UNIVERSITA' DEGLI STUDI DI MILANO
PROGRAMME DESCRIPTION - ACADEMIC YEAR 2022/23
BACHELOR
Natural Sciences (Classe L-32)
enrolled from 2018/2019 academic year

HEADING	
Degree classification - Denomination and code:	L-32 Environmental sciences
Degree title:	Dottore
Length of course:	3 years
Total number of credits required to complete programme:	180
Years of course currently available:	1st , 2nd , 3rd
Access procedures:	Cap on student, student selection based on entrance test
Course code:	F66

PERSONS/ROLES

Head of Interdepartmental Study Programme
Prof.ssa Lucia Angiolini

Degree Course Coordinator
Prof.ssa Lucia Angiolini

Tutors - Faculty
Tutor orientamento e piani di studio - Maria Rose Petrizzo, Diego Rubolini, Roberta Pennati, Claudio Olivari, Paolo Tremolada, Carlo Polidori, Cristina Bonza, Morena Casartelli, Nicoletta Marinoni, Marco Caccianiga
Tutor per la mobilità internazionale e l'Erasmus - Morena Casartelli
Tutor per stage e tirocini - Alessandra Moscatelli
Tutor per trasferimenti - Morena Casartelli
Tutor per riconoscimento crediti - Cristina Bonza

Degree Course website
https://scienzenaturali.cdl.unimi.it/it
via Luigi Mangiagalli 34 (primo piano) Email: lucia.angiolini@unimi.it

Course management
via Botticelli, 23 Email: cclsn@unimi.it

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

Student registrar
via Celoria 18 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
Aim of this course is to offer a balanced synthesys of knowledge and methods both in the biologic area and in the earth-sciences, which are the bases for professional activities concerning the interpretation and the protection of the recent natural world and its past evolution, focusing specifically on the correlation between organisms, substrate and environment.
The course is aimed to provide the students with an exhaustive learning of the natural world as well as the experimentation of the scientific method for the study of the biologic components, their mutual interactions, and their interactions with the physical environment; it will prepare graduates which will be able to correctly interpret both the biotic and abiotic factors of the environment and their interactions. The studies are widely multidisciplinary, ranging from biology to geology and to geography, with robust bases of chemistry and physics.

Expected learning outcomes
Graduates are expected to acquire:

A: knowledge and understanding:

- knowledge of the fundamentals of mathematics, statistics, computer science, physics and chemistry aimed at the acquisition of the basic features of the disciplines to be used in different working areas and/or during the continuation of the studies (Master);
- knowledge of biological disciplines to understand the diversity of living organisms, their organization and the mechanisms underlying their functioning, also in an evolutionary framework;
- knowledge of ecological disciplines to understand the relationships between plants and animals and the environment in which they live;
- knowledge of the disciplines of Earth Sciences to understance the processes acting on our planet both in the present and in the geological past;
- knowledge of agricultural, management and communication disciplines for the acquisition of fundamental skills for land management in natural and man-made contexts and for understanding and interpreting the natural world in its biotic and abiotic component.

B: application skills:
- ability to process naturalistic data using mathematical and statistical techniques and to apply basic analytical techniques to the different contexts of the natural sciences.
- ability to identify living organisms, the nature of the substrate and the shapes of the landscape, to interpret and use topographic maps for the analysis of the territory, and to process these elements through geographic information systems, to plan protocols and experimental procedures, to apply them , and write reports in the different areas of Natural Sciences, such as surveys and analysis of the vegetation, fauna and geomorphology, or methodological and experimental procedures for the analyses of living organisms and the environment in the present and in the geological past.

C: autonomy of judgment:
- ability to evaluate and interpret experimental data;
- ability to use appropriate laboratory and field safety tools;
- ability to choose the appropriate techniques for analyzing the components of the environment;
- ability to apply the principles of professional ethics and the scientific approach to bioethical issues.

D: communication skills:
- ability to communicate orally and in writing with a public of experts and with a general public, using language-appropriate registers to each circumstance;
- ability to use different IT tools with their main applications;
- ability to work in a team and to operate independently.

E: ability to learn:
- knowledge of scientific updating tools for the Natural Sciences disciplines;
- ability to consult databases;
- ability to access scientific literature produced in at least one European language in addition to one's own.

Professional profile and employment opportunities

The course is aimed to prepare graduates who could have access to works with technical and professional functions in surveys and in the analysis, classification, preservation and recovery of the biotic components of the aquatic and terrestrial ecosystems. These activities could be carried out in parks, natural reserves, museums, and teaching institutions. Graduates in this discipline could also be employed in the analysis and monitoring of systems and biological processes both in natural settings and in anthropic ones, in order to preserve the natural environment, to check and ameliorate its quality, to identify and protect the natural and cultural heritage.

Initial knowledge required

Admission to the three-year degree course in Natural Sciences is open to candidates with a high school diploma or equivalent foreign qualification in accordance with Ministerial Decree no. 270 of 22 October 2004. The degree course in Natural Sciences has a limited number of places in order to guarantee the quality of the teaching offer in relation to the available resources and provides for a TOLC (Test On Line CISIA) as an admission test. There are 300 places available for enrolment in the first year.
The TOLC can be taken at the University of Milan or at any other university adherent to CISIA (Consorzio Interuniversitario Sistemi Integrati per l'Accesso). Registration for the TOLC can be made on the CISIA website (ww.cisiaonline.it). The TOLC valid for enrolment in the Natural Sciences degree course is the TOLC-S, consisting of the following sections: Basic Mathematics (20 questions - 50 minutes), Reasoning and Problems (10 questions - 20 minutes), Text Comprehension (10 questions - 10 minutes), Basic Sciences (10 questions - 20 minutes). Each question has 5 possible answers, of which only one is correct. Scoring: +1 for each correct answer, -0.25 for each wrong answer, 0 for each answer not given in the other sections.
The structure and topics of the test are published at https://www.cisiaonline.it/en/area-tematica-tolc-scienze/struttura-della-prova-e-syllabus/.
The entry requirements and the call for applications are available at https://scienzenaturali.cdl.unimi.it/it/iscriversi.

Students who have taken the TOLC-S will be enrolled in the selection for admission to the degree course in Natural Sciences, and will be placed in the merit list, drawn up on the basis of the scores obtained in the test. The winners will be

able to enrol within the deadlines indicated in the announcement. Freshmen who do not achieve a score greater than or equal to 10 in the Mathematics module will be assigned Additional Educational Obligations (OFA). In the TOLC-S there is an additional section of English, consisting of 30 questions to be completed in 15 minutes, the result of which does not count towards the test score.

Access by transfer or for students who have already graduated.
Students already enrolled in a degree course at the University of Milan, at another university or already graduated, may be exempted from the test only if they are admitted to years other than the first, but only if they meet the minimum requirements, i.e. at least 30 CFU recognisable as exams of the degree course, of which 12 can be validated for the Institutions of Mathematics and Statistics exam.
To this end, a request for prior career evaluation must be submitted by accessing the online service indicated in the call for admission.
Applicants must declare all the exams they have taken with the corresponding sectors, credits and grades and attach the course programmes. For further details on the procedure, dates and deadlines, please refer to the call for applications.
Students admitted to the first year must take the test and register for the call.

Support activities and remedial tests.
Support activities will be organised for students with OFA, followed by a recovery test in which the student must demonstrate that he/she has improved his/her preparation. In the absence of this evidence, the student will not be able to take any exam of the second year before having passed the Institutions of Mathematics and Statistics exam (link: https://scienzenaturali.cdl.unimi.it/en/studiare/le-matricole).
Information on how to enrol in the degree course is available at https://www.unimi.it/en/study/bachelor-and-master-study/degree-programme-enrolment/enrolment-first-degree-programme.

Compulsory attendance

Attendance to didactic activitites including laboratories, field activities, internships which provide credits, is compulsory.

Degree programme final exams

The Final Exam consists of a presentation and discussion of a written report related to experimental activities. This report plays a foundamental teaching role necessary that completes the 3-years individual study programme. No particular originality of development is required and its preparation must commensurate with the number of 4 CFU assigned to it by the regulations.
The Final Exam can be taken in english, as well as the drafting of the corresponding paper.

In order to be admitted to the final exam students must have acquired 176 credits, including those required for the foreign language.

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

Campus

Course locations: Department of Biosciences (via Celoria 26), Settore Didattico (via Celoria 20, via Golgi 19, via Venezian 14), Department of Earth Sciences "Ardito Desio" (via Mangiagalli 34 e via Botticelli 23) and other classrooms situated in different buildings in Milan-Città Studi.

Laboratories

Laboratory locations: Department of Biosciences (via Celoria 26), Settore Didattico (via Celoria 20, via Golgi 19, via Venezian 14), Department of Earth Sciences "Ardito Desio" (via Mangiagalli 34 e via Botticelli 23)

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 certification, earned within three years prior to the date of submission, at a B1 level or higher. For the list of language certifications recognised by the University, please review: https://www.unimi.it/en/node/297/). The certification 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 certification.
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 an outside paid certification 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

As part of the ERASMUS + program, agreements have been made with Danish, Spanish, French and Romanian universities for students enrolled in the Bachelor's Degree in Natural Sciences. During the study period abroad the students can attend courses and take the related exams, and carry out research for the degree thesis. Students admitted to the mobility program must submit a study plan proposal that includes the training activities they plan to carry out abroad. The number of CFU of the proposed plan must, as far as possible, correspond to what the student would acquire in an equivalent period of time at his university. The proposed activities, chosen as part of the host university's educational activities, must be consistent with the educational project of the degree course. The study plan must be submitted for approval to the Erasmus Commission of the Collegio Didattico Interdipartimentale. The Commission may ask the student to integrate the program of an exam taken in the host university with an interview to be carried out in the University of Milano on an agreed supplementary program. At the end of the mobility program, in compliance with the University guidelines, the exams passed in the approved study plan will be recorded in the student's career with the original name of the course in the host foreign university, and their ECTS converted into CFU and the vote expressed in thirtieths.

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.

Learn more at https://www.unimi.it/en/international/study-abroad/studying-abroad-erasmus

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**
Botany	12	(6) BIO/02, (6) BIO/01
Chemistry	10	CHIM/03, CHIM/06
English assessment B1 (2 ECTS)	2	ND
Fundamental of mathematics and statistics	12	MAT/09, MAT/01, MAT/02, MAT/03, MAT/04, MAT/05,

			MAT/06, MAT/07, MAT/08
General and environmental biology with elements of Histology		8	BIO/06
Physical geography and cartography		8	GEO/04
Physics		6	FIS/08, FIS/07, FIS/06, FIS/05, FIS/04, FIS/03, FIS/02, FIS/01
Zoology		12	BIO/05
	Total compulsory credits	70	

2nd COURSE YEAR Core/compulsory courses/activities common

Learning activity		Ects	Sector
Comparative anatomy		7	BIO/06, BIO/16
Ecology and behavioural ecology		15	BIO/07
General and environmental physiology		8	BIO/09
Genetics		8	BIO/18
Geology		6	GEO/02
Mineralogy		6	GEO/06
Paleontology		6	GEO/01
Petrography		6	GEO/07
	Total compulsory credits	62	

3rd COURSE YEAR Core/compulsory courses/activities common

Learning activity		Ects	Sector
Evolutionary biology		6	BIO/19, BIO/18, BIO/05, BIO/02
Final exam		4	ND
Geographic Information Systems		6	INF/01
	Total compulsory credits	16	

Elective courses

Anthropology and archaeological excavation		6	BIO/08
Climatology		6	GEO/04
Developmental biology		6	BIO/06, BIO/01
Environmental microbiology		6	BIO/19
Freshwater biology		6	BIO/05
General entomology		6	AGR/11
Geobotany		6	BIO/02
Geomorphology		6	GEO/04
Geopedology		6	GEO/04
Mineral resources and environmental interactions		6	GEO/09
Nature conservation		6	BIO/07
Paleontology heritage and excavations		6	GEO/01
Plant physiology		6	BIO/04
Quaternary climate changes		6	GEO/02
Vertebrate zoology		6	BIO/05

COURSE YEAR UNDEFINED Core/compulsory courses/activities common

Learning activity		Ects	Sector
Field activity, training activity and laboratories		8	ND
	Total compulsory credits	8	

COURSE PROGRESSION REQUIREMENTS

Petrography exam must be preceded by the Mineralogy one.

Learning activity	Prescribed foundation courses	O/S
Petrography	Mineralogy	Core/compulsory