates of the course must acquire a full capacity to formulate autonomous and aware judgments, regarding the analytical, diagnostic, and planning, decisions and choices of the authorities, institutions, organizations and companies in which they will be operating, with particular reference to:
- study and evaluation of the state of conservation and survey planning of cultural heritage;
- assessment of risks, interventions and diagnostics aimed at the prevention and outage of degradation and instability processes of archaeological sites and artefacts, historical and artistic artefacts, and information storage media, as well as their related information content.
They will also have to fully assimilate the principles of professional ethics that guide interpersonal relationships in the occupational context in which they will operate after graduation.
Expected learning outcomes:

- ability to critically ratiocinate and discuss the choice of methods and tools for studying and preserving cultural heritage and information storage media;
- ability to develop autonomous and independent arguments and reflections;
- awareness of the existence of alternative methodological approaches for analysing and preserving the cultural heritage and the information storage media; understanding of the relevance of such plurality;
- ability to critically assess the relevance, characteristics and costs of alternative interventions for studying and/or preserving cultural heritage;
- Ability to critically evaluate and interpret evidences.

COMMUNICATION SKILLS
Graduates of the course must acquire adequate communication skills and tools with reference to: written and oral communication in Italian and foreign (English) languages; computer skills, data processing and presentation; ability to work in a team; transmission and dissemination of information on cultural heritage issues, their study and preservation.
Graduates of the course must be able to argue their positions and communicate the results of their analyses and assessments in a clear and effective way, using the most common working language in the international working contexts (English) and making use of the most up-to-date scientific and most advanced technological tools (chemical-physical, geological, biological, IT, mathematical-statistical, economic-legal) for studying and preserving cultural heritage and information storage media.
Expected learning outcomes:
- written communication skills, based on the use of appropriate terminology and technical-scientific language;
-ability to present, in written form, clear, coherent, and concise technical and methodological ideas and critically evaluated arguments;
- ability to formulate and express, in oral form, even in public contexts, complex arguments in the technical and methodological field;
- ability to elaborate, in an accomplished and coherent way, an original research dissertation on a complex topic, through the use of appropriate technological supports.

LEARNING SKILLS
The graduation course aims to lead its students, albeit gradually, to the frontier of scientific-technological knowledge in the disciplinary and interdisciplinary fields of reference. For this reason, the course aims to firstly favour the development of learning skills by their students, as well as the acquisition of methodological and theoretical competences in order to undertake autonomously in-depth activities and scientific-technological methods according to international standards. This latter also in order to a possible prosecution of studies in the master degree related to cultural heritage.
Expected learning outcomes:
- ability to organize critically and systematically one's own ideas;
- ability to identify, select and collect information through the appropriate use of the relevant sources;
- ability to use libraries, databases, paper and electronic archives and repertories, to access relevant scientific and documentary information, also for the purpose of continuous updating knowledge;
- ability to organize and implement an independent study plan;
- ability to reflect on one's own learning experience and to adapt it in response to suggestions and motivations from teachers or colleagues;
- ability to recognize the need for further studies and to appreciate the innovative learning modalities and additional research activities."
- ability to design and develop independent research work, albeit led by a supervisor.

Professional profile and employment opportunities
People who get the bachelor's degree in Science and Technology for Studying and Preserving the Cultural Heritage and Information Storage Media will conduct their professional activities for public and private institutions whose focus is on cultural heritage such as museums, libraries, archives, and also for professional companies working in the fields of archaelogical excavations, preservation and restoring of cultural heritage , information, and related storage media.
Specific roles and professional skills of people who get the bachelor's degree in Science and Technology for Studying and Preserving the Cultural Heritage and Information Storage Media, are only partially considered in the classification made by ISTAT, and particularly they are somewhat close to PROFESSIONI INTELLETTUALI, SCIENTIFICHE E DI ELEVATA SPECIALIZZAZIONE (2.5.4.5, 2.5.5.1.3); the main reason follows from the recent definition of new professional figures concerning Science and Technology for Studying and Preserving the Cultural Heritage and Information Storage Media.
This bachelor program is devoted to train up professional figures such as:
- experts in geoarchaelogy and archaeometry, skilled for the study, diagnosis, and preservation of archaelogical sites and artifacts, and also for supporting excavations' activities;
- experts in the application of analytical techniques for supporting historical-philological studies, characterizing materials and the causes of their degradation state, and defining needed rescuing actions;
- experts specialized in the exploitation of historical, scientific, technological, naturalistic cultural heritage: they will be able in understanding, diagnosis, preserving, managing, cataloguing, digitazing, exploitation, and cultural promotion;
- experts in the analysis of the preservation state, in the definition and application of the more efficient techniques for preserving, organizing, exploiting, and restoring of both information storage media (analogue and digital) and the related information contents.

Initial knowledge required

Admission to the Degree Programme in Science and technology for the study and conservation of cultural heritage and information media is open, with a mandatory non-selective test prior to enrolment.

Candidates will have to sit for the TOLC (Test Online CISIA) at the University of Milan or any other member university of CISIA (Consortium of Inter-University Integrated Access Systems). Register to the TOLC test on the CISIA website (www.cisiaonline.it).

The TOLC tests providing access to the Degree Programme in Science and technology for the study and conservation of cultural heritage and information media are TOLC-S and TOLC-B.

Only after taking one of these tests, will you be able to enrol, WHATEVER THE RESULT:

- TOLC-S, divided into 4 sections: Basic mathematics (20 questions - 50 minutes), Reasoning and problems (10 questions - 20 minutes), Reading comprehension (10 questions - 20 minutes), Basic sciences (10 questions - 20 minutes).

- TOLC-B divided into 4 sections: Basic mathematics (20 questions - 50 minutes), Biology (10 questions - 20 minutes), Physics (10 questions - 20 minutes), Chemistry (10 questions - 20 minutes).

Each question has 5 answer options, of which only one is correct.

Score: +1 for a correct answer, -0.25 for a wrong answer, 0 for a no answer.

Students who have not achieved at least 10 points in the Mathematics module will have to fulfil additional learning requirements (OFA).

Each TOLC test includes an additional English section, consisting of 30 questions to be answered in 15 minutes. This section does not count toward the overall test score.

Remedial activities and tests: https://conservazionebeniculturali.cdl.unimi.it/it/studiare/le-matricole

Students with additional learning requirements will have to carry out remedial activities organised by the University in the period October-December, and then take a test to prove they have filled their gaps. Otherwise, they may not take any second-year or optional exams before passing the General Mathematics exam.

Test structure and topics, registration procedures, dates, deadlines and any other useful information are set out in the call for applications.

See also https://www.unimi.it/en/study/bachelor-and-master-study/degree-programme-enrolment/enrolment-first-degree-programme

Admission of transfer or graduate students

Transfer students from a degree programme of the University of Milan, or another university, and graduate students will be waived from the test requirement only if admitted to years subsequent to Year I.

To this end, they will have to submit a specific request for prior assessment of their academic records using the online service as shown in the call for applications.

These candidates must provide a full transcript of records (listing exams, subject areas, credits, grades) and attach the course syllabi. For more details, please refer to the call for applications.

For the deadlines for applying for academic records assessments, please refer to the call.

The outcome will be notified via e-mail.

Students admitted to the first year will be required to take the test.

Compulsory attendance

Attendance is strongly recommended for both courses and laboratories.

Internship criteria

Training is completed by two distinct activities:

- an internship to be carried out at one or more University laboratories/facilities, public or private institutions, or professional associations in Italy or abroad, for a total of 8 credits;

- a traineeship that preferably involves an experimental activity, to be carried out at University laboratories/facilities, public or private institutions, or professional associations in Italy or abroad, for a total of 10 credits.

You can contact the internship board for assistance with internship/traineeship selection.

Students wishing to undertake an internship/traineeship off campus must submit an application to the board for approval, with the following information:

- Host institution

- Names and qualifications of the external tutor and internal tutor (thesis supervisor)

- Internship/traineeship start and end dates

- Description of the activity to be carried out

The application will be submitted to the Departmental Academic Board for approval.

After obtaining the approval, the student must contact COSP for internship/traineeship formalities.

Degree programme final exams

Upcoming graduates must pass a final exam, which consists in the discussion of a comprehensive report (final paper) written by the student.

The final paper to be discussed during the final degree exam will cover traineeship activities and the resulting skills. The

report, to be approved by a faculty member for the degree programme, must be an original paper showing the student's ability to independently structure their work, including the analysis and diagnosis of Cultural Heritage conservation issues.

For the student to be admitted to the final exam, they must: a) have obtained 174 CFU, including 3 CFU for English language proficiency, 8 CFU for an internship and 10 CFU for a traineeship; b) have written a final paper. By writing and defending the final paper, the student may earn an additional 6 credits.

https://www.unimi.it/en/study/bachelor-and-master-study/graduation

Campus

Lessons take place in the Città Studi classrooms (check the lessons timetable for classroom location, or check the App "La Statale").

Laboratories

Teaching laboratories take place both in departmental structures, equipped with technical-scientific instruments and collections, and on-field, using customised logistics solutions.

Activities in equipped laboratories take place in the following Departments: Department of Earth Sciences, Department of Chemistry, Department of Food, Environmental and Nutritional Sciences (Faculty of Agricultural and Food Sciences), Department of Physics, Department of Computer Science.

Notes

In order to obtain their degree, students must be proficient in English at a B1 level under the Common European Framework of Reference for Languages (CEFR). This proficiency level may be certified as follows:

- Through a language certificate, earned within three years prior to the date of submission, at a B1 level or higher. For the list of language certificates recognised by the University, please review: https://www.unimi.it/en/node/297/). The certificate must be uploaded during the enrolment procedure, or subsequently to the portal http://studente.unimi.it/uploadCertificazioniLingue;

- Through a Placement Test, which is delivered by the University Language Centre (SLAM) during year I only, from October to December. Students who fail the test will be required to take a SLAM course.

The Placement Test is mandatory for all students who do not hold a valid certificate.

Those who do not sit the Placement Test by December, or who fail to pass the end-of-course test within six attempts, must obtain a paid certificate by graduation.

EXPERIENCE OF STUDY ABROAD AS PART OF THE TRAINING PROGRAM

The University of Milan supports international mobility by providing its students with the opportunity to spend study and internship periods abroad. It is a unique chance to enrich your educational path in a new exciting environment.

The agreements entered into by the University with over 300 universities from the 27 EU member countries and other Extra-EU countries under the European Erasmus+ programme allow regularly enrolled students to carry out part of their studies at one of the partner universities or to undertake internships at companies, training and research centres and other organizations.

Similar international mobility opportunities are provided outside Europe, through agreements with a number of prestigious institutions.

Study and internships abroad

Erasmus is a grant that finances the study abroad experience at a partner university, as part of bilateral agreements with selected universities and research centers in many foreign countries. When abroad, students attend courses, carry out research activities or do an internship.

In order to get these grants, students must contact a professor of this program who will scientifically supervise the exchange. Every topic related to this program is suitable. Two types of grants are available:

Erasmus+, for attending courses and carry out research activities (refer to the call in the Geological Sciences area).

Erasmus+ Traineeship, exclusively for internships.

For Erasmus+, see the call on the Geology area in the unimi.it website. Among other agreements, please have a look at the undergraduate and graduate courses offered by TEI, Technological Educational Institute, Atene (Grecia), who has a special agreement with this program.

The call for Erasmus+ Traineeship is published on the unimi.it website for all programs. In the recent past, Traineeship partners were: Cergy-Pontoise (France), Poitiers (France), Santiago de Compostela (Spain) and Ghent (Belgium). Anyway, new agreements with other universities or research centers can be signed if a professor of this program has some scientific collaboration with them. Apart from courses and exams, any activity carried out at the abroad institution is worth 3 credits (CFU) per month.

The "learning agreement" between professors at the home and abroad institution will define the activities the student will carry out. This document, together with the transcript of the exams and other research activities, will allow for the acknowledgment of such activities by this program.

To attend courses and take exams abroad has many advantages. In addition to being an unconventional experience in a student's life, it offers a big opportunity to practice in the local language. The students will also experience and compare different teaching systems, gaining more flexibility in their studying activities. Finally, the study abroad experience is in

some cases a good opportunity to use facilities otherwise not available (for example, special equipment for experiments), work with large research groups on a cosmopolitan scale.

How to participate in Erasmus mobility programs

How to participate in Erasmus+ mobility programmes

The students of the University of Milan can participate in mobility programmes, through a public selection procedure.
Ad hoc commissions will evaluate:
• Academic career
• the candidate's proposed study programme abroad
• his/her foreign language proficiency
• the reasons behind his/her application

Call for applications and informative meetings
The public selection generally begins around February each year with the publication of a call for applications specifying the destinations, with the respective programme duration (from 2/3 to 12 months), requirements and online application deadline.

Every year, before the deadline for the call, the University organizes informative meetings to illustrate opportunities and rules for participation to students.

Erasmus+ scholarship
The European Union grants the winners of the Erasmus+ programme selection a scholarship to contribute to their mobility costs, which is supplemented by the University funding for disadvantaged students.

Language courses
Students who pass the selections for mobility programmes can benefit from intensive foreign language courses offered each year by the University Language Centre (SLAM).
https://www.unimi.it/en/node/8/

Learn more at https://www.unimi.it/en/node/274/

For assistance, please contact:
International Mobility Office
Via Santa Sofia 9 (second floor)
Tel. 02 503 13501-12589-13495-13502
Contacts: InformaStudenti mobility.out@unimi.it
Student Desk booking through InformaStudenti

1st COURSE YEAR Core/compulsory courses/activities common

Learning activity	Ects	Sector
ELEMENTS OF MINERALOGY AND PETROGRAPHY	6	GEO/06, GEO/07
English assessment B1 (3 ECTS)	3	ND
GENERAL AND INORGANIC CHEMISTRY	6	CHIM/03
GENERAL COMPUTER SCIENCE	12	INF/01
GENERAL MATHEMATICS	6	MAT/09, MAT/01, MAT/02, MAT/03, MAT/04, MAT/05, MAT/06, MAT/07, MAT/08
GENERAL PHYSICS	6	FIS/01
LAW FOR CULTURAL HERITAGE	6	IUS/10
METHODOLOGY OF THE ARCHAEOLOGICAL RESEARCH	12	L-ANT/10
PLANT BIOLOGY	6	BIO/02
PROBABILISTIC AND STATISTIC METHODS	6	SECS-S/01
Total compulsory credits	69	

2nd COURSE YEAR Core/compulsory courses/activities common

Learning activity	Ects	Sector
ANALYSIS METHODS FOR CULTURAL GOODS	9	FIS/07
ANALYTICAL CHEMISTRY	9	CHIM/12, CHIM/01
Cultural Heritage Microbiology	6	AGR/16
PALEONTOLOGY AND STRATIGRAPHIC GEOLOGY	6	GEO/02, GEO/01
RESTORATION OF CULTURAL HERITAGE	6	ICAR/19
Total compulsory credits	36	

3rd COURSE YEAR (available as of academic year 2023/24) Core/compulsory courses/activities common

Learning activity	Ects	Sector
TRAINING	10	NA
	Total compulsory credits	10	

COURSE YEAR UNDEFINED Core/compulsory courses/activities common

Learning activity	Ects	Sector
STAGE	8	NA
	Total compulsory credits	8	

Further elective courses

	Ects	Sector
ANTHROPOLOGY	6	BIO/08
ARCHAEOMETALLURGY	6	ING-IND/23
ARCHAEOZOOLOGY	9	BIO/05
ARCHIVAL STUDIES	6	M-STO/08
CHEMICAL AND PHYSICAL METHODS FOR THE CULTURAL GOODS CONSERVATION	9	CHIM/02
CHEMISTRY OF MATERIALS	6	CHIM/05, ING-IND/23
CONTEMPORARY MUSEOLOGY	6	ING-IND/23, L-ART/04
ELEMENTS OF OPTICS AND NUCLEAR PHYSICS	9	FIS/04, FIS/03
ENTOMOLOGY FOR CULTURAL GOODS	6	AGR/11
GEOARCHAEOLOGY AND QUATERNARY GEOLOGY	6	GEO/04
HISTORY OF TECHNOLOGY	9	FIS/08
Methods and languages for data management	6	INF/01
MULTIMEDIAL TECHA ORGANIZATION AND DIGITALIZATION	6	INF/01
NON-DESTRUCTIVE ANALYSES	6	ING-IND/23
ORGANIC CHEMISTRY	9	CHIM/06
X-RAY METHODOLOGIES FOR CULTURAL GOODS	6	FIS/04, FIS/03

End of course requirements

	Ects	Sector
FINAL EXAM	6	NA
	Total compulsory credits	6	

COURSE PROGRESSION REQUIREMENTS

The program of each course indicates the preliminary knowledge necessary to adequately deal with the contents of the course itself. It is the responsibility, as well as the interest, of the student to comply with these indications.