UNIVERSITA' DEGLI STUDI DI MILANO
PROGRAMME DESCRIPTION - ACADEMIC YEAR 2020/21
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 - Cristina Bonza, Morena Casartelli, Nicoletta Marinoni, Claudio Olivari, Roberta Pennati, Diego Rubolini, Paolo Tremolada
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

via Botticelli, 23 Email: cclsn@unimi.it

via Celoria 18 Phone 0250325032 https://www.unimi.it/it/node/360 https://www.unimi.it/it/node/359/

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

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.

Notes

To obtain the degree, students are required to demonstrate an English language proficiency at level B1 within the Common European Framework of Reference for Languages (CEFR). This level can be assessed in the following ways:
- by submitting the language certificate achieved no more than three years prior to the submission, at level B1 or higher, recognised by the University (the list of recognised language certificates can be found at: https://www.unimi.it/en/node/297/). The language certificate must be uploaded during the admission process;
- by taking the Placement Test, organised by SLAM exclusively during the first year, from October to December. Students who fail to reach level B1 or B2 will have to attend an English course organised by SLAM. The Placement Test is compulsory for all students who do not have a valid language certificate.

Students who do not take the Placement Test within the deadline and students who fail the SLAM end-of-course test within six attempts will have to obtain a language certificate within the year in which the language exam is scheduled.

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 30 different 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 Spanish, French and Romanian universities for students enrolled in the Bachelor's Degree in Natural Sciences. Diring 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, which last 3 to 12 months, through a public selection procedure.
Ad hoc commissions will evaluate:
• 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, 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
Responsible for Natural Sciences: prof. Morena Casartelli

For assistance, please contact:
International Mobility Office
Via Santa Sofia 9 (second floor)
Tel. 02 503 13501-12589-13495-13502
E-mail: mobility.out@unimi.it
Desk opening hours: Monday to Friday 9 am - 12 noon

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
Vascular plants		6	BIO/02, BIO/01
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

The course contains the following obligatory or advised prerequisites

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